

Diversity, Endowments and Inclusion: Pay-for-Performance and Gender Differences in University Presidents Base Salaries

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Abstract: This study investigates gender disparities in base salaries among university presidents, focusing on how endowment levels affect gender-based pay-for-performance differences. Pay-for-performance links compensation to performance outcomes. Using ordinary least-squares, quantile regression, and the Generalised Linear Model, we analyse data from 422 colleges and universities. Results show that while endowment sizes for male and female presidents are similar, an additional \$1 billion increases female presidents' average base salary by 10%, with little to no impact on male presidents' salaries. This financial sensitivity may lead female presidents to avoid financial risks and suggests they may face different financial expectations than their male counterparts. Control variables allow for examining gender pay disparities across six institutional categories, linking president salaries to institutional diversity, high-potential women pay premiums, operational scale economies, teaching and research trade-offs, and wage optimisation.

Keywords: Gender Disparities, University Presidents, Pay-for-performance, Endowments, Salary, Higher Education, Regression Analysis.

1. Introduction

Despite progress in women's labor market outcomes, significant gaps in earnings and leadership persist, and numerous initiatives to close them have had limited success (Macis, 2017)). The enduring nature of these disparities suggests a complex interplay of economic forces, cultural and social norms, discrimination, and unequal legal rights (Macis, 2017). The gender pay gap is a well-documented issue in higher education, affecting both faculty and administrators in private and public institutions. Research consistently shows that women in academia earn less than their male counterparts, even when accounting for factors such as rank, experience, and field of study (Blevins, 2019; AAUP, 2022; NCES, 2021). A report from the American Association of University Professors (AAUP) highlights that female faculty members earn approximately 81 percent of what their male colleagues make. Additionally, data from the College and University Professional Association for Human Resources (CUPA-HR) reveals similar trends among administrators, where women often receive lower salaries than men in equivalent positions. These findings underline the systemic nature of the gender pay gap in higher education, necessitating efforts to address these disparities.

Given the significance of this topic, this paper aims to deepen our understanding of gender disparities in university presidents' compensation by exploring the dynamics of pay-for-performance and its impact on gender differences in base salaries. In our study, university endowment level serves as the metric for pay-for-performance. Endowment signifies the president's ability to secure the institution's long-term financial stability. Moreover, the president's success in increasing endowment levels is often linked to solid fundraising skills, highlighting their capacity to attract significant donations and support for the university, which enhances financial resources and demonstrates leadership in generating external support vital for growth and sustainability. Additionally, allocating endowment funds towards critical university initiatives underscores the president's strategic planning and resource management capabilities. Universities can incentivise effective leadership by tying the president's compensation to endowment performance.

This study uses base salary as the main factor to determine pay rather than total compensation, which is the usual practice. This intentional decision aims to improve the clarity and consistency of our analysis, especially when examining gender disparities in the salaries of university presidents. The essential advantage of choosing base salary over total compensation is that base salaries are generally more transparent and structured, unlike bonuses and benefits, which can vary and be up for negotiation. This transparency promotes a sense of fairness and equality within an organisation. Furthermore, base salaries are less affected by external factors like negotiation skills or performance metrics, making them a more steady and reliable compensation. In their final year of employment, some presidents could receive higher total compensation through bonuses or benefits, known as "golden parachutes," which could skew the total compensation without accurately reflecting

performance. Additionally, many base salaries are subject to legal and regulatory constraints, making them a more relevant factor from a policy perspective.

This study combines OLS regression, quantile regression, and GLM to address outliers and skewness, confirming the robustness of our model and findings. Changes in endowment levels strongly increased female presidents' base pay but had little or no effect on male presidents'. This asymmetry makes female presidents' salaries more sensitive to endowment changes, especially at higher levels, potentially influencing financial risk-taking and reflecting differing standards for female leaders. The findings inform solutions for narrowing the gender pay gap.

2. Literature Review

The existing research presents mixed findings on whether such a correlation exists between endowments and university presidents' compensation. Bartlett and Sorokina (2005), Saunders (2007), Cheng (2014). Henry (2015) found a highly significant and positive relationship between compensation for executives at four-year public institutions and the levels of university endowments. Conversely, Ehrenberg et al. (2001) did not observe a significant link between endowment and compensation. Some studies report a negative correlation between endowment size (or alums contributions) and presidential compensation (Langbert & Fox, 2013). Part of the discrepancy may be due to how endowments get specified (e.g., endowment level vs. endowment per student).

Pay-for-performance links compensation to individual or organisational outcomes, aligning incentives to motivate goal achievement. For university presidents, this involves tying pay to metrics like financial performance, institutional advancement, or other goals. Research shows mixed results on pay-for-performance in higher education. Cheng (2014) found that such policies improved applications, enrollment, graduation rates, faculty salaries, fundraising, efficiency, and operating surplus. Ehrenberg, Cheslock, and Epifantseva (2001) observed that while fundraising success influenced presidential pay, overall performance had a limited impact.

