

The Impact of Institutional Characteristics on Total Debt Outstanding on
Athletic Facilities: Toward a New Paradigm

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Abstract

Public perception of many intercollegiate athletic programs is one of uninhibited spending, “stealing” money from academic initiatives, and high profile revenue generating sports spending so much that non-revenue generating sports cannot survive. This paper has two purposes. The first purpose is to demonstrate that not all institutions participate in the athletic spending “arms race” at equal rates. Specifically, institutional characteristics (Carnegie Classification and selectivity) will be tested to determine if either or both are related to total debt outstanding on athletic facilities, controlling for institutional wealth using instructional spending per FTE as a covariate. Second, the Carnegie Classification system is compared to an alternative classification model, developed by Ott and Lawrence (2013), to determine if the results vary depending upon the classification scheme.

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The term “arms race” historically describes competition among nations fighting for military power. However, this term has become common vernacular when referring to athletic spending in higher education. Recruitment of student-athletes is commonly referred to as a “recruiting war.” Coaches “race” to be the first to offer scholarships to young athletes. Institutions build new athletic facilities to “compete” with other institutions in terms of size and lavish amenities. Highly visible sports, such as football and basketball are marketed by both institutions and national media to increase fan attendance and sales of institutionally affiliated products. To fund these “wars,” institutions continually look to raise money through increased revenues and donor contributions. This picture of intercollegiate athletics shapes a commonly held perception that athletic departments are engaged equally in this race and spending without regard for fiscal accountability.

This common perception about athletic spending is increasingly at odds with the growing emphasis on accountability in higher education. Accrediting agencies now hold institutions more accountable for producing measurable student outcomes consistent with stated institutional mission statements and goals. Additionally, while state support for higher education has seen a recent marginal increase, state funding for public higher education is still lower per FTE in 2015 than it was in 2008. Even recent increases in funding are influenced by state anomalies (Illinois) and overall, thirty-seven states have

decreased funding over the last 10 years (State Higher Education Executive Officers, 2016).

Considering the public perception of overspending in intercollegiate athletics, this research sought to investigate the pervasiveness of these practices across various institutional types. This approach is consistent with most research on higher education, using Carnegie Classification categories as the basis for institutional types. Using total debt outstanding on athletic facilities for this analysis provided a measure of fiscal accountability by athletic departments and is tied to overall institutional fiscal health.

While the primary purpose of this research was to differentiate institutional type, a subsequent question asked if Carnegie categories are the most appropriate for athletic metrics. Of specific interest is the alternative categories proposed by Ott and Lawrence (2013). This classification system is based on institutional and athletic characteristics for FBS schools. The four institutional types in this system are:

- FBS Extensive Athletics: Level One,
- FBS Extensive Athletics: Level Two,
- FBS Intensive Athletics: Level One,
- FBS Intensive Athletics Level Two.

Larger programs with greater athletic expenditures were clustered in the two extensive categories (the main difference being lower graduation rates in the Level Two schools). The intensive schools tend to have smaller overall enrollments with less athletics expenditures and lower levels of athletic success. Level Two schools in this group tend to have lower levels of student-athlete academic performance.

The current study investigated the phenomena of the “arms race” in athletic spending by distinguishing athletic facility debt incurred as a function of two institutional

characteristics. The specific research question guiding this study asked if total debt outstanding on athletic facilities is impacted by institutional mission (measured by Carnegie Classification) and institutional selectivity (measured by dividing the number of undergraduate students offered enrollment as first year students by the total number of applicants). Because institutional wealth may be related to spending, variability due to wealth is controlled for by including instructional spending per student in the analysis.

A second purpose of this study was to extend the model using the classification system developed by Ott and Lawrence (2013). Using the same statistical model but substituting the Ott and Lawrence classification scheme for Carnegie Classification categories provided the opportunity for the two classification schemes to be compared.

Conceptual Framework

There are many theories in higher education linking institutional characteristics to various institutional outcomes (Astin, 1984; Berger and Milem, 2000; Pascarella, 1985; Weidman, 1989). The conceptual framework in Figure 1 applies these theories to guide the research in an effort to understand the fiscal responsibility of athletic programs. The conceptual framework also includes the important covariate of institutional wealth.

While this variable is not of interest to the study, including wealth addresses a possible confounding variable between spending and wealth. Hence any relationship between institutional wealth and total debt outstanding will be accounted for in the model.

Finally, the conceptual framework allows for the substitution of an alternative classification system that may allow institutions to select peer schools with more closely aligned athletic structures.

