

Predicting NCAA Division I Football Conference Winning Percentage: An Applied Resource Allocation Perspective

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Applied strategies to improve conference wins for NCAA Division I FBS football teams could have implications for increased resource acquisition, bowl berths, or inclusion in the lucrative college football playoffs. Unfortunately, aggregated research is lacking that identifies how administrators might prioritize such efforts, so that they may allocate their scarce resources to the most impactful areas. Thus, the purpose of this study was to investigate variables likely to impact conference winning percentage to provide practical insight for leaders embracing their role within managerial capitalism. Pearson correlations and multilinear OLS were applied to determine which descriptive, financial, and performance variables predict conference winning percentage. Football expenditures as well as coach success, recruit quality, and power conference membership were significantly predictive. Application of these results suggest conference winning percentage would likely increase as a result of targeted financial development leading to investments in recruiting and football expenditures, particularly in the power conferences.

Keywords: NCAA, Football Bowl Subdivision (FBS), college football, competitive balance, intercollegiate athletics

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Introduction

The landscape of intercollegiate athletics in the United States is rapidly changing as university leaders seek innovative ways to leverage competitive success and the revenue-generating capability of their athletic departments (Kaburakis, 2022). The National Collegiate Athletic Association (NCAA) Football Bowl Subdivision (FBS) is the most commercialized intercollegiate sport within the United States (Hill & Qu, 2019). Division I (DI) FBS schools include the power conferences (Atlantic Coast, Big Ten, Big Twelve, Southeastern) and those often referred to as Group of Five or mid-majors, with football programs from the power conferences being the largest and most resourced. In pursuit of increased influence and revenue, many universities have changed their conference affiliation, with several high-profile programs switching their power conference affiliation in 2024 (Cox, 2024).

The pursuit of revenue is expected because sport managers “must respond to political, social, economic, and technological changes for their organizations to remain financially viable” (Downs & Seifried, 2023, p. 19). Although an emphasis on resources led many university football programs to pursue conference realignment, the uneven distribution of resources within and outside the power conferences outlined in the \$1.3 billion agreement between the College Football Playoff and ESPN (Cobb & Dodd, 2024) suggests that sport managers would benefit from a better understanding of the relationship between capitalism and competitive balance.

Managerial capitalism is an ideal theoretical lens from which to view resource allocation in the highly resourced DI FBS. This concept suggests most control resides with salaried managers (i.e., athletic directors) rather than owners or shareholders of a company (Dumenil & Levy, 2018). Generally, managers work to maximize and enhance the output of skilled workers (Hall & Soskice, 2001), while simultaneously working to accumulate capital and develop markets, with an overarching goal of increasing revenue within the structure of contractual agreements (Levy, 2021). Capitalism is observable within intercollegiate athletics through the application of competitive balance, an agreement between parties to create outcome uncertainty, resulting in increased fan interest and overall league health (Runkel, 2022). Through managerial capitalism, college football success can be understood by how well resources are allocated to reach financial success.

Resource Allocation and Competitive Balance in NCAA DI Football

The number of variables that could affect football wins within the disproportionately resourced DI FBS is robust. It is beyond the scope of this work to examine all such

resources. Instead, this work is focused on select variables that could potentially influence football success as part of the larger body of competitive balance knowledge. Revenue structures, for example, are implemented as a means of equalizing the revenue between conference schools (Bergman & Logan, 2020). Stadium size was linked to parity when Fullagar et al. (2019) estimated that for every additional 10,000 fans, home teams gain a point total advantage, while Anderson (2017) found that every \$1 million spent by athletic departments can increase winning percentage. When resources are funneled to infrastructure, there is evidence of a brief novelty effect as well as a small increase in revenue (Soebbing et al., 2022). Coaches utilize the renovations to recruit on the future success from those upgrades (Caro, 2023; Huml et al., 2018).

Recruiting is an important component of intercollegiate football, particularly in the age of compensating players for their name, image, and likeness (NIL). Programs are required to follow the same recruiting calendar, which helps to ensure competitive balance. The most well-resourced programs, however, can spend more money in recruiting, often resulting in better recruits and on-field success (Bergman & Logan, 2020; Caro, 2012; Huml et al., 2018). This process creates a cycle wherein money spent in recruiting can build long-term success for a program, with athletic department spending outpacing revenue (Atwater et al., 2023; Caro, 2012). Recruiting budgets can be a powerful investment given there is evidence that recruiting practices are responsible for 63-80% of a team's athletic success (Caro, 2012).

