

The Relationship Between Sport Expense and Competitive Success

By Dr. Adam Cocco, Anthony Montanaro, and Alan Grosbach

A 2022 [ROA research brief](#) delivered a first look at the relationship between sport expense and competitive success among NAIA institutions. This initial analysis showed the amount spent on a sport team showed approximately a 10-25% of the difference in winning percentages between teams in each sport. Additionally, the relationship between sport expense and winning percentage was generally stronger for women's sport teams compared to men's sport teams.

Practical Considerations:

- ▼ Considering your current level of sport expense, are you satisfied with your institution's level of competitive success within athletics? Why or why not?
- ▼ Which sport programs provide your institution with the largest amount of NACDA Directors' Cup points? Are those sports also the ones with the highest level of expense?
- ▼ Which sport programs provide your institution with the lowest degree of competitive success? Are there opportunities to increase investment into those sports?
- ▼ Most NAIA institutions spend about \$3,000 to \$5,000 per student-athlete. If your institution is outside of this range, is there an opportunity to reallocate some of your athletic department spend to potentially increase the competitive success of your institution?

However, last year's analysis was limited based on its definition of the term "competitive success", which was a team's winning percentage during the previous season. This caused two main limitations. First, it did not account for postseason success and second, it only allowed for the inclusion of team sports since winning percentages are more difficult to quantify within individual sport competitions. Therefore, last year's research brief only included data from the following 11 team sports: baseball, men's/women's basketball, football, men's/women's lacrosse, men's/women's soccer, softball, and men's/women's volleyball.

To address this issue, the current research brief utilizes data from the 2021-22 National Association of Collegiate Directors of Athletics (NACDA) Directors' Cup standings to provide a more holistic measure of competitive success among NAIA athletic departments.

The NACDA Directors' Cup awards points to an institution based on performance across a broad range of men's and women's sport competitions¹. The exact number of points awarded for each sport depends on whether it is an individual or team sport and the number of



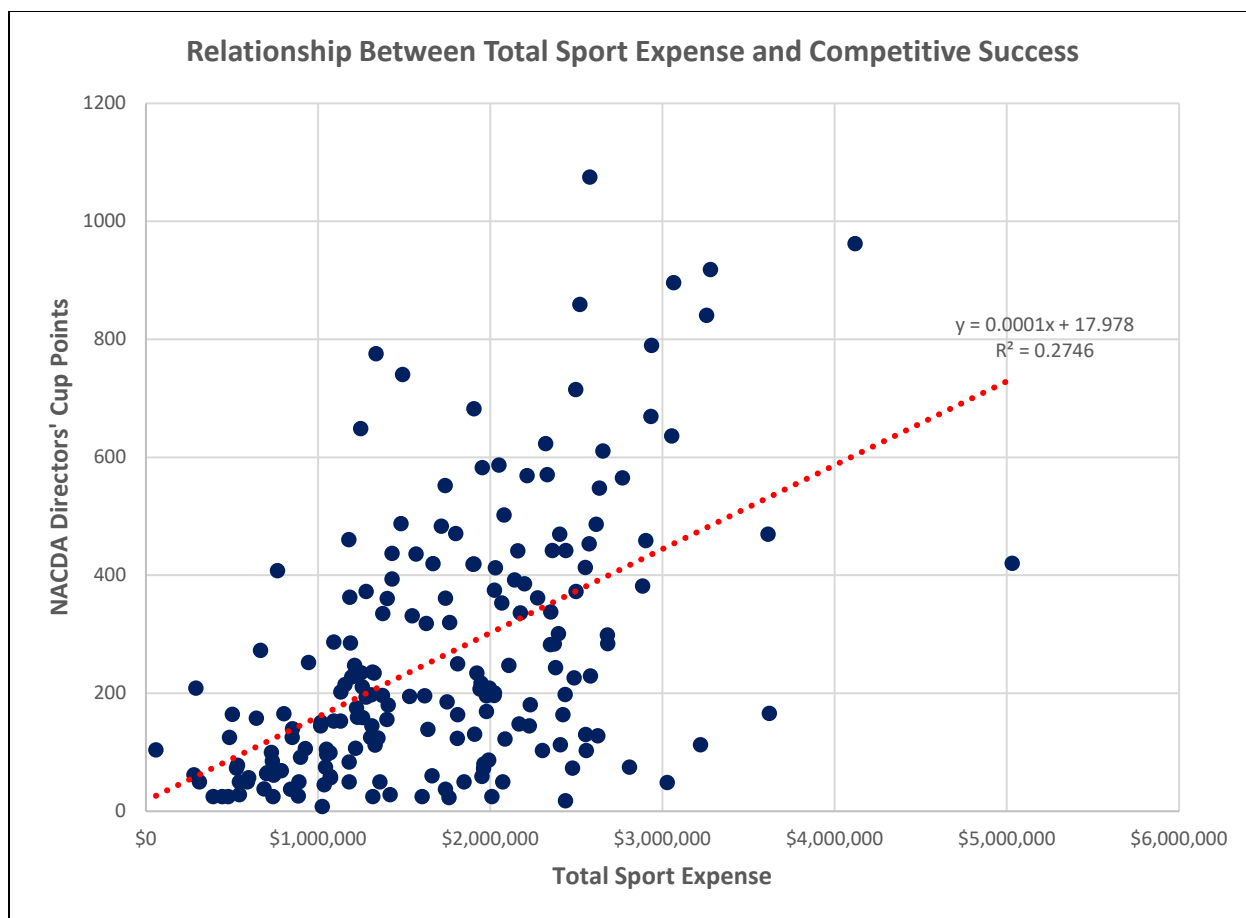
teams/competitors that qualify for postseason competition^{2 3}. In general, a higher amount of NACDA Directors' Cup points indicates a greater degree of competitive success for an athletic department.