Monks and McGoldrick (2002) noted similar incentive responses among presidents of liberal arts colleges and research institutions. Parsons and Reitenga (2014) found that private university compensation is linked to future reputation and resources but not educational quality. Risler and Harrison (2014) highlighted limited performance-based variables and persistent presidential pay increases, suggesting that public university presidents are paid like bureaucrats. Bai (2014) emphasised aligning compensation with institutional goals, such as research and enrollment growth.

2.1 Disparities, Employment and Inequities

Stereotypes against women persist in finance, limiting their access to top positions and credit (Van Staveren, 2014; Capelle-Blancard & Rebérioux, 2021). The few women who reach top financial positions tend to perform better than men, particularly under uncertainty (Staveren, 2014). Overall, gender inequalities in finance appear to stem from socialisation and self-fulfilling stereotypes rather than inherent differences (Capelle-Blancard & Rebérioux, 2021). Figure 1 shows how economic conditions influence the hiring of university presidents. Periods of stability and growth (2002-2008; 2013-2018; 2021-2023) saw more new female presidents, while economic uncertainty (2009; 2019-2020) coincided with a preference for male leaders, reflecting the stereotype that men are better suited for crises.

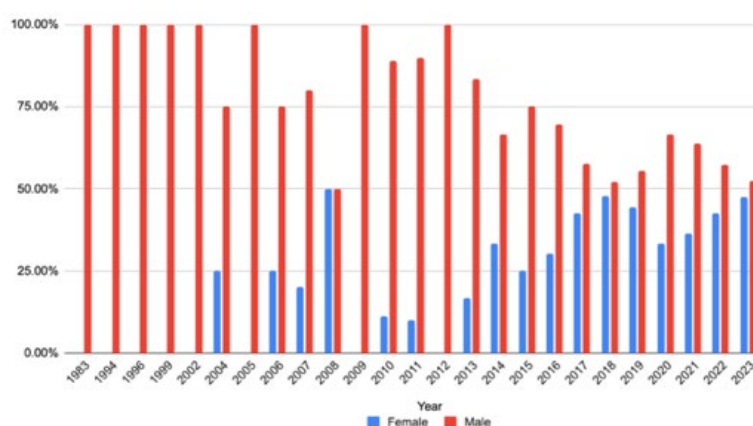


Figure 1: Percent of Female and Male New University Presidents

Source: compiled from authors' dataset

Figure 1 shows increasing percentages of new female presidents coinciding with periods of economic stability and growth (2002-2008; 2013-2018; 2021-2023). Conversely, during economic uncertainty (2009; 2019-2020), institutions seemingly adopted a more risk-averse approach, translating into a greater preference for new male leaders. Figure 1 also supports our finding of endowments' asymmetric effects on presidential pay. The decline in new female presidents in 2019, before the COVID-19 pandemic, aligns with the 2017 Tax Cuts and Jobs Act, which taxed university endowments starting in 2018.

3. Data Sources

Our study uses universities and colleges from AASHE's STARS program, ensuring a diverse sample to enhance the generalisability of findings on pay-for-performance and gender differences in university presidents' salaries. Private university salary data came from ProPublica.org, while public university data came from the *Chronicle of Higher Education* (2023). Community college salary data was sourced from college and state publications. Presidents' background details (e.g., *EXPERIENCE*, *TENURE*, *STEM*, *GENDER*, race, and ethnicity) were collected via LinkedIn and university announcements. *EXPERIENCE* measure the years of experience as University *PRESIDENT*, *vice president (VP)*, *PROVOST*, *DEAN* and/or department *CHAIR* prior to receiving their current presidential appointment. Enrollment and campus size data were from DATA USA and the National Center for Education Statistics (NCES). Endowment figures came from the National Association of College and University Business Officers (NACUBO). Research intensity (*R1*) was from the Carnegie Classification of Institutions of Higher Education (2024) and Power 5 (*P5*) classification from *Sports Illustrated* (2022).