Both practitioners and researchers have noted the importance of multi-million dollar facility construction to attract recruits, coaches, and donations (Atwater et al., 2023). Donations are another source of revenue for athletic departments, with successful programs often realizing more donor resources (Humphreys & Mondello, 2007; Stinson & Howard, 2007). Donations to athletic departments may also lead to competitive imbalance, although there are limits on how many tickets or corporate sponsorships can be sold (Wanless & Stinson, 2020), there is no limit on the money that university athletic departments can generate through fundraising and donations. These subsequent increases in capital may increase player quality, which, in turn, can produce higher revenue (Bergman & Logan, 2020; Caro, 2023). In aggregate, research has indicated there is a relationship among recruiting, resource allocation, and success (Atwater et al., 2023; Bergman & Logan, 2020; Caro, 2023).

To compete with top programs, lower-resourced programs will have to increase their spending (Atwater et al., 2023). Given the ever-increasing expenditures, many are allocating revenue from the university (i.e., student fees) to offset spending (Jablonski et al., 2022). This proposition puts some universities, athletic departments, and football programs in a difficult position relative to

resource allocation. Thus, a nuanced understanding of the variables that best predict success can help football program administrators target the allocation of their limited resources. This study investigated which variables had the greatest impact on conference winning percentage in Division I FBS football. Accordingly, the following hypotheses were generated:

H1: Financial variables will have the most significant relationship with conference winning percentage.

H2: Financial variables will be more predictive of conference winning percentage than descriptive or performance variables.

Method

A descriptive analytical historical design (Sterling et al., 2017) was used to evaluate archival data for 1,795 cases collected between 2008 and 2022. The starting point was chosen so that adequate data could be collected while all variables were available for data mining and the ending point, because it was the last year with all available data. Each case was determined by FBS football program and year. For example, Team A in 2010 was separate from Team A in 2011, allowing for independent consideration of conference realignment from year to year.

The research design collected three types of independent variables, (a) descriptive, (b) financial, and (c) performance, with a summary of each variable listed in Table 1. Coaching records, descriptive variables, and coach winning percentages from all FBS football programs were collected via athletic department online media guides. Financial variables were collected using the Knight Commission online financial database. The Equity in Athletics Data Analysis database provided the ticket sales, football expenditures, and athletic department revenue. Renovation project data were collected using university newspapers and media guides. The total amount spent on the renovation by the year of completion was split into four categories (< \$1 million, \$1-30 million, \$31-79 million, and >\$80 million). Due to renovations occurring over multiple years and original expenditure totals not always matching the completion cost, the total dollar amount was recorded based on completion of the project. The Knight Commission database provided the recruiting budget and donations to the football program. Rivals recruiting score was gathered from rivals.com.

Data Analysis

Data were analyzed using SPSS. Frequency counts and measures of central tendency were calculated to provide the context of competitive balance. Pearson

Table 1. Description of Dependent Variables

Variable Type	Dependent Variables	Description
<i>Descriptive</i>	Power Schools or Non-power Schools	Participation in a Power conference
	Conference	Conference of competition
	Seating Capacity	Football stadium seating capacity
<i>Financial</i>	Ticket Sales	Total revenue derived through ticket sales
	Recruiting Budget	Total amount of money available for recruiting
	Donations to Athletic Department	Total amount of money donated to the athletic department
	Football Expenditures	Total amount of money spent by the football program
	Renovation Projects	Number and level of renovations to football facilities
	Athletic Department Revenue	Total money generated by the football program
<i>Performance</i>	Coach Winning Percentage	Coach's conference winning percentage
	Rivals Recruiting Score	Average recruiting class rank from 0-5

correlations were used to determine the strength of relationships among all independent variables and the dependent variable of conference winning percentage. Both hypotheses were tested by ordinary least squares (OLS) multiple regression to determine how much each variable contributed to predicting conference winning percentage. Many rivals recruiting scores from smaller non-power schools with few ranked players were missing, and most schools had not engaged in renovation projects, so these variables were removed from the analysis. Additionally, the coaches' single year win percentage was removed from the final analysis because of its overwhelming influence on conference winning percentage. These adjustments allowed the other variables to provide a more accurate level of prediction. All assumptions were met for statistical analyses and all variables were evaluated based on units of \$1 million, except for seating capacity, where 10,000 seats equaled one unit.

