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Football Spending for Success: Analyzing Investment and Team Performance in NCAA FBS Programs

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Abstract

This study examines the relationship between financial investment and team performance in NCAA Division I Football Bowl Subdivision football programs from 2010 to 2023. Key variables include total football spending, head coach salaries and bonuses, and win-loss records. Ordinary Least Squares (OLS) regression models were used to examine these associations, controlling for conference affiliation by distinguishing between the so-called power and non-power conferences. The results indicate that greater investment in football operations and coaching compensation is significantly associated with higher win percentages, particularly within power conference programs. However, the impact of financial investment on final rankings differs by conference type. Total football spending is a significant predictor of rankings in power conferences, whereas head coach salary is the only significant predictor in non-power conferences. These findings suggest that financial investment enhances team performance, although its effectiveness varies depending on institutional context.

Keywords: NCAA FBS programs, football spending, head coach compensation, team performance

In the landscape of collegiate athletics, few programs receive as much financial investment, media attention, and institutional prestige as NCAA Division I Football Bowl Subdivision (FBS) football programs. Universities increasingly commit substantial resources to their football programs in pursuit of competitive success, national visibility, and financial returns through ticket sales, broadcast rights, and alumni engagement. Among these investments, two of the most visible and scrutinized areas are overall football program spending and head coach compensation (Byrd et al., 2013; Roufagalas & Byrd, 2015). Yet, a critical question remains: To what extent do these financial inputs translate into improved on-field performance?

Theoretical insight into this question can be drawn from agency theory, which examines how organizations design compensation systems to align the interests of principals (e.g., university administrators) and agents (e.g., head coaches). Jensen and Meckling (1976) suggested that when compensation is tied to outcomes, agents are more likely to pursue behaviors that align with organizational goals. In the context of collegiate football, head coaches serve as institutional agents responsible for delivering wins, national rankings, and brand visibility (Jensen & Murphy, 1990; Orszag & Israel, 2009; Zimbalist, 1999).

Within this framework, pay-performance sensitivity refers to the degree to which compensation reflects variations in team success. Prior research has shown that higher coaching salaries and performance-based bonuses are often positively associated with improved team performance, including win percentages and postseason appearances (Colbert & Eckard, 2015; Leeds et al., 2018; Park et al., 2021). However, this relationship is not always linear or consistent. For example, Mirabile and Witte (2012) found that coach compensation had no significant impact on winning. Additionally, factors such as injuries, staff turnover, and the level of competition may moderate the relationship between compensation and team performance (Balduck et al., 2010; Warnock, 2018). Additionally, power conference programs—commonly referring to schools in the ACC, Big Ten, Big 12, Pac-12, and SEC between 2010 and 2023—typically benefit from greater financial resources, enhanced infrastructure, and more robust recruiting systems, all of which can intensify the performance impact of financial investment. In contrast, non-power conference programs may rely more heavily on cost-effective strategies and performance-linked compensation to remain competitive.

Although the literature has largely focused on coaching compensation, relatively few studies have explored the broader impact of total football program spending on team success. According to the Knight Commission on Intercollegiate Athletics (n.d.), overall football spending includes coach compensation, recruiting expenses, team travel, equipment and supplies, facilities and maintenance, game-day operations, medical and training services, and other administrative costs. This comprehensive measure reflects the operational scope of collegiate football programs and has become an essential strategic lever for achieving sustained competitive success. Financially robust programs are often better positioned to attract elite coaching talent and high-performing athletes, creating a reinforcing cycle in which investment leads to success, which in turn justifies further investment (Dronyk-Trosper & Stitzel, 2015; Grant et al., 2013). Consequently, institutional spending and coaching compensation should not

only be viewed as reflections of past success but also as proactive strategies to secure future performance gains.

Building on this perspective, the purpose of this study is to examine the relationship between financial investment and team performance in NCAA FBS programs, specifically focusing on both head coach compensation and overall football program spending. Although prior research has largely focused either on coaching compensation or broader athletic department expenditures across multiple sports (Jones, 2012; Litan et al., 2003; Orszag & Orszag, 2005), few studies have isolated football-specific spending and directly linked it to football team performance outcomes, such as win percentage and AP Poll Top 25 rankings. Unlike earlier studies, this study provides a more focused, football-specific, and updated empirical analysis based on longitudinal data from 2010 to 2023.

This research topic is increasingly relevant as collegiate athletic departments face mounting pressure to justify escalating costs. Despite significant financial commitments to football operations, there remains limited empirical evidence evaluating the actual performance returns on these investments. By examining both head coach compensation and total football program spending, this study provides timely data-driven insights for university leaders and athletic administrators involved in budgeting, strategic planning, and program evaluation. Grounded in theoretical and empirical literature, the following hypotheses are proposed:

Hypothesis 1: Higher compensation of head coaches in NCAA FBS football programs is positively associated with team performance.