Table 1: Summary Statistics

Variables	Mean	SD	Min.	Max.
<i>SALARY (dollars)</i>	555,981.3	370,888.7	3,000,000.00	65,945.04
<i>ENDOW (billions)</i>	1.428	4.504	0.00	43.00
<i>SIZE (acres)</i>	836.22	1898.96	3	25,000.00
<i>TENURE (years)</i>	5.97	5.17	0	49
<i>EXPERIENCE (years)</i>	14.93	8.64	0	49
<i>STUDENTS</i>	15,453.51	16,672.93	0	164,091
<i>GENDER</i>	0.36	0.48	0	1
<i>ASIAN</i>	0.05	0.23	0	1
<i>BLACK</i>	0.11	0.31	0	1
<i>LATINO</i>	0.08	0.27	0	1
<i>WHITE</i>	0.72	0.44	0	1
<i>OTHER</i>	0.01	0.11	0	1
<i>PUBLIC</i>	0.60	0.48	0	1
<i>Community College</i>	0.07	0.26	0	1
<i>R1</i>	0.25	0.43	0	1
<i>P5</i>	0.13	0.34	0	1
<i>IVY</i>	0.009	0.09	0	1
<i>HIRED_23</i>	0.16	0.36	0	1
<i>STEM</i>	0.38	0.48	0	1
<i>VP</i>	0.39	0.87	0	1
<i>PROVOST</i>	0.31	0.46	0	1
<i>DEAN</i>	0.48	0.71	0	1
<i>CHAIR</i>	0.16	0.36	0	1

4. Disparities, Exclusions, and Inequalities

Table 2 shows descriptive statistics for six institutional groups. Although not causal, the data suggests a positive correlation between endowment size and salary equality. As endowments grow, male and female salaries increase, and the female-to-male salary ratio rises, indicating greater responsiveness of female salaries to endowment changes.

Table 2: Average Base Salary, Endowment, and Base Salary Ratio

Institutional Grouping	Average Salary (SD)	Average Endowment (SD)	Female/Male Average Salary	Female/Male Salary Ratio
Com. College (CC)	264875.0 (92,859.4)	3.70 (7.36)	243,950.5/283,324.6	0.8610
Public 4-year (Pu4)	521817.6 (252,234.0)	1,112.59 (3,509.44)	501,507.0/530,482.9	0.9454
Private 4-year (Pr4)	589421.2 (448,655.6)	1,818.28 (5,812.86)	518,577.3/635,595.7	0.8324
Research 1 (R1)	824138.4 (510,379.8)	4,195.45 (7,543.68)	822,366.0/824,908.1	0.9969
Power 5 (P5)	857101.5 (398,069)	5069.78 (7,918.69)	853,348.2/858,690.1	0.9937
Ivy League (IVY)	1,651,498.0 (1,036,205.0)	21,160.00 (13,578.40)	1,835,847.0/1,467,140.0	1.2513

SD = Standard Deviation

The standard deviations suggest heteroskedasticity, as residual distribution varies with endowments and salaries. Higher mean endowment and salary compared to medians reveal positive skewness. Contrary to expectations, Power 5 and Research 1 universities show similar endowment levels and gender equity. Notably, female Ivy League presidents earned more than males, reflecting the possibility of a "pay premium" for high-potential women (Hill et al., R. I., 2016; Williams & Ceci, 2015). In this case, the institution's performance, as measured by its commitment to diversity and excellence, may be rewarded with higher compensation for female leaders who can contribute to these objectives (Gayle et al., 2012).

Table 3 shows a link between institutional inclusivity and gender equity, where the number of excluded institutional groups measures inclusivity. Research 1 institutions are the most inclusive, excluding only community colleges. Table 2 indicates they are also the most gender-equitable, with a female-to-male salary ratio of 0.9969. Power 5 institutions have a similar ratio of 0.9937. This is not coincidental, as 51 of our sample's 60 P5 schools are among the 109 Research 1 universities.

Contrary to the common belief that athletic-focused institutions like those in the P5 and R1 universities are less favorable towards women, the descriptive statistics in Table 2 reveal that these institutions have similar endowment levels and gender equity. This association is not coincidental; 51 of the 60 P5 schools are also among the 109 R1 universities in our sample.

Table 3: Median Base Salary, Median Endowments, Disparities, Exclusions and Inequities.

Institutional Grouping	Median Salary	Median Endowment	Disparities, Exclusions, and Inequalities
Community College (CC)	247,000.00	0.00	<i>Pu4, Pr4, R1, P5, IVY</i>
Public 4-year (Pu4)	457,944.50	225.75	<i>CC, Pr4, IVY</i>
Private 4-year (Pr4)	450,000.00	422.00	<i>CC, Pu4</i>
Research 1 (R1)	690,000.00	1,600.00	<i>CC</i>

Institutional Grouping	Median Salary	Median Endowment	Disparities, Exclusions, and Inequalities
Power 5 (P5)	778,389.00	1,915.00	CC, IVY
Ivy League (IVY)	1,467,150.00	21,160.00	CC, Pu4, P5

The following econometric analysis establishes a statistically significant link between endowment size, inclusivity, and gender equity, corroborating the observed patterns inferred from the descriptive statistics of Tables 2 and 3.

5. Methodology

We applied OLS, quantile regression, and GLM to address data issues. OLS is simple and interpretable but sensitive to heteroscedasticity (Wooldridge, 2010). GLMs handle skewness and heteroscedasticity with flexible distributions and link functions (Dobson & Barnett, 2018). Quantile regression resists outliers and captures the central tendency in skewed data (Koenker & Hallock, 2001). These methods link base salary, gender, endowments, and pay-for-performance.