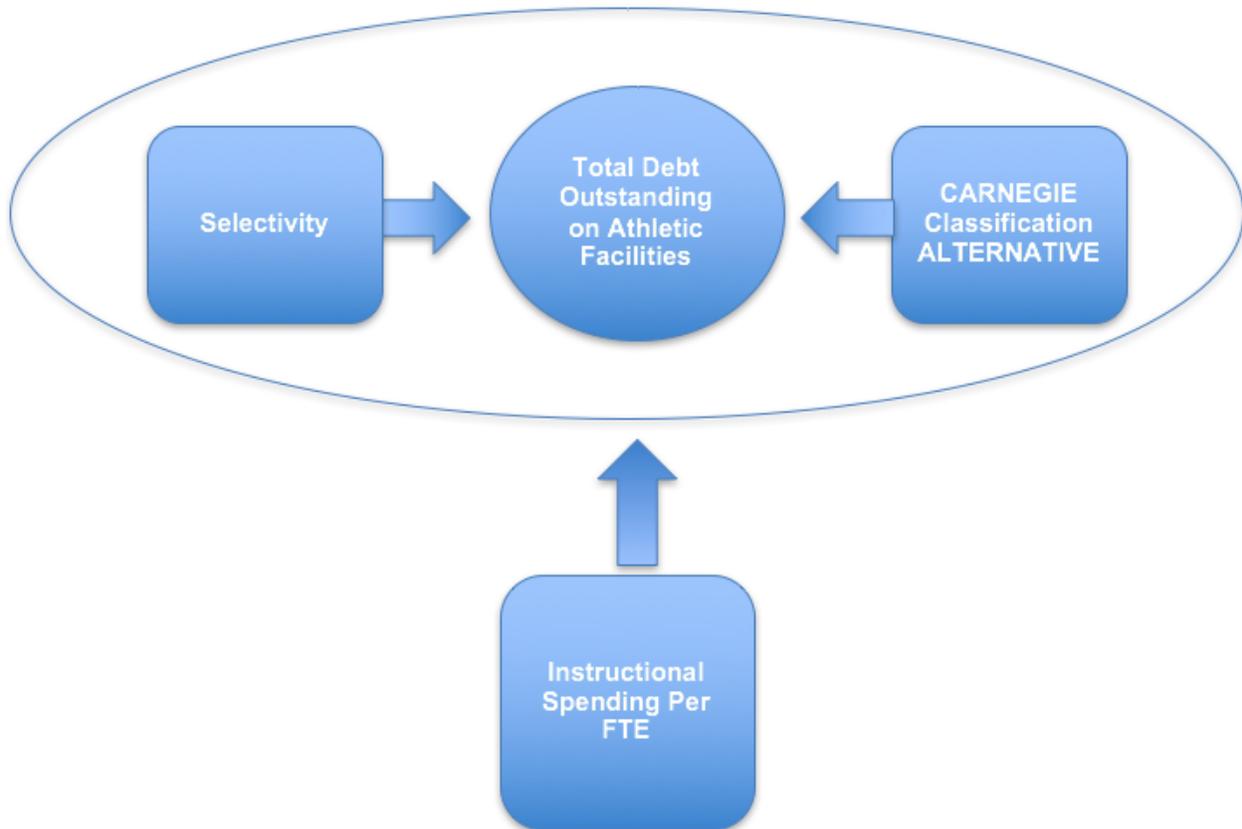


Figure 1. Conceptual Framework

Literature Review

The popular media holds a perception that intercollegiate athletics is all about big-time football and highly paid coaches (Earl, 2004; Gerdy, 2002). The current state of affairs focuses media and public attention on these phenomena, such as the simultaneous announcement of stadium expansions and institutional budget cuts (Earl, 2004). Only through deliberate efforts, such as the inclusion of women's sports into the Learfield Directors Cup, are these stereotypes of intercollegiate athletics being challenged. The idea of differentiation in the structure and function of intercollegiate athletic programs in higher education is one that deserves merit, particularly in times of

increasing scrutinizing of athletic programs (Gerdy, 2002). The concept of differences in institutional type is not new to the higher education literature. The writings and results of multiple theorists and researchers (Astin, 1984; Berger and Milem, 2000; Pascarella, 1985; Strauss and Volkwein, 2002; Weidman, 1989) support the fact that institutional type plays a significant role in influencing student outcomes. Applying this distinction to athletic spending provides future researchers the opportunity to connect institutional mission and resource allocation decision-making as it pertains to intercollegiate athletics.

With increased scrutiny, more attention is being paid to “big time” athletic programs and more pressure is being applied to win. Coaches’ contracts are full of incentives to win, and many coaches who do not produce victories are fired from their institutions. Some coaches with winning records may lose their jobs by failing to win against traditional rivals. Coaches and athletic administrators find themselves lured by institutions with stronger athletic reputations, and, in a continuous cycle, are put under pressure to improve those programs. Those who do not improve are often terminated or move on. Hoffman (2012) documented this trend with the increasing turnover of head coaches during the post-BCS period. Indeed, coaches with lengthy tenure at one institution are increasingly rare with top coaches moving from institution to institution in search of more prestige.

These dynamics contribute to a trend in intercollegiate athletics for immediate results as opposed to an emphasis on longer term traditions of excellence. This shift is in contrast to longstanding practices in higher education. Elite institutions are predicated upon generations of students educated by the best faculty, innovative

undergraduate education and networks of alumni. Institutions leverage hard-won reputations to attract highly qualified students, to motivate alumni to donate funds, and to recruit and develop the best and brightest faculty. The notion of a “Harvard Graduate” is not a recruiting strategy by a particular institution, but instead an ideal earned by a continuous commitment to maintaining a level of excellence over the long haul.