The NACDA Directors' Cup awards points for success within 22 different sport programs. This includes five men's team sports (baseball, basketball, football, soccer, and volleyball), four women's team sports (basketball, soccer, softball, and volleyball), six men's individual sports (cross country, golf, swim & dive, tennis, track & field, and wrestling), five women's individual sports (cross country, golf, swim & dive, tennis, and track & field), and two sports where both genders compete (competitive cheer and competitive dance).

The sport expense metric utilized in this analysis comprises four categories of expense: personnel, operating, postseason, and recruiting. Overall, the average NAIA athletic department incurred an expense of roughly \$2.2 million during the 2021-22 academic year. Approximately 95% of this cost was designated as a personnel or operating expense.

Overall, the findings from this year's analysis demonstrate a strong correlation between the amount spent by an NAIA athletic department and its competitive success as determined by NACDA Directors' Cup points accumulated. The graph presented below visualizes the nature of this relationship. The R^2 value depicted on the graph indicates that approximately 27.5% of the difference in NACDA Directors' Cup points accumulated between NAIA athletic departments can be explained by the amount spent on sport programs included in this analysis.





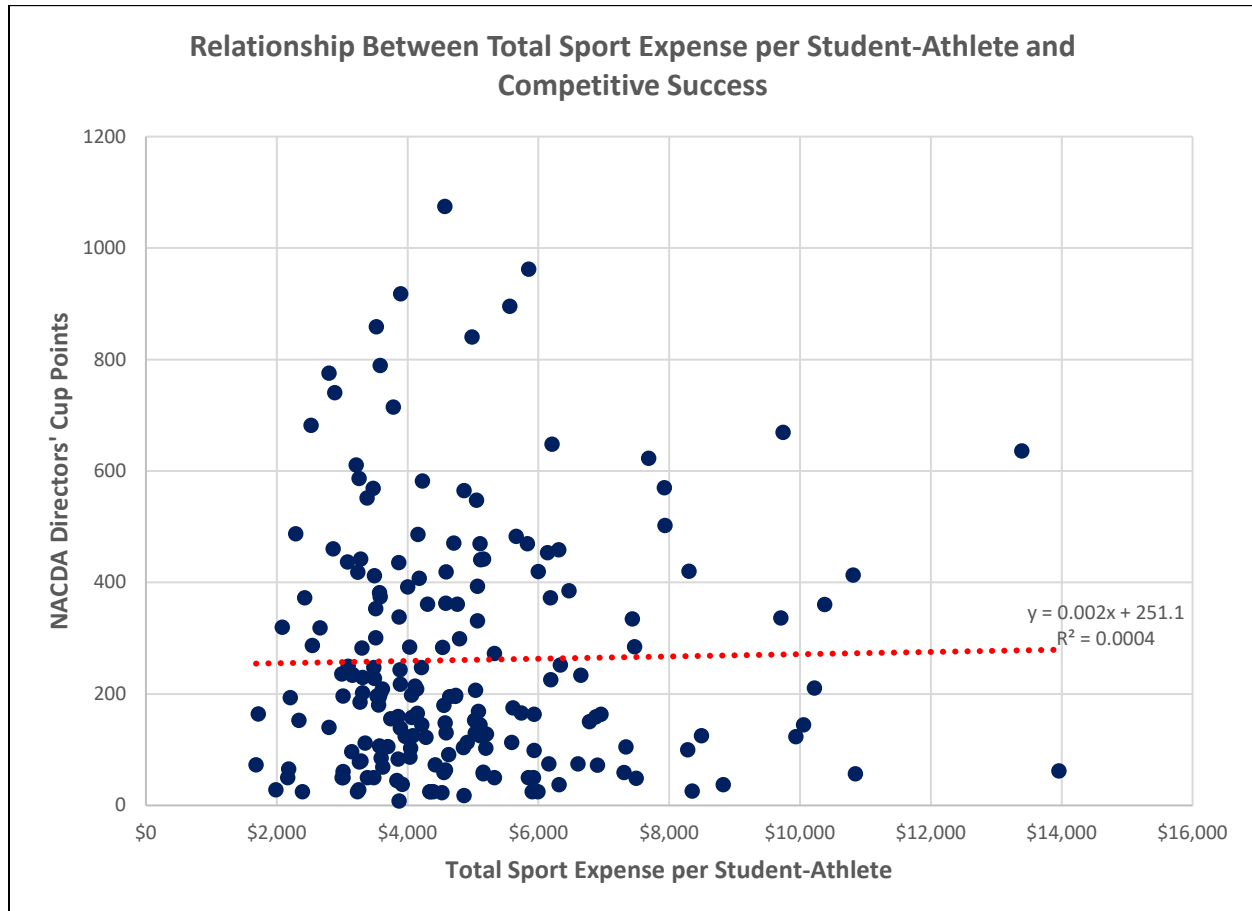
From this analysis, it is possible to extrapolate predictions on the amount of NACDA Directors' Cup points an NAIA athletic department should accumulate at various levels of sport expenditure. The table below presents these predictions for sport expenditures between \$1 million and \$5 million at increments of \$1 million.