We start with a model explaining base salary variation, incorporating university endowments in equation (1).

$$Salary_i = \beta_0 + \beta_1 ENDOW_i + \varepsilon_i \quad (1)$$

Table 4 shows six significant β_1 estimates, confirming persistent gender differences across GLM, OLS, and quantile regressions. The GLM (log-level) model predicts a \$1 billion endowment increase raises female presidents' salaries by 13.1% but males' by 2.1%. The quantile regression (log-level) model estimates a 14.5% increase for females and 3.5% for males. The OLS (log-level) model predicts a 12.4% increase for females and 1.9% for males. These gender gaps are not due to endowment size, as male and female averages (\$1.6B vs. \$1.2B) and medians (\$0.244B vs. \$0.233B) are similar.

With zero endowments, Table 4's quantile regression predicts median salaries of \$357,479.8 for women and \$447,383.3 for men, yielding a 0.80 female-to-male ratio. This aligns with the 20.7% gap found by Barbezat & Hughes (2005), AAUW's 21% gap (2014), and U.S. Bureau of Labor Statistics data (2019), showing that women earned 82 cents per male dollar.

Table 4: OLS, Quantile, and GLM Estimations of Equation (1)

	Dependent Variable	Female β_0	Female β_1	R-sq. / L.R. (Female)	Male β_0	Male β_1	R-sq. / LR (Male)
OLS	Salary	381124.5*	108995.0*	R-sq. = 0.503	546621.8*	18823.21*	R-sq. = 0.069
OLS	ln(Salary)	12.859*	0.124*	R-sq. = 0.276	13.084*	0.019*	R-sq. = 0.039
Q (0.50)	Salary	357479.8*	107037.8*	R-sq. = 0.228	447838.3*	29694.32*	R-sq. = 0.075
Q (0.50)	ln(Salary)	12.866*	0.145*	R-sq. = 0.156	13.017*	0.035*	R-sq. = 0.062
GLM ^a	Salary	380886.3	135102.0	LR = 92.574*	484537.1	83710.67*	LR = 37.048*
GLM ^a	ln(Salary)	12.852*	0.131*	LR = 56.519*	13.081*	0.021*	LR = 10.799*

^a family: gamma; link: identity Q (0.50): quantile (median)

*p-value <0.001

6. Gender, Endowment and Pay-for-Performance

Equation (2) adds an interaction term $ENDOW * GENDER$ to equation (1) to capture the differential impact of endowment size on the salaries of male and female university presidents.

$$Salary_i = \beta_0 + \beta_1 ENDOW_i + \beta_2 GENDER + \beta_3 ENDOW_i * GENDER + \varepsilon_i \quad (2)$$

Equation (2) allows us to use the following hypothesis tests to determine if the different endowment effects on base salary are statistically significant.

Hypothesis Test 1:

Ho: If changes in the endowment do not impact male base salary, then $\beta_1 = 0$, implying that base salary is not associated with changes in pay-for-performance

Ha: If changes in the endowment impact male base salary, then $\beta_1 \neq 0$, implying that base salary is associated with changes in pay-for-performance.

Hypothesis Test II:

Ho: If there is no significant difference between males and females in the effect of endowments on salary, then $\beta_3 = 0$, implying that gender does not influence pay-for-performance outcomes.

Ha: If there is a significant difference between males and females in the effect of endowments on salary, then $\beta_3 \neq 0$, implying that gender does influence pay-for-performance outcomes.

7. Achieving Gender Equity

This subsection develops an equation linking gender equity in presidential salary to endowments. The differing intercepts and the positive female endowment coefficients and negative male endowment coefficients in Table 4 suggest an endowment level at which female and male base salaries are equal.

When $GENDER = 0$, equation (2) yields the male presidents' endowment equation:

$$Salary_i = \beta_0 + \beta_1 ENDOW_i + \varepsilon_i \quad (3)$$

Conversely, when $GENDER = 1$, equation (2) becomes the female presidents' endowment equation:

$$Salary_i = (\beta_0 + \beta_2) + (\beta_1 + \beta_3) ENDOW_i + \varepsilon_i \quad (4)$$

Setting equation (3) equal to equation (4) and solving for $ENDOW$ yields the endowment level that achieves gender equality in salary;

$$ENDOW = -\frac{\beta_2}{\beta_3} \quad (5)$$

Since endowments cannot be negative quantities, β_2 or β_3 are restricted to be negative in equation (4), which represents the balance of two opposing forces; β_2 reflects the extent to which female salaries differ from males, while β_3 represents the marginal effect of university endowments on female presidents' base salaries differs from male presidents.

Table 5 shows that each estimation method yields $\beta_2 < 0$ and $\beta_3 > 0$, suggesting that women's salaries are significantly lower than men's and that the marginal impact of endowments on female presidents' salaries is greater than the marginal impact endowments have on male presidents' base salaries.