If organizational focus turns toward the immediate and short term, decisions can be made to jeopardizing an organization's reputation (Pusser & Doane, 2001). While not an exact replica, the efforts at Pennsylvania State University to conceal child abuse by an assistant football coach appeared to be the right decision in the short term, but ultimately inflicted radically severe and damaging blows to the reputation of the institution (Smith, 2016). This highly visible example of short term perspective illuminates the dangers and ripple effects on enrollment, donations, and an ability to recruit top talent and coaches.

The business world provides a contrast with examples of how short-term perspectives may be beneficial. If an organization “copies” other organizations, it can increase organizational survival (Scott, 2008). This is evident when student-athletes or coaches compare facilities among institutional competitors. Often, if an institution is found lacking in, for example, facilities, then the recruiting war may be “lost”. Bastedo and Bowman (2011) relay similar findings, discussing how identity image can influence decision-making. Athletics departments may compare themselves to others in the ir athletics conference or to aspirational peers and make decisions to improve facilities or programs in an effort to be seen “on par” with comparison institutions regardless of cost.

Finally, Dowling and Pfeiffer (1975) conclude that organizational legitimacy is realized by conforming to societal norms. There are often very public comparisons of stadium size or lavish facilities. Institutions may perceive the need to measure up because everyone else is doing it (Knight Commission, 2010). Despite these benefits to organizations, Brady et.al. (2016) question the ability to sustain such a short term approach. The authors speculate events, such as paying student-athletes, concussion lawsuits, or media revenue, may cause the athletics spending bubble to burst. The effect of any one of these events on spending trends could situate athletic programs, and institutions, in deeply troubled financial waters.

What do these organizational theories mean for the athletic spending “arms race?” If short term perspectives are adopted by athletic departments then spending may result in large amounts of debt putting the long term fiscal health of the institution at risk with associated declines in institutional bond ratings. Does the competition of the arms race extend across all institutional types? To answer this question, the typology used must be examined. Traditionally, higher education researchers compare institutions using Carnegie Classification categories. Carnegie Classification categories, first developed in 1970 by the Carnegie Commission on Higher Education, are updated regularly based on institutional data (Indiana University Center for Postsecondary Research, 2015). However, this study questioned if these categories were appropriate for issues related to athletics in higher education.

Ott and Lawrence (2013) addressed the possibility that traditional categorization of institutions into Carnegie Classification categories may not be appropriate institutional

comparisons for issues related to intercollegiate athletics in higher education. This study sought to empirically address this possibility.

The timing of an empirical investigation of these issues related to spending and peer institutions is particularly important. State sunshine laws create expectations of transparency. As the public comes to expect access to institutional records, including financial records, greater scrutiny is put on all aspects of the institution (McClendon and Hearn, 2006). Considering that athletic departments exist on the external layer of the organization (Scott, 2006), much of this attention is focused on how athletic departments function.

Secondly, institutions are being held more accountable by accrediting institutions (Higher Learning Commission, Middle States Commission on Higher Education, New England Association of Schools and Colleges, Commission on Institutions of Higher Education, Northwest Commission on Colleges and Universities, Southern Association of Colleges and Schools, Commission on Colleges, and WASC Senior College and University Commission (WSCUC)). This includes decision making to support the mission of the institution. With limited resources, institutions are often faced with the perception that spending on athletics is to the detriment of serving the core functions of the institution (Rabovsky, 2012).

Purpose of Research

The investigation of widely held perceptions of spending by intercollegiate athletics departments is the result of the perceived changes in perspective and practice of athletics departments. The established practice of using institutional characteristics to

study outcomes provided a framework for the current investigation. Using the aforementioned Carnegie Classification categories (Research, Doctoral, Masters and Baccalaureate, etc.) and selectivity (Gansemmer-Topf and Schuh, 2006; Kim, 2004; Strauss and Volkwein, 2002; Volkwein et.al. 2000, Titus, 2004, 2006;), this analysis examined the impact of institutional mission (for example, contrasting research universities to baccalaureate institutions) and, by proxy of selectivity, the academic profile of the institutions on fiscal indebtedness of athletics departments.

This study hypothesized that by taking into account these two broad institutional characteristics - classification and selectivity – differences among institutions in spending by athletics departments could be identified. Specifically, institutions emphasizing more academic rigor (more selective), may be less inclined to have total debt outstanding on athletic facilities. The proxy for academic rigor is a more selective admissions profile. Another specific hypothesis is that Research Universities may be more inclined to engage in more spending due to the increased attention to high visibility sports.

When studying financially related outcomes, it is important to recognize that not all institutions benefit from the same overall fiscal standing (institutional wealth). To level any disparities that may exist among the institutions in the study, a continuous covariate was included to reflect institutional wealth. A commonly used measure of institutional wealth is instructional spending per FTE. While this measure is not a variable of interest to the study, it is important to include to eliminate the possibility that differences in debt may be due to institutional resources.