Results

Descriptive results are presented in Table 2 and separated by Power and Non-Power conferences. The number of Power ($n = 925$) and Non-Power ($n = 870$) cases were similar. Other noteworthy results included mean ticket sales of

\$12,494,719, mean rivals ranking 2.93/5, mean football recruiting expenditures of \$778,696, and a mean difference of approximately \$17 million between power and non-power football expenditures. Regarding correlations (see Table 3), for the dependent variable of conference win %, eight of the 11 variables included were significantly related ($p < 0.05$). Conference and renovation projects were not significantly related to conference winning percentage; however, the other financial variables were all significantly related. Similarly, the performance variables of coaching win percentage and rivals recruiting score were both significant. Other notable relationships include every variable except renovation projects being significantly related to conference, and very strong relationships among the financial variables, particularly revenue. Moreover, football spending was significantly related to every other variable ($p < .01$). Given these results, H1 was rejected because financial variables did not demonstrate significantly stronger relationships than performance variables. Financial variables did, however, demonstrate strong overall relationships, particularly relative to descriptive variables.

Table 2. Descriptive Information for Variables Under Investigation

	Power Conferences	Non-Power Conferences	Total
<i>Conference</i>	<i>N</i> = 925	<i>N</i> = 870	1795
<i>Seating Capacity</i>	<i>M</i> = 67,310 <i>SD</i> = 19,709	<i>M</i> = 36,367 <i>SD</i> = 13,544	<i>M</i> = 52,241 <i>SD</i> = 22,973
<i>Ticket Sales</i>	<i>M</i> = 22,588,376 <i>SD</i> = 13,003,225	<i>M</i> = 3,132,794 <i>SD</i> = 3,275,466	<i>M</i> = 12,924,838 <i>SD</i> = 13,603,621
<i>Recruiting Budget</i>	<i>M</i> = 1,174,368 <i>SD</i> = 719,335	<i>M</i> = 388,513 <i>SD</i> = 211,326	<i>M</i> = 795,142 <i>SD</i> = 665,907
<i>Donations to Athletics</i>	<i>M</i> = 24,481,900 <i>SD</i> = 17,314,400	<i>M</i> = 4,124,600 <i>SD</i> = 3,553,090	<i>M</i> = 14,256,600 <i>SD</i> = 16,097,100
<i>Football Expenditures</i>	<i>M</i> = 27,522,098 <i>SD</i> = 12,104,425	<i>M</i> = 10,236,109 <i>SD</i> = 4,627,140	<i>M</i> = 19,185,524 <i>SD</i> = 12,680,099
<i>Renovation Projects (rounded to millions)</i>	<i>M</i> = 2.29 <i>SD</i> = 1.13	<i>M</i> = 1.76 <i>SD</i> = .92	<i>M</i> = 2.05 <i>SD</i> = 1.01
<i>Athletic Department Revenue</i>	<i>M</i> = 104,356,946 <i>SD</i> = 4,696,1411	<i>M</i> = 34,788,691 <i>SD</i> = 13,908,531	<i>M</i> = 69,436,231 <i>SD</i> = 49,044,691
<i>Coach Winning Percentage</i>	<i>M</i> = .557 <i>SD</i> = .210	<i>M</i> = .481 <i>SD</i> = .221	<i>M</i> = .520 <i>SD</i> = .218
<i>Rivals Recruiting Score</i>	<i>M</i> = 3.09 <i>SD</i> = .40	<i>M</i> = 2.26 <i>SD</i> = .44	<i>M</i> = 2.93 <i>SD</i> = .53

Table 3. Pearson and Point Biserial Correlations (and Significance Levels) for Variables Under Investigation