Hypothesis 2: Higher overall spending in NCAA FBS football programs is positively associated with team performance.

Research Methods

Sample and Data Collection

The study sample comprises NCAA FBS teams over the 13-year period from 2010 to 2023, except for 2020. Data from the 2020 season were excluded due to incomplete and inconsistent schedules caused by COVID-19-related disruptions, which led to game cancellations and modifications across NCAA football. Data were collected at the team-season level to capture annual variations in performance, compensation, and recruiting outcomes.

Three primary sources provided the data for this analysis. Team records, including win-loss statistics and related performance metrics, were obtained from the ESPN (n.d.) website. Head coach salary data, encompassing both base salary and bonus components, were sourced from USA Today (n.d.). Football spending data were extracted from Knight-Newhouse College Athletics Database, which is an initiative funded by Knight Foundation in partnership with Syracuse University Newhouse School of Public Communications. The data in this online

database are self-reported by institutions on NCAA financial reports and on reports required by the federal government (Knight Commission on Intercollegiate Athletics, n.d.). Observations with missing or inconsistent data were excluded, thereby enhancing the reliability of the subsequent regression analyses. The dataset comprises a total of 858 team-year observations used in the regression analyses.

Data Analyses

To empirically investigate whether the spending of football teams affects performance in NCAA FBS programs, we estimate the following OLS (Ordinary Least Squares) regression model:

$$WP(or\ Rankings) = \beta_0 + \beta_1 Salaries + \beta_2 Bonus + \beta_3 FBSP + \beta_4 Public_Sch + \beta_5 Power_Conf \quad (1)$$

We utilize two dependent variables, *WP* and *Rankings*, as empirical proxies to measure NCAA football team performance. *WP* is a continuous variable representing the percentage of wins to the total number of NCAA FBS football games in the annual season, ranging from 0 to 1. The variable, *Rankings*, denotes the final AP top 25 rankings in the NCAA FBS programs, ranging from 1 to 25. The highest number of *WP* indicates the highest performance, whereas the lowest number of *Rankings* indicates the highest performance.

We have three variables of interest. There are two variables to measure the compensation of head coaches in NCAA FBS football programs. The variable *Salaries* is the total annual salary of the football head coaches, and *Bonus* is the total annual bonus of the football head coaches. We expect β_1 and β_2 to be significant and positive (negative) when the dependent variable is *WP* (*Rankings*) to support the first hypothesis. In addition, we use the total annual spending of football teams, *FBSP*, to measure overall spending on NCAA FBS football programs. We expect β_3 to be significant and positive (negative) when the dependent variable is *WP* (*Rankings*) to support the second hypothesis. These three variables are adjusted for inflation based on the 2010 Consumer Price Index to reflect the real value of college financial support in the analysis. Last, we have two control variables: *Public_Sch* is the indicator variable that is one for public universities and zero for non-public universities, and *Power_Conf* is the indicator variable that is one for power conferences and zero for non-power conferences. All variables are defined in the Appendix.

Results

Table 1 reports descriptive statistics for the full sample. On average, the football teams win 51% of games during the annual season. The mean (median) of the annual salary and bonus are 1.86 (1.47) and 0.08 (0.00) million, respectively. The mean (median) of the annual spending on football is 16.54 (13.55) million. Based on the comparison of mean and median values, the variables appear to be slightly right skewed. A total of 85% of the full sample include public universities, and 51% are in power conferences.

Table 1*Descriptive Statistics*

Variable	N	Mean	Std Dev	Minimum	Median	Maximum
<i>WP</i>	1638	0.5199	0.2184	0.0000	0.5385	1.0000
<i>Rankings</i>	349	13.3754	7.3566	1.0000	14.0000	25.0000
<i>Salaries</i>	1567	1.8646	1.5930	0.0000	1.4655	9.9393
<i>Bonus</i>	1027	0.0802	0.1799	0.0000	0.0000	1.6604
<i>FBSP</i>	1493	16.5382	10.8393	0.0000	13.5507	59.5242
<i>Public_Sch</i>	1775	0.8479	0.3592	0.0000	1.0000	1.0000
<i>Power_Conf</i>	1775	0.5121	0.5000	0.0000	1.0000	1.0000

Note. This table presents the descriptive statistics of the full sample. The number of *Salaries*, *Bonus*, and *FBSP* are in millions. The mean value of *Public_Sch* (*Power_Conf*) indicates that the number of public vs. private college (power vs. non-power conference) yearly observations is 1505 vs. 270 (909 vs. 866). All variables are defined in Appendix.