Methods

This study utilized both the Knight Commission on Intercollegiate Athletics Athletic and Academic Spending Database for NCAA Division I (Knight Commission, 2015) and the Integrated Postsecondary Education Data System (U.S. Department of Education, 2015). The analysis was limited to all public FBS institutions available from the Knight Commission database. Variables obtained from the Knight Commission database included Instructional Expenditure per FTE and Total Debt Outstanding on Athletic Facilities. Variables obtained from IPEDS included Carnegie Classification (Basic) and percent of undergraduates admitted, reflecting the selectivity of the institution. The alternative classification scheme was provided to the author of this study by the developers (Ott and Lawrence, 2013). All variables were based on the 2011-2012 academic year for consistency. The three data sources were merged using SPSS and analyzed using a general linear model.

Results

From the merged completed dataset, the univariate and bivariate descriptive statistics are included in Table 1. There were 104 institutions in the dataset. Total debt has a large range (including 13 institutions reporting zero debt) and several highly selective institutions (including two institutions accepting 10% or less of undergraduate applicants). These patterns are also illustrated in the boxplots depicting a more effective snapshot of the frequency of the extreme values (Figure 2).

Table 1. Descriptive Statistics for Continuous Variables

	N	Minimum	Maximum	Mean	Std. Deviation
Total Debt Outstanding on Athletic Facilities	103	0	428,268,000	66,523,133	72,526,661
Instructional Spending per FTE Student	104	4,382	37,796	10,839	5,238
Selectivity	103	9	100	65	18
Valid N (listwise)	102				

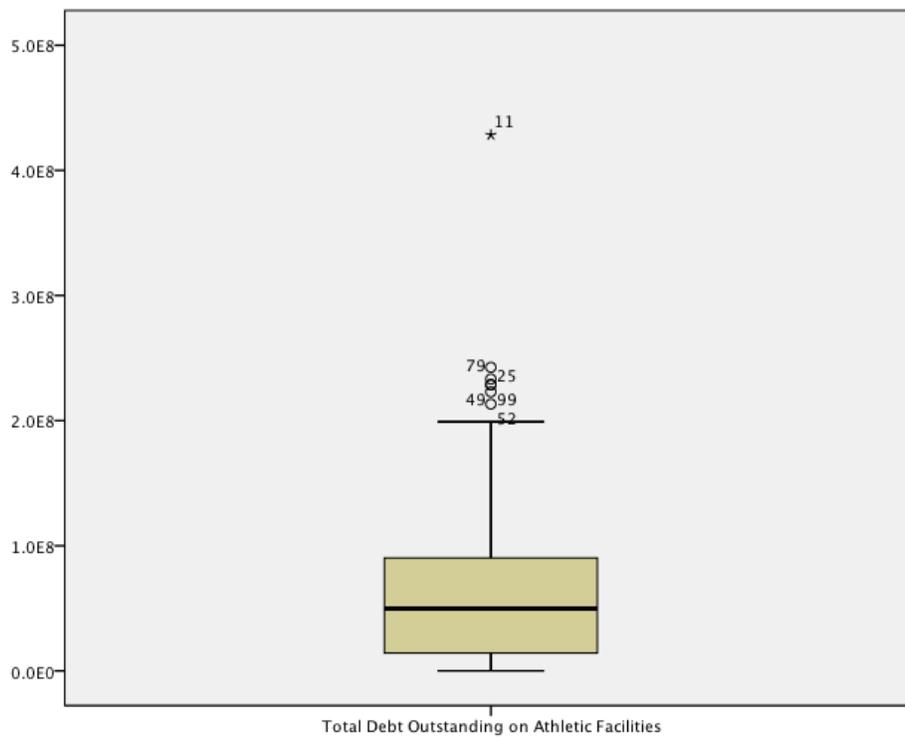


Figure 2. Boxplot of total debt outstanding with one potential extreme value

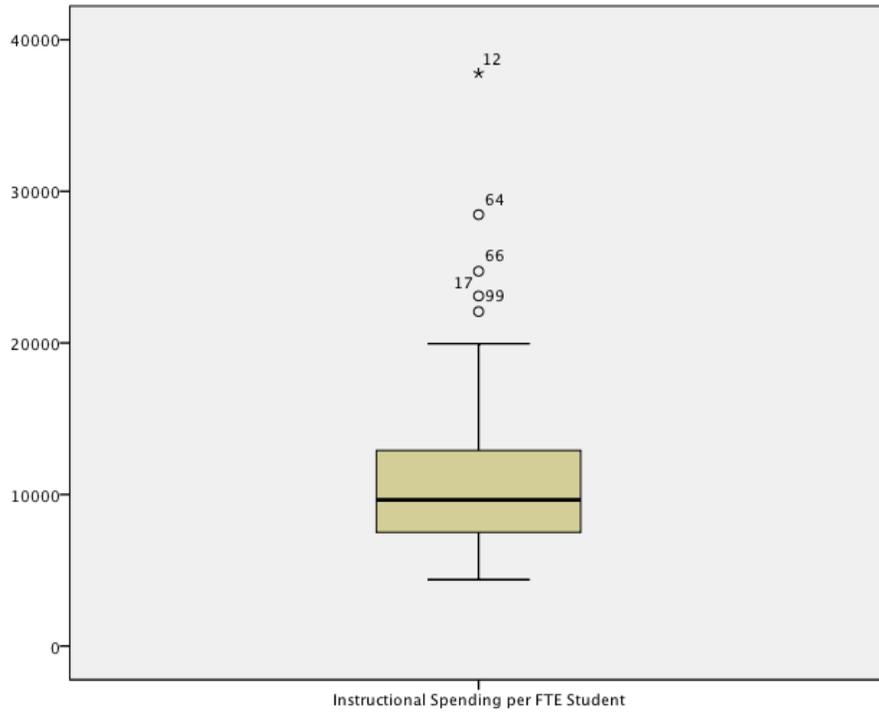


Figure 3. Boxplot of instructional spending per FTE student with a slightly right skewed distribution