Sport Expenditure	Projected NACDA Cup Points	Competitive Success Percentile
\$1 million	160.15	43.90%
\$2 million	302.33	67.30%
\$3 million	444.50	82.70%
\$4 million	586.68	91.80%
\$5 million	728.85	95.60%

For example, if an NAIA athletic department were to spend \$2 million during an academic year, this analysis projects it would accumulate about 302 NACDA Directors' Cup points, which would translate to a better performance than 67.30% of all other NAIA institutions. An institution spending \$5 million would predict about 729 NACDA Directors' Cup points, making that institution more competitively successful than 95.6% of all other NAIA institutions.



The analysis provided above utilizes total sport expense. However, is there a different impact on competitive success when sport expense is normalized on a per student-athlete basis? The graph below depicts the relationship between sport expense per student-athlete and the competitive success of an athletic department.



The red trendline in the graph above indicates there is almost no discernable relationship between sport expense per student-athlete and the competitive success level of an NAIA institution. Therefore, it is possible to conclude that an NAIA institution's competitive success, as measured by performance in the NACDA Directors' Cup, is more a function of the overall size and scope of the athletic department rather than targeted spending on a relatively few number of athletic teams. In sum, if an NAIA athletic department has a desire to increase their competitive success, it is best to grow the overall size of the athletic department through investment in more sports and athletes rather than spending more on the same amount of athletes already at the institution.