Table 2 presents a Pearson correlation matrix for the full sample. *WP* is significantly and negatively associated with *Rankings* (correlation coefficient: -0.6544) because the football team that won the most is Ranking one. More interestingly, *WP* (*Rankings*) is significantly and positively (negatively) related to *Salaries*, *Bonus*, and *FBSP* (correlation coefficients: 0.3402, 0.2818 and 0.3366, respectively), which indicates that football teams with higher compensation and more spending are more likely to show better performance.

Table 2*Pearson Correlation Table*

	<i>WP</i>	<i>Rankings</i>	<i>Salaries</i>	<i>Bonus</i>	<i>FBSP</i>	<i>Public_Sch</i>
<i>Rankings</i>	-0.6544**					
<i>Salaries</i>	0.3402**	-0.3710**				
<i>Bonus</i>	0.2818**	-0.2367**	0.4615**			
<i>FBSP</i>	0.3366**	-0.4705**	0.8584**	0.4250**		
<i>Public_Sch</i>	-0.0161	0.0176	0.0837**	0.1099**	0.0708**	
<i>Power_Conf</i>	0.2189**	-0.3018**	0.6763**	0.2393**	0.7205**	-0.0902**

** Statistically significant at .01 level.

Table 3 presents the results of our analysis of model (1), using *WP* as a dependent variable. The overall regression model was statistically significant ($F [5, 852] = 36.53, p < .001$). The variance inflation factors (VIFs), which measure correlations among the independent variables, are all below 5, indicating no serious multicollinearity and enhancing the reliability of the regression model. The first column shows the results using the full sample. We found significant and positive coefficients on *Salaries* and *Bonus* (< 0.01 , and < 0.01 , respectively). The results support Hypothesis 1, which predicted that higher compensation of head coaches in NCAA FBS programs is positively associated with team performance. Additionally, we find a significant and positive coefficient on *FBSP* at the 5% significance level,

supporting Hypothesis 2, which predicted higher overall spending in NCAA FBS programs is positively associated with team performance. These results indicate that football teams with higher compensation of head coaches and higher spending are more likely to win NCAA football games.

Next, we split the full sample into two subsamples—power conferences and non-power conferences—and report the results in the second and third columns of Table 3. Similar to the results using the full sample, the results with only power conferences show that three variables of interest are significantly and positively associated with *WP*. However, when we ran the regression model only with non-power conferences, *FBSP* became insignificant, which indicates that the compensation of NCAA FBS head coaches has a significant impact on performance but the overall spending does not.

Table 3

Regression Analysis 1

Dependent Variable = *WP*

	Full Sample		Only Power Conferences		Only Non-Power Conferences	
	Coef.	P value	Coef.	P value	Coef.	P value
<i>Intercept</i>	0.4699**	<.001	0.5631**	<.001	0.4231**	<.001
<i>Salaries</i>	0.0395**	<.001	0.0376**	<.001	0.0696**	0.008
<i>Bonus</i>	0.1603**	<.001	0.1162*	<.012	0.3808**	<.001
<i>FBSP</i>	0.0028*	0.028	0.0031*	0.018	0.0017	0.672
<i>Public_Sch</i>	-0.0534	0.196	-0.2109	0.125	-0.0267	0.572
<i>Power_Conf</i>	-0.0678**	0.002				
N	858		425		433	
F-Statistic	36.53**		27.57**		10.49**	
Adj. R^2	17.17%		20.04%		8.08%	

* Statistically significant at .05 level.

** Statistically significant at .01 level.

Table 4 presents the results of our analysis of model (1), using *Rankings* as a dependent variable. The overall regression model was statistically significant ($F [5, 185] = 11.23, p < .001$), and there is no multicollinearity concern between variables based on VIFs less than 4 for variables. Because *Rankings* 1 indicates the top performance, we expect a negative relationship between *Rankings* and three variables of interest to support the first and second hypotheses. Similar to Table 3, the first column shows the results using the full sample, and the second and third columns show the results using two subsamples. When we use the full sample and the subsample with only power conferences, coefficients on *FBSP* are significant and negative at the 1% level, whereas coefficients on *Salaries* and *Bonus* are insignificant, which support only Hypothesis 2. When we use the subsample with non-power conferences, only the coefficient on *Salaries* is significant and negative at the 5% level, supporting Hypothesis 1. These results suggest that the final AP top 25 rankings in NCAA FBS programs are affected by annual spending on

football overall and when the teams are power conferences, but it is affected by the annual salary of head coaches when teams are non-power conferences. Taken together, our results support Hypotheses 1 and 2 and suggest that the higher compensation of head coaches and higher spending on football teams lead to better team performance.