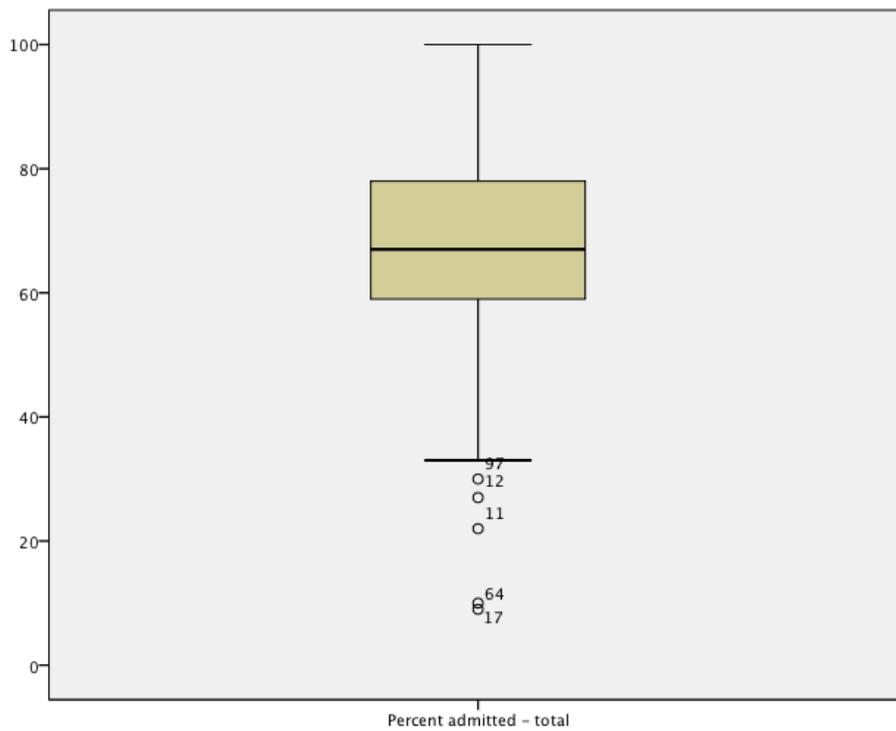


Figure 4. Boxplots for selectivity fairly normally distributed

Because institutions in the dataset were limited to FBS schools, it was not surprising to find that most institutions were research universities (Table 2).

Table 2. Descriptive Statistics for Carnegie Classification

	Frequency	Percent
Baccalaureate Colleges	2	1.9
Doctoral/Research Universities	3	2.9
Master's Colleges and Universities (larger programs)	10	9.6
Research Universities (high research activity)	34	32.7
Research Universities (very high research activity)	55	52.9
Total	104	100.0

The distributions of institutions using the alternative classification reflects a slightly improved frequency distribution across the categories. Most institutions are included in the “tier 2” categories, indicating more institutions were placed into categories with relatively lower academic performance (Table 3).

An alternative variable considered was NCAA athletic conference. However, the overlap between NCAA athletic conference and the Carnegie Classification and Alternative Classification resulted in redundancy counterproductive to the analysis. Therefore, this variable was not used.

The next step describing the data was to examine the total debt outstanding. Bivariate comparisons allow the visual inspection of the relationship between debt outstanding and the classification schemes and selectivity. The first relationship

Table 3. Alternative Classification

	Frequency	Percent	Valid Percent	Cumulative Percent
Extensive 1	5	4.8	4.8	4.8
Intensive 1	8	7.7	7.7	12.5
Extensive 2	33	31.7	31.7	44.2
Intensive 2	58	55.8	55.8	100.0
Total	104	100.0	100.0	

summarized the mean total debt outstanding for each of the Carnegie Classification categories (Table 4). Research universities with very high research had the highest mean total debt outstanding, and from a visual inspection looked very different from the rest of the categories. Because there was only one baccalaureate institution with zero debt, there was no standard deviation for this category.

Table 4. Total Debt Outstanding on Athletic Facilities by Carnegie Classification

Carnegie Classification 2010: Basic	Mean	N	Std. Deviation
Baccalaureate Colleges--Arts & Sciences	.00	1	.
Doctoral/Research Universities	31,167,388	3	17,156,086
Master's Colleges and Universities (larger programs)	37,057,344	10	31,722,988
Research Universities (high research activity)	35,660,331	34	43,172,241
Research Universities (very high research activity)	94,097,379	55	83,257,463
Total	66,523,133	103	72,526,661

This pattern was again evidenced in the alternative classification; extensive 2 institutions appeared to be operating at higher debt levels, whereas both tier 1 types had similar debt levels. Intensive 2 institutions appear to be the lowest (Table 5). These patterns were again depicted in the box plots, allowing the graphical interpretation of these means.