Table 5: OLS, Quantile, and GLM Estimations of Equation (2)

	Dependent Variable	β_0	β_1	β_2	β_3	$-(\beta_2/\beta_3)$	
OLS	Salary	550963.7*	18678.21*	-152839*	90307.7*	1.692	R ² =0.215
OLS	log(Salary)	13.08*	0.019*	-0.224*	0.105*	2.133	R ² =0.130
Q(0.50)	Salary	447838.3*	29694.32*	-90358.44**	77434.24**	1.165	R ² =0.124
Q(0.50)	log(Salary)	13.01*	0.035*	-0.151**	0.109**	1.358	R ² =0.097
GLM ^b	Salary	484587.1*	83710.67*	-103650.7*	51391.29	2.016	LR=113.54*
GLM ^b	log(Salary)	13.08*	0.021*	-0.228*	0.110*	2.069	LR=64.960*

^b family: gamma; link: identity

*p-value <0.001

Table 5 shows that the OLS, quantile, and GLM estimates of β_3 with $\ln(\text{Salary})$ as the dependent variable are highly significant and remarkably consistent. Table 5 also reveals that the average gender-equal endowment ranges from \$1.692 billion to \$2.133 billion; the median equity endowment ranges from 1.165 billion to \$1.358 billion. The $-(\beta_2/\beta_3)$ GLM estimates are the most consistent, suggesting that the relationship between university endowments and gender equality in salaries is robust, indicating that the findings are not heavily influenced by the specific estimation method.

8. Control Variables Analysing Gender Disparities in University Presidential Salaries

Equation (3) extends equation (2) by introducing 30 control variables: nine human capital characteristics (HC_i), nine university characteristics (U_i), six individual characteristics (I_i), and six interaction terms, INT_i .

$$Salary_i = \beta_0 + \beta_1 ENDOW_i + \beta_2 GENDER + \beta_3 ENDOW_i * GENDER + \delta HC_i + \rho U_i + \gamma IND_i + \eta INT_i + \varepsilon_i \quad (6)$$

8.1 Human Capital

This study includes dummy variables for prior roles (president, VP, provost, dean, chair) and calculates cumulative years in leadership ($EXPERIENCE$). As seen in executive compensation research, a quadratic salary model captures the diminishing or reversing returns to experience. In a log-level format, $TENURE$ reflects how accumulated human capital during a president's tenure increases effectiveness and salary. The dummy variable $STEM$ indicates whether the president holds a STEM degree, acknowledging the trend of hiring STEM-educated presidents to enhance institutional technical expertise.

8.2 University Characteristics

Gender wage disparities are analysed using $GENDER$ interactions with institutional group dummies across $PUBLIC$ and $PRIVATE$ four-year schools, community colleges (CC), Ivy League (IVY), $P5$, $R1$ universities. Larger institutions typically pay higher salaries (Cheng, 2014; Ehrenberg et al., 2001), with campus size ($SIZE$) included as a control variable. Larger campuses often require more extensive physical infrastructure to support various facilities and academic departments, which can influence compensation packages for university presidents (Essaji & Horton, 2010). $SIZE$ and $SIZE^2$ capture the non-linear relationship between size and salary: administrative costs initially rise with complexity, but economies of scale reduce average costs as campuses grow. This approach aligns with pay-for-performance by balancing administrative costs and operational efficiency.

Langbert & Fox (2011) reported that institutional size, which includes enrollment, is linked to presidents' salaries in private institutions. Pay-for-performance in university presidents' salaries can be modeled as a research-teaching trade-off, as represented in equation (4):

$$Salary_i = \beta X + \eta_1 R1 + \eta_2 Students + \eta_3 R1 * Students + \eta_4 R1 * GENDER + \varepsilon_i \quad (4)$$

Equation (4) rewrites equation (3) for analytical convenience, where the term βX includes all independent variables except for research intensity ($R1$), student enrollment ($Students$), and interaction terms: $R1 * Students$ and $R1 * GENDER$. Equations (5) and (6) indicate how the president's salary varies with enrollment and depends upon the university's research intensity (the coefficient of $GENDER * Students$ was not significant and, therefore, dropped from the model).

$$\text{When } R1 = 0: \partial Salary_i / \partial Students = \eta_2 \quad (5)$$

$$\text{When } R1 = 1: \partial Salary_i / \partial Students = \eta_2 + \eta_4 \quad (6)$$

Including $R1$, $Students$, and $R1 * Students$ as control variables in equation (4) allows the university to interpret the president's base salary as an administrative cost of production and the university president to interpret the base salary as income she is incentivised to maximise. University presidents can increase base salary compensation by reducing expenses and operating efficiently. Specifically, the enrollment level that maximises the president's base salary for Research 1 universities is determined by setting equation (6) to zero:

$$\eta_2 + \eta_4 = 0 \quad (7)$$

This condition highlights the balance universities must strike between enrollment size and research intensity as part of their broader strategy for minimising costs and salary structure that incentivises operational efficiency.