	Conference Win %	Power vs. Group	Conference	Seating Capacity	Ticket Sales	Recruiting Budget	Football Spending	Renovation Projects	Donations	Total Athletic Revenue	Coach All Time Win %	Rivals Recruiting
<i>Conference Win %</i>	1.00											
<i>Power vs. Non-Power</i>	.006 (.805)	1.00										
<i>Conference</i>	.020 (.395)	.857 (<.01**)	1.00									
<i>Seating Capacity</i>	.143 (<.01**)	-.673 (<.01**)	-.510 (<.01**)	1.00								
<i>Ticket Sales</i>	.136 (<.01**)	-.715 (<.01**)	-.574 (<.01**)	.822 (<.01**)	1.00							
<i>Recruiting Budget</i>	.051 (.031*)	-.590 (<.01**)	-.487 (<.01**)	.585 (<.01**)	.597 (<.01**)	1.00						
<i>Football Spending</i>	.142 (<.01**)	-.681 (<.01**)	-.560 (<.01**)	.716 (<.01**)	.704 (<.01**)	.804 (<.01**)	1.00					
<i>Renovation Projects</i>	.049 (.421)	-.247 (<.01**)	-.113 (.064)	.204 (<.01**)	.226 (<.01**)	.340 (<.01**)	.359 (<.01**)	1.00				
<i>Donations</i>	.135 (<.01**)	-.633 (<.01**)	-.494 (<.01**)	.654 (<.01**)	.688 (<.01**)	.415 (<.01**)	.674 (<.01**)	.246 (<.01**)	1.00			
<i>Athletic Department Revenue</i>	.104 (<.01**)	-.709 (<.01**)	-.586 (<.01**)	.739 (<.01**)	.790 (<.01**)	.608 (<.01**)	.800 (<.01**)	.336 (<.01**)	.782 (<.01**)	1.00		
<i>Coach Win %</i>	.906 (<.01**)	-.474 (<.01**)	-.110 (<.01**)	.290 (<.01**)	.294 (<.01**)	.182 (<.01**)	.276 (<.01**)	.090 (.141)	.263 (<.01**)	.249 (<.01**)	1.00	
<i>Rivals Recruiting</i>	.294 (<.01**)	-.629 (<.01**)	-.373 (<.01**)	.785 (<.01**)	.691 (<.01**)	.499 (<.01**)	.641 (<.01**)	.240 (<.01**)	.580 (<.01**)	.623 (<.01**)	.394 (<.01**)	1.00

The first attempt at OLS multiple regression after removing cases with missing data resulted in 653 complete cases. Before its removal, the coaches' single year winning percentage accounted for 85% of the variance in conference winning percentage. Thus, removing rivals rankings, renovations, and coach winning percentage allowed for more complete cases and more sensitive analysis of the remaining variables. The final OLS model using conference winning percentage as the criterion variable revealed a total of 1,193 complete cases with an R-square value of .10 ($F[18, 1175] = 6.98, p < .01$). Five of seven variables under investigation were significant predictors of conference winning percentage ($p < .01$; see Table 4). Given that three of four financial variables aided in significantly predicting conference winning percentage, and the strongest predictor was football expenditures, H2 was accepted.

Table 4. Ordinary Least Squares Regression Predicting Conference Winning Percentage

Variable	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
<i>Power vs. Non-Power</i>	-18.231	2.557	-.341	-7.131	<.001**
<i>Seating Capacity (per 10,000 seats)</i>	.143	.706	.013	.203	.839
<i>Ticket Sales (in millions)</i>	.352	.137	.176	2.566	.010*
<i>Recruiting Budget (in millions)</i>	-12.284	2.622	-.249	-4.685	<.001**
<i>Donations to Athletics (in millions)</i>	.361	.100	.186	3.618	<.001**
<i>Football Expenditures (in millions)</i>	.935	.157	.393	5.937	<.001**
<i>Athletic Department Revenue (in millions)</i>	-.043	.031	-.076	-1.381	.168

* = < .05; ** = < .01

Implications

This study sought to determine which variables aid in predicting conference winning percentage in FBS football. A particular emphasis was placed upon financial variables as intercollegiate athletic administrators increasingly operate as capitalists in a competitive marketplace with uncertain regulations. Findings suggest that conference winning percentage is correlated to nearly all

the variables examined, particularly the performance and financial variables. Although the strength of relationships with the financial variables relative to performance variables was not enough to substantiate H1, financial variables were the most predictive of winning, which supported H2. These findings are consistent with a capitalist system where financial investment and the development of talented employees are of particular interest to managers (Hall & Soskice, 2001), in addition to Anderson's (2017) finding that increased spending leads to greater winning, especially investments in recruiting (Caro, 2012, 2023). The correlation between winning and recruiting, as well as the high B value for recruiting budget, support Caro's (2012) contention that as much as 80% of a football program's success relies on elements of recruiting. In the interest of transparency, the inability to include rivals scores in the prediction model due to missing data is pragmatically noteworthy. The strong relationship of this variable in addition to the strong predictive value of recruiting budget indicates recruiting should be a critical part of resource allocation.