Finally, a correlation analysis was performed to assess the direction and magnitude of the relationship between sport expense and competitive success for each of the 22 sport programs included within the NACDA Directors' Cup standings. Unsurprisingly, there was a positive relationship between these metrics for each sport program included in the analysis. However, there were significant differences between sport programs in the magnitude of the relationship



between sport expense and competitive success, with some indicating a stronger relationship (as indicated by a correlation coefficient relatively closer to 1) and others displaying a weaker relationship (as indicated by a correlation coefficient closer to 0). The table below displays the full results of this analysis.

Sport	Correlation Coefficient	Average Expense
Men's Swim & Dive	0.60	\$61,127
Women's Swim & Dive	0.59	\$61,377
Men's Wrestling	0.55	\$127,596
Women's Basketball	0.53	\$148,532
Women's Track & Field	0.51	\$66,122
Women's Golf	0.47	\$53,615
Women's Tennis	0.47	\$46,302
Women's Soccer	0.45	\$114,987
Baseball	0.47	\$210,066
Men's Golf	0.41	\$58,931
Competitive Dance	0.41	\$41,045
Men's Track & Field	0.39	\$69,868
Men's Tennis	0.38	\$45,642
Men's Volleyball	0.35	\$86,282
Men's Soccer	0.33	\$118,623
Women's Cross Country	0.32	\$32,608
Men's Cross Country	0.32	\$33,859
Men's Basketball	0.30	\$176,392
Softball	0.26	\$133,525
Women's Volleyball	0.24	\$112,809
Competitive Cheer	0.24	\$50,956
Football	0.11	\$517,768

As indicated in the table above, men's and women's swim & dive showed the strongest relationship between the amount an NAIA institution spent on those sport programs and the level of competitive success generated based on that spend. Interestingly, the sport programs with the strongest relationship between sport expense and competitive success tend to be individual sport competitions (e.g., men's/women's swim & dive, men's wrestling, and women's track & field) while team sports tend to display the weakest relationship between spend and competitive success (e.g., softball, women's volleyball, and football).

There was a particularly weak relationship between sport expense and competitive success for football, which had a correlation coefficient of only 0.11. This is likely a function of the high expense associated with NAIA football programs (\$517,768 on average, more than double any other sport program) and the relatively few number of football programs that progress to postseason play (16) and are therefore eligible for incremental NACDA Directors' Cup points.



Finally, it is worth noting that women's sport programs tend to display a stronger relationship between sport expense and competitive success, with six of the top eight strongest relationships occurring within women's sport programs (swim & dive, basketball, track & field, golf, tennis, and soccer). This corroborates findings from last year's analysis regarding the stronger relationship between sport expense and competitive success for women's sport programs compared to men's sport programs.

Key Takeaways:

- ▼ There is a strong, positive, and significant relationship between total sport expense and NACDA Directors' Cup points accumulated by an NAIA institution. Approximately 27.5% of the difference in NACDA Directors' Cup points between institutions can be explained by the amount spent on sport programs.
- ▼ There does not appear to be a similarly significant relationship between sport expense per student-athlete and competitive success. Therefore, an NAIA institution seeking to improve the successfulness of its athletic department should increase the overall size of its department rather than spend more on the same amount of sport programs and athletes already at the institution.
- ▼ There is a relatively stronger relationship between sport expense and competitive success among individual sport programs compared to team sport programs.
- ▼ There is a relatively stronger relationship between sport expense and competitive success among women's sport programs compared to men's sport programs.
- ▼ The weakest relationship between sport expense and competitive success occurred with football. This is likely due to the high expense related with that sport and the relatively few opportunities for postseason qualification.

References:

¹ <https://nacda.com/sports/2018/7/17/directorscup-nacda-directorscup-current-scoring-html.aspx?id=715>

² <https://nacda.com/sports/2018/7/17/directorscup-nacda-directorscup-scoring-html.aspx>

³ https://nacda.com/documents/2018/6/14/_nacda_directorscup_2012_13_misc_non_event_dc_scoring.pdf