8.3 Individual Characteristics

We included racial/ethnic dummy variables (*ASIAN*, *BLACK*, *LATINO*, *WHITE*, and *OTHER*) to account for salary biases. For 84 new 2023 presidents, we checked public sources for salary data and introduced the dummy variable *HIRED_23* to compare salaries with incumbents.

9. Results

Table 6 shows regression estimates of equation (6). Model 4 has the highest L.R. statistic, making it the focus. The *ENDOW* coefficient, estimating endowment effects on male presidents' salaries, is insignificant. However, *GENDER*ENDOW* coefficients are robust and significant, reflecting differential effects for female presidents.

Table 6: OLS, Quantile, and GLM Estimations of Equation (6)

Estimation	OLS	Quantile	GLM	GLM	GLM	GLM
Model	(1)	(2)	(3)	(4)	(5)	(6)
family	---	---	gamma	gamma	gamma	exponential
link	---	---	identity	log	inverse	log
Dependent Variable	ln(salary)	ln(salary)	ln(salary)	salary	ln(salary)	ln(salary)
CONSTANT	12.283*	12.682*	12.256*	12.415*	0.081*	2.498*
ENDOW	-0.019*	0.003	-0.021*	-0.008	0.0001*	-0.002*
GENDER	-0.276*	-0.249**	-0.277*	-0.258*	0.001*	-0.022*
GENDER*ENDOW	0.133*	0.129*	0.136*	0.115*	-0.0007*	0.012*
ASIAN	-0.035	0.090	-0.038	-0.083	0.0002	-0.004
BLACK	-0.109	0.001	-0.114	-0.126	0.0006	-0.011
LATINO	-0.042	-0.032	-0.050	-0.082	0.0002	-0.006
WHITE	-0.049	0.019	-0.052	-0.059	0.0003	-0.005
PUBLIC	-0.455*	-0.387*	-0.452*	-0.493*	0.002*	-0.035*
PUBLIC*GENDER	0.311*	0.193	0.314*	0.304*	-0.001*	0.026*
CC	-0.818*	-0.858*	-0.817*	-0.887*	0.004*	-0.063*
CC*GENDER	0.304***	0.291***	0.307**	0.288***	-0.001***	0.024**
STUDENTS	1.2E-05*	1.3E-05*	1.2E-05*	1.3E-05*	-6.6E-08*	1.4E-06*
R1	0.540*	0.401*	0.542*	0.538*	-0.003*	0.043*
R1*GENDER	-0.124	-0.064	-0.124	-0.109	0.0006	-0.010
R1*STUDENTS	-1.4E-05*	-1.0E-05**	-1.4E-05*	-1.3E-05*	7.6E-08*	-1.4E-06*
P5	0.419*	0.327*	0.427*	0.383*	-0.002*	0.037*
P5*GENDER	-0.278***	-0.228***	-0.292***	-0.256	0.001***	-0.030**
IVY	1.136*	0.220	1.193*	0.657	-0.006*	0.127*
IVY*GENDER	-1.992*	-1.440**	-2.089*	-1.492**	0.011*	-0.216*
LOG(SIZE)	0.200**	0.090	0.208**	0.196**	-0.001**	0.018*
LOG(SIZE) ²	-0.015**	-0.008	-0.015**	-0.016**	9.2E-05**	-0.001*
HIRED_23	0.076	-0.025	0.079	0.072	-0.0004	0.007
STEM	0.099**	0.077	0.096**	0.115*	-0.0005	0.006**
PRESIDENT	-0.021	0.017	-0.024	-0.002	0.0001	-0.004
VP	-0.024	-0.004	-0.023	-0.024	0.0001	-0.001
PROVOST	-0.057	-0.062	-0.058	-0.054	0.0003	-0.004
DEAN	0.019	-0.008	0.021	0.017	-0.0001	0.003
CHAIR	0.016	0.006	0.011	0.011	-0.0001	-0.001
TENURE	0.014**	0.004	0.0148*	0.015*	-8.0E-05**	0.001*