Table 4

Regression Analysis 2

Dependent Variable = *Rankings*

	Full Sample		Only Power Conferences		Only Non-Power Conferences	
	Coef.	P value	Coef.	P value	Coef.	P value
<i>Intercept</i>	18.5582**	<.001	14.8750*	0.028	19.7274**	0.007
<i>Salaries</i>	-0.3245	0.494	-0.1111	0.821	-5.0000*	0.033
<i>Bonus</i>	-1.5800	0.409	-2.4400	0.234	4.9600	0.354
<i>FBSP</i>	-0.2063**	0.004	-0.2246**	0.003	0.1069	0.793
<i>Public_Sch</i>	3.1122	0.293	4.5934	0.503	3.5205	0.340
<i>Power_Conf</i>	-2.0589	0.215				
N	191		162		29	
F-Statistic	11.23**		8.54**		2.03	
Adj. R ²	21.21%		15.79%		12.88%	

* Statistically significant at .05 level.

** Statistically significant at .01 level.

Discussion and Implications

The findings of this study provide empirical support for the hypothesized relationship between financial investment and team performance in NCAA FBS programs. Consistent with agency theory, the results suggest that higher levels of overall program spending and head coach compensation are significantly associated with improved win percentages. These effects are particularly pronounced among programs affiliated with power conferences, where greater institutional resources and competitive pressures likely enhance the returns on financial investment. The positive association between head coach compensation and team performance aligns with previous research suggesting that competitive salaries may attract and retain coaching talent with a proven track record of success (Colbert & Eckard, 2015; Park et al., 2021). This supports the notion of pay-performance sensitivity, whereby higher compensation incentivizes behaviors that contribute to strategic goals such as winning games and improving national rankings. However, the finding that head coach salary is the only significant predictor of rankings in non-power conferences indicates that financial resources alone may not be sufficient to elevate these programs without targeted incentives or performance-based compensation structures.

Moreover, the differentiated effects between power and non-power conferences highlight the importance of institutional context. Power conference programs benefit from larger budgets, superior

infrastructure, and broader media exposure, which may amplify the performance effects of spending. In contrast, non-power conference programs may experience diminishing returns from general spending and instead rely more heavily on the strategic impact of coaching leadership. These dynamics underscore the complexity of the relationship between investment and performance and caution against one-size-fits-all approaches to budgeting and compensation.

From a practical standpoint, the results offer several implications for athletic departments and university administrators. First, investment in coaching staff, particularly through competitive base salaries and structured performance bonuses, can be an effective tool for enhancing team outcomes. Second, overall program spending should be viewed not only as a cost but as a strategic asset that contributes to sustained competitiveness, especially in high-profile conferences. However, decision-makers must also recognize that the effectiveness of financial investment is contingent upon institutional characteristics, resource availability, and the competitive environment. These results also enhance understanding in sport management by demonstrating how sustained financial investment shapes performance outcomes in collegiate football over time. As institutions continue to navigate the rising costs of athletic programs, understanding the nuanced relationship between spending and performance will be critical to informing policy and strategic planning.

Although the study provides valuable insights, it is not without limitations. The analysis does not account for unobservable variables such as coaching style, team culture, or alumni engagement, which may also influence performance. Additionally, the reliance on win percentage and AP rankings, while informative, may not capture all dimensions of success, such as academic outcomes or athlete development. Future research could expand the scope by incorporating recruiting performance, bowl game results, or athlete graduation rates as additional performance indicators. Further studies may also explore the effects of other forms of investment, such as assistant coach compensation, facilities, and recruiting budgets, to gain a more comprehensive understanding of performance drivers. Additionally, given the recent changes in NCAA policy regarding Name, Image, and Likeness (NIL), future studies should explore how institutional support for NIL opportunities influences recruiting outcomes, athlete performance, and overall program competitiveness. Investigating the financial and strategic implications of NIL across both power and non-power conferences could offer valuable insights into the evolving landscape of collegiate athletics.

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Appendix

Variable Definition

Variables	Definitions
Dependent Variables	
<i>WP</i>	Percentage of wins to the total number of NCAA football games in the annual season
<i>Rankings</i>	Final Associated Press (AP) top 25 rankings in NCAA Division I Football Bowl Subdivision
Independent Variables	
<i>Salaries</i>	Total annual salary of football head coach (in millions of dollars), adjusted for inflation to 2010 dollars using the Consumer Price Index (CPI)
<i>Bonus</i>	Total annual bonus of football head coach (in millions of dollars), adjusted for inflation to 2010 dollars using the Consumer Price Index (CPI)
<i>FBSP</i>	Total annual spending on football (in millions of dollars), adjusted for inflation to 2010 dollars using the Consumer Price Index (CPI)
<i>Public_Sch</i>	The indicator variable that is one for public universities and zero for non-public universities
<i>Power_Conf</i>	The indicator variable that is one for power conferences and zero for non-power conferences