Table 5. Total Debt Outstanding on Athletic Facilities by Alternative Classification

Alt Classification	Mean	N	Std. Deviation
Extensive 1	61,124,815	5	31,829,072
Intensive 1	61,363,848	7	56,246,877
Extensive 2	125,908,949	33	91,046,793
Intensive 2	33,822,696	58	34,918,421
Total	66,523,133	103	72,526,661

The final descriptive procedure examined the continuous variables in the model using correlations. Correlations test for significant relationships between pairs of continuous variables, in this case debt and selectivity and debt and institutional wealth (as measured by instructional spending). A significant negative relationship between total debt outstanding and selectivity ($-.297, p < .01$) is displayed in Table 6. From these correlations, it may be that more selective institutions were incurring less debt. The correlation table also substantiates the inclusion of instructional spending per FTE as an important covariate due to the significant positive correlation with debt ($.345, p < .01$).

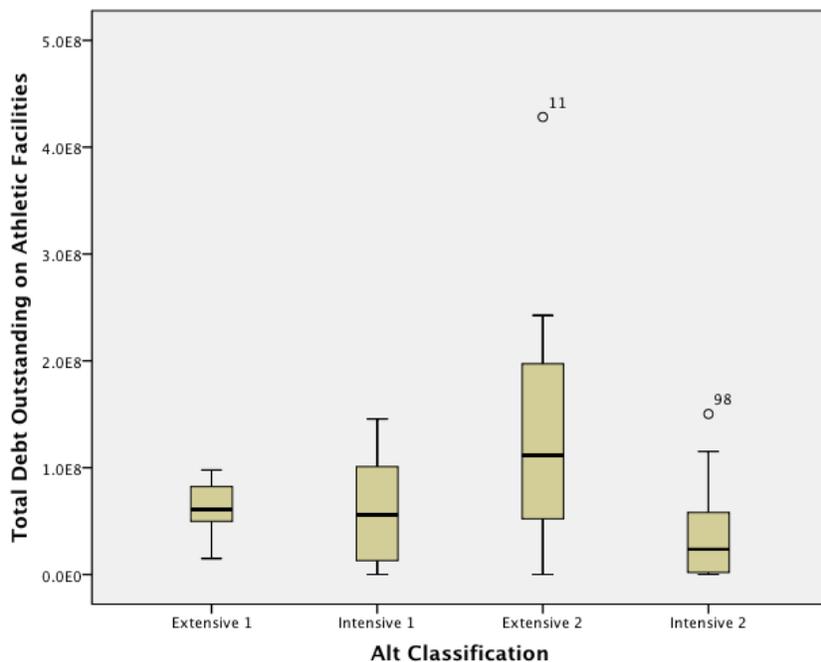


Figure 5. Boxplot of total debt outstanding by the alternative classification categories, potential outlier institutions for the extensive 2 and intensive 2 categories

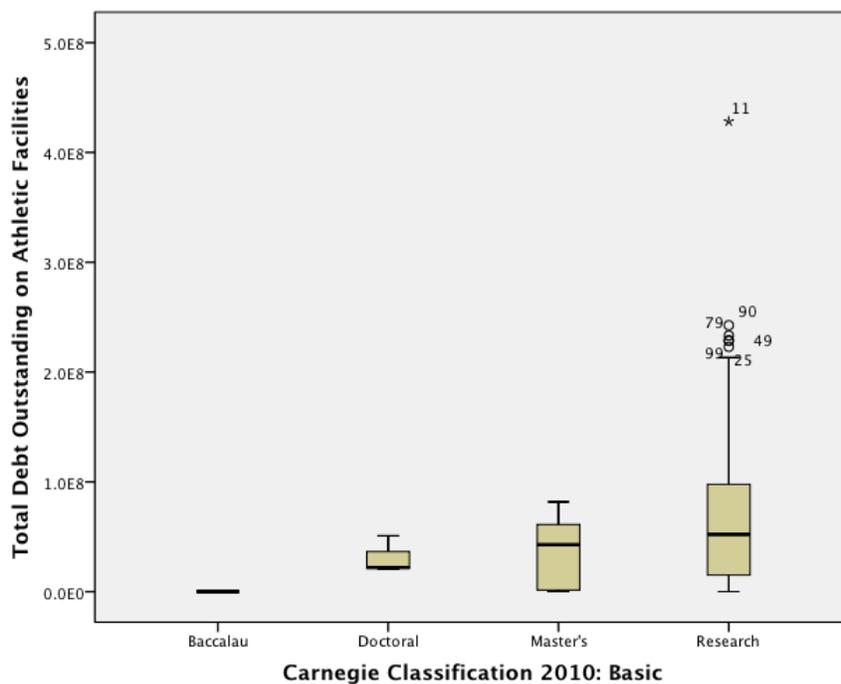


Figure 6. Boxplots of total debt outstanding by Carnegie Classification categories with extreme values for the research institutions noted