Estimation	OLS	Quantile	GLM	GLM	GLM	GLM
EXPERIENCE	0.022*	0.013**	0.022*	0.022*	-0.0001*	0.001*
EXPERIENCE ²	-0.0005*	-0.0002***	-0.0005*	-0.0005*	3.4E-06*	-4.6E-05*
Adj-R ²	0.474	0.351	---	---	---	---
Obs.	422	422	422	422	422	422
LR-Statistic	---	---	412.382*	462.018*	406.822*	405.799*

p*-value <0.001 *p*-value <0.05 ****p*-value <0.10

A \$1 billion endowment increase raises female salaries by 10.7%, with no significant effect on males. Female presidents earn 28.8% more at community colleges and 30.4% more at public universities but 25.8% less at private institutions and 149.2% less at Ivy League schools. *R1*GENDER* and *P5*GENDER* coefficients are negative but insignificant, consistent with nearly equal male-female base salary ratios in Table 2. The *SIZE* and *SIZE*² coefficients show salaries peaking at 457 acres, while *EXPERIENCE* and *EXPERIENCE*² coefficients show salaries peaking at 18.68 years. *TENURE* increases base salary by 1.5% annually. Race and ethnicity (*ASIAN*, *BLACK*, *LATINO*, *WHITE*) are not significant predictors of salary, aligning with prior findings (Barbezata & Hughes, 1999; Hebner, 2018).

9.1 Gender-Equity Endowment Estimations

Table 7 confirms the robustness of equation (5) estimates. Model 4 predicts a gender-equity endowment of \$2.243 billion (CI: 0.989–3.489), consistent with $-(\beta_2/\beta_3)$ estimates in Tables 6 and 7.

Table 7: Estimate of Gender-Equity Endowment Level and Confidence Interval

Model	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	Q (0.50)	GLM	GLM	GLM	GLM
Family	---	---	gamma	gamma	gamma	exponential
Link	---	---	identity	log	inverse	log
Dependent						
Variable	ln(salary)	ln(salary)	ln(salary)	salary	ln(salary)	ln(salary)
β_0	12.283*	12.682*	12.256*	12.415*	0.081282*	2.498*
β_1	-0.019*	0.003	-0.021*	-0.008	0.000115*	-0.002*
β_2	-0.276*	-0.249**	-0.277*	-0.258*	0.001528*	-0.022*
<i>c</i>	0.133*	0.129*	0.136*	0.115*	-0.000728*	0.012*
$-(\beta_2/\beta_3)$	2.027**	1.930**	2.036**	2.243**	2.173**	1.815**
CI	(1.013, 3.13)	(0.499, 2.413)	(0.997, 3.062)	(0.989, 3.489)	(1.507, 2.847)	(0.926, 2.680)

**p*-value <0.001

***p*-value <0.05

Q (0.50) = median quantile regression

Table 7 results corroborate the gender equity inferences of Tables 2 and 3, showing that Research 1 and Power 5 institutional groupings are the most gender equitable. The quantile coefficients $-(\beta_2/\beta_3)$ in Table 7 predict a gender-equity median endowment of 1.930, close to the Power 5 median of \$1.915 billion. The quantile confidence interval (0.499–2.413) aligns with the DEI data in Tables 2 and 3, including (the median endowments of) Research 1 institutions (\$1.600 billion) and Power 5 schools but excluding community colleges (\$0.00 billion), public 4-year (\$0.225 billion), private 4-year (\$0.422 billion), Ivy League (\$21.00 billion), female (\$0.244 billion), and male (\$0.233 billion) median endowments.

10. Discussion

Endowments impact male and female university presidents' base salaries differently. Female presidents' salaries rise with endowments, while male salaries show minimal change. This analysis focuses on base salaries, not total compensation, which likely depends on endowment performance. Control variables confirm that these differences are not due to institutional type, school activities, complexity, race, ethnicity, or human capital factors (e.g., tenure, experience, STEM education). Female presidents may be incentivised to improve financial

performance and fundraising due to the direct link between endowment growth and compensation. Male presidents, less influenced by endowment performance, may focus on academics, efficiency, or strategy. Median gender-equity endowment levels and confidence intervals highlight diversity and inclusion patterns, especially in Research 1 and Power 5 institutions, which are the most equitable and inclusive. These findings, significant given women's historical underrepresentation in research and sports, suggest that Research 1 and Power 5 universities share progressive practices promoting diversity, equity, and opportunity campus-wide (Scott, 2019).

10.1 Pay-for-Performance

Equation (7) requires η_2 and η_4 for cost minimisation (salary maximisation). Model 4 meets this with $\eta_2 = 1.3\text{E-}05$ and $\eta_4 = -1.3\text{E-}05$, confirming a gender-neutral pay-for-performance structure. This alignment balances research and teaching, supporting cost minimisation and institutional goals. Findings align with studies linking research, teaching, administrative efficiency, and enrollment targets to pay-for-performance (Jauch, 1976; Bai, 2014). Diminishing returns to experience indicate that salary growth depends on performance, not tenure alone. *EXPERIENCE* and *EXPERIENCE*² highlight the value of leadership, while insignificant prior experience dummies suggest limited transferability of expertise across institutions. Longer tenures improve effectiveness, reflected in higher pay under pay-for-performance. STEM-degree presidents earn 11.5% more, signaling a premium for innovation and leadership in technology-driven initiatives.