The data also supports that college football programs, when viewed separately from the rest of the athletic department, may win more when pursuing a business strategy that emphasizes increased spending to attain greater revenue to reinvest back into the program. Moreover, results suggest sport stadium facility spending should not be prioritized when pursuing wins, as facility renovations and seating capacity did not significantly predict winning. Coupled with previous findings that facility renovations generate little revenue (Soebbing et al., 2022) and new or renovated facilities are not of particular importance to recruits (Huml et al., 2018), it could be wise for sport managers to allocate resources elsewhere. Though Fullagar et al. (2019) determined facility capacity leads to competitive advantage, the results of this study suggest that ticket revenue is more important than capacity, with power conference programs generally having greater potential ticket revenue due to greater stadium capacity.

Pragmatically, intercollegiate athletic administrators looking to increase influence and revenue through football should increase ticket prices, the football recruiting budget, and football program spending overall. Specifically, in the order of predictive impact, the unstandardized results suggest that being a Non-Power school would decrease win percentage by 18.23%. Financially, each \$1 million in ticket sales increases win percentage by 0.35%, each \$1 million in recruiting costs decreases win percentage by 12.28%, each \$1 million in football expenditures increases win percentage by 0.94%, and each \$1 million in donations to athletics increases win percent by 0.36%. Moreover, it is noteworthy that football expenditures were the most powerful predictor. Specifically, for every \$10 million spent on football expenditures winning percentage increases by nearly 10%, or the equivalent of roughly one game in a 10-game conference

season. These results underscore the applied nature of these findings from a resource allocation perspective.

While administrators have recognized the importance of increased spending for football success (e.g., Atwater et al., 2023), an empirically-supported, quantitative approach has been lacking. Qualitatively, organizational emphasis on development and fundraising as a primary means to achieve strategic objectives has been suggested as essential for NCAA Division II athletic departments at Historically Black Colleges and Universities (Elliott & Williams, 2024). Using the available data, Division I FBS administrators should expand their development staff to pursue more donations, particularly targeting funds that can be used discretionally as NIL agreements and direct payments evolve. These resources can also be used to secure the money necessary to acquire quality personnel. As a general sales principle, properties seeking to expand should hire sales staff, or in the context of increasing revenue to reinvest into the football program, cultivate donors via hiring development staff (Dees et al., 2022). Successful programs generate more money in donations (Humphreys & Mondello, 2007; Stinson & Howard, 2007) and recent analysis of donor behavior in the NIL era further supports the importance of cultivating donors that continue donating to the athletic department after NIL donations (Akabas & Novy-Williams, 2024). Overall, increasing development staff is a reasonable course of action for any athletic department and particularly those looking to improve resources for the football program.

Though the application of results is the primary focus, it is important to also note theoretical implications. Managerial capitalism affirms how the results can be used to allocate resources for athletic and financial success, but other theoretical positions could build from this work as well. For example, organizational behavior theorists could use the information to evaluate asset allocation relative to departmental values or leadership philosophies. Those interested in resource dependence theory could explore donor, alumni, or sponsorship variables critical to shaping department outcomes. Institutional isomorphism could be better understood, especially relative to resources acquired or lost when moving conferences or divisions. No matter the approach, the results are potentially generalizable beyond DI FBS football as they pertain to resources and competitive balance of different sports, divisions, or international sport systems.

Conclusion

Viewed through the lens of managerial capitalism, this work confirms the importance of financial resources in securing quality coaches and players. Given the greater sums of money associated with power conferences, administrators seeking to improve their conference winning percentage (and by association program prestige), should enhance development efforts to secure additional

revenue. These efforts may be particularly important in football, as direct football expenditures were the most powerful predictors of conference winning percentage. Looking forward, sport managers should consider the descriptive, financial, and performance variables as more data from NIL and direct player compensation become available, especially in Power conferences where financial resources are more abundant.

As part of the changing landscape of college athletics, revenue generation in the midst of rapidly increasing operational expenses becomes paramount for administrators (Kaburakis, 2022). This point is critical to the future of intercollegiate sport where the recently affirmed *House v. NCAA* (2025) ruling allows direct university payments to college athletes and intersects with emerging trends in NIL legislation, labor practices, and revenue-sharing models. These additional expenses will challenge many of the less-resourced DI FBS programs to further parse funds for maximum benefit.

Future research should continue to examine administrators' roles in securing and allocating their (often scarce) resources in functional areas and departmental activities that are most likely to produce wins. These wins can lead to increased applications and enrollment for the school (Baumer & Zimbalist, 2019), which can increase the resources from student fees, in addition to the possible increases in media and sponsorship rights (Kaburakis, 2022) available to athletics departments. More than ever, it appears athletic departments are leaning toward a corporate model where managerial capitalism and professionalization guide resource allocation.

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