Table 6. Correlation of Total Debt and Continuous Predictors

		Total Debt Outstanding on Athletic Facilities	Selectivity	Instructional Spending per FTE Student
Total Debt Outstanding on Athletic Facilities	Pearson Correlation	1	-.297**	.345**
	Sig. (2-tailed)		.002	.000
	N	103	102	103
Selectivity	Pearson Correlation	-.297**	1	-.483**
	Sig. (2-tailed)	.002		.000
	N	102	103	103
Instructional Spending per FTE Student	Pearson Correlation	.345**	-.483**	1
	Sig. (2-tailed)	.000	.000	
	N	103	103	104

** . Correlation is significant at the 0.01 level (2-tailed).

Inferential Analysis

The inferential analysis for this study was a general linear model with the continuous response variable, total debt outstanding. The predictor variables were the Carnegie Classification (categorical) and selectivity (as a reminder, this was a continuous variable measured by the percent of undergraduate applicants admitted). An important covariate in the model was instructional spending per FTE, which accounted for instruction to institution variability due to differences in wealth.

The specific model was: *Total Debt Outstanding = Carnegie Classification + Selectivity + Instructional Spending per FTE*

It is important to comment on the zero values for the baccalaureate institutions in the dataset. This category was retained in the model for comparative purposes as the same institutions were included in the alternative classification scheme. The Carnegie Classification model was run with and without this category, with no difference in the results.

Running the model resulted in a severe violation of homoscedasticity of the residuals, evidenced by the fanning pattern of the residuals versus predicted value in Figure 7. To remediate this violation, a Box-Cox transformation was run on the response variable.

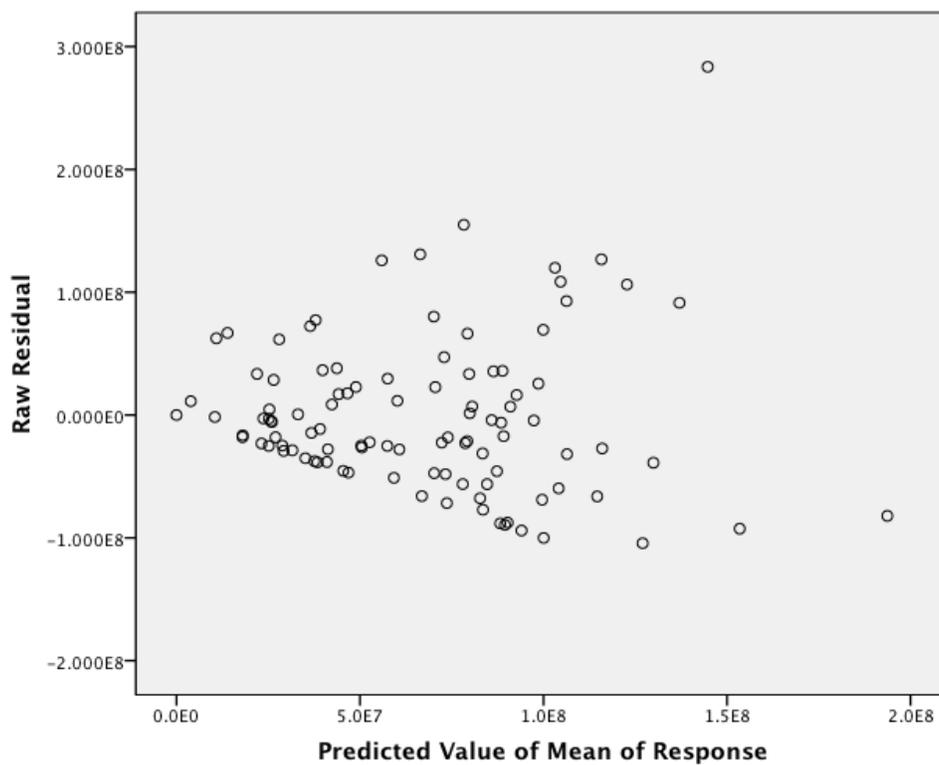


Figure 7. Plot of homoscedasticity of residuals vs. the predicted values for original data

In addition to the violation of homoscedasticity, the residuals failed to meet the test for normality. This violation persisted despite transforming the response variable and transforming both of the continuous predictor variables and centering of the continuous predictor variables. Due to this lack of normality, a more conservative p value was used throughout the analyses as non-normality impacts the standard error of the estimates (Burnham and Anderson, 2009).