10.2 Policy Implications

Figure 2, Figure 3, and Figure 4 depict equations (2), (3), and (4) interpreting the quantile regression parameter estimates shown in Table 7. These simplified diagrams illustrate the main findings of our report and act as visual aids for evaluating gender-equity proposals. Equation (3) represents the equation for male presidents and is depicted by line *M*. It has an intercept of β_0 and is shown as a horizontal line (perfectly elastic), indicating the insignificant coefficient of *ENDOW*, β_1 . Equation (4) corresponds to the equation for female presidents and is illustrated by lines *F*₁, *F*₂, *F*₃, and *F*₄. The slope of these lines is determined by $\beta_1 + \beta_3$. Equation (5) represents the gender-equity endowment level, $E^* = -(\beta_2/\beta_3)$, and is graphically shown at the intersections of equations (3) and (4). Table 7's quantile regression estimates $E_1^* \approx 2.0$, positioning the R1 and P5 schools at point B on line *F*₁. The approximate median endowment for both female and male presidents is $E_2^* \approx 0.23$, leading to a pay gap represented by (C - A) on line *F*₁. This section analyses gender-equity policies and their effects on closing the (C - A) pay gap.

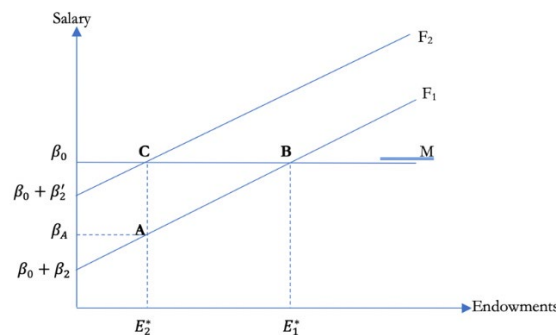


Figure 2: Impact of Effective Policy Measures on Gender Disparities in Base Salaries

Policies like equal pay laws, gender equity initiatives, salary transparency, and anti-discrimination efforts reduce gender salary gaps and lower the *GENDER* coefficient β_2 . Figure 2 shows this as a shift from *F*₁ to *F*₂, moving from A to C and reducing the equity endowment level from E_1^* to E_2^* .

Effective policies—equal pay laws, gender equity initiatives, salary transparency, and anti-discrimination efforts—can reduce gender salary gaps, lowering the *GENDER* coefficient, β_2 . Figure 2 shows this shift from *F*₁ to *F*₂ (point A to C), decreasing the equity endowment level (E_1^* to E_2^*). Beyond point C, female presidents out-earn males, not due to a pay premium but asymmetric pay-for-performance tied to endowments. This aligns with findings that female community college and public university presidents earn 28.8% and 30% more than men, while female private university presidents earn 25.8% less (point A).

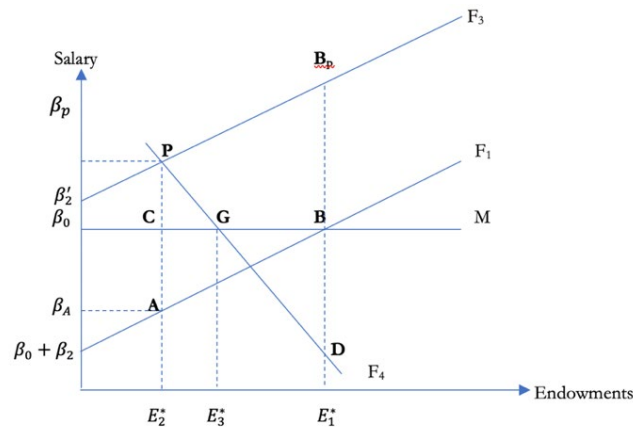


Figure 3: illustrates the scenario where all-female university presidents receive a paid premium, shifting the curve from F_1 to F_3 . F_3 is higher than M across all endowment levels.

A pay premium makes β_2' s positive, meaning female presidents earn more. To keep the gender equity endowment level $E_3^* = -(\beta_2' / \beta_3)$, positive, β_3 must be negative, making the female curve's slope $\beta_1 + \beta_2'$ negative. This rotates F_3 to F_4 , shifting the ($B_p - B$) pay premium into a ($B - D$) pay gap. Figure 3 helps explain how Ivy League female presidents' 25% pay premium (Table 2) led to a 144% salary gap (Table 7, Model 2).

11. Conclusion

This study examines gender-based salary disparities among university presidents and the impact of endowments. Findings show that female salaries rise with endowments, while male salaries do not, revealing asymmetries in pay-for-performance. Beyond endowments, salaries follow economies of scale—rising, then falling with campus size—highlighting resource efficiency. Diminishing returns to experience suggests a shift toward performance-driven pay. Future research should expand the dataset and apply machine learning to enhance generalisability. This will deepen insights into gender pay gaps and inform strategies for equity in academic leadership.

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