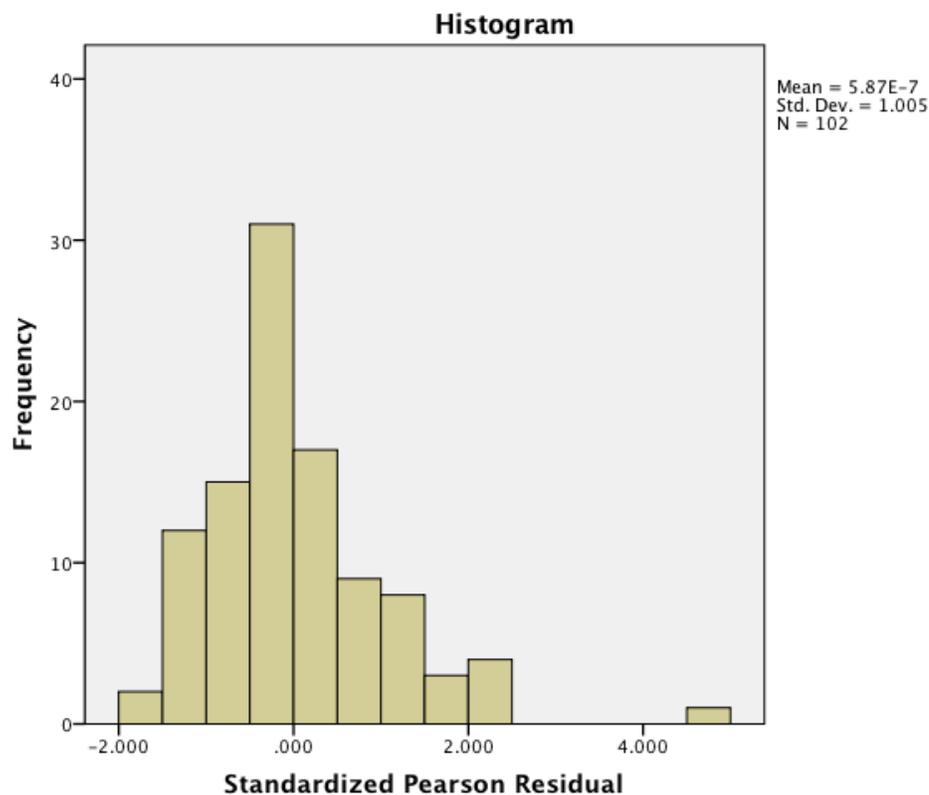


Figure 8. Histogram of the residuals for the transformed response model including the one extreme residual value.

The model was re-run with the transformed response variable. An examination of the standardized residuals in Figure 8 revealed one institution with a residual greater than 4.00. All subsequent analyses were run with and without this institution. While the

overall model fit improved without the extreme institution, the presence of this institution did not alter the significance of the results so this institution was retained in the analysis.

Interpretation of the Model

Using a p value of .01, Carnegie Classification was a significant predictor of the transformed variable of total debt outstanding. Selectivity was not a significant predictor in this model. Instructional spending per FTE was included only as a covariate in the model and was not interpreted further. Table 7 contains the test statistic values and significance levels for each of the independent variables.

Table 7. General Linear Model Significance for Carnegie Classification

Tests of Model Effects			
Source	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	31.659	1	.000
Carnegie Classification	28.290	4	.000
Selectivity	1.176	1	.278
Instructional Spending Per FTE (centered)	.935	1	.334

For each Carnegie Classification, the transformed mean total debt outstanding was presented in Table 8. Viewed in conjunction with Table 9, the significant differences ($p < .01$) between Carnegie categories. Baccalaureate institutions are significantly lower than all other types. However given the issues with this category raised earlier, this result was not interpreted further. Perhaps more surprisingly, the only other significant difference occurs between the two types of research universities (high versus very high research activity), with the very high carrying a significant larger

amount of debt. (NOTE: the numbers represented in the tables are the transformed means, not actual dollar values).

Table 8. Mean Total Debt Outstanding by Carnegie Classification Category

Carnegie Classification	Transformed Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
Baccalaureate Colleges--Arts & Sciences	-10	11	-31	12
Doctoral/Research Universities	34	8	19	49
Master's Colleges and Universities	30	4	21	39
Research Universities (high research activity)	28	2	23	33
Research Universities (very high research activity)	37	2	33	40

Table 9. Pairwise Comparisons for Carnegie Classification

		Mean Difference	Std. Error	df	Sig.	95% Wald Confidence Interval for Difference	
						Lower	Upper
Baccalaureate Colleges	Doctoral/Research Universities	-43 ^a	14	1	.002	-70	-17
	Master's Colleges and Universities	-40 ^a	13	1	.002	-64	-15
	Research Universities (high research)	-37 ^a	12	1	.001	-60	-14
	Research Universities (very high research)	-46 ^a	11	1	.000	-68	-25
Doctoral/Research Universities	Baccalaureate Colleges	43 ^a	14	1	.002	17	70
	Master's Colleges and Universities	4	9	1	.675	-14	21
	Research Universities (high research)	6	8	1	.469	-10	22
	Research Universities (very high research)	-3	8	1	.708	-19	13
Master's Colleges and Universities (larger programs)	Baccalaureate Colleges	40 ^a	13	1	.002	15	64
	Doctoral/Research Universities	-4	9	1	.675	-21	14
	Research Universities (high research)	2	5	1	.661	-7	12
	Research Universities (very high research)	-7	5	1	.188	-17	3
Research Universities (high research)	Baccalaureate Colleges	37 ^a	12	1	.001	14	60
	Doctoral/Research Universities	-6	8	1	.469	-22	10
	Master's Colleges and Universities	-2	5	1	.661	-12	7
	Research Universities (very high research)	-9 ^a	3	1	.007	-15	-2
Research Universities (very high research)	Baccalaureate Colleges	46 ^a	11	1	.000	25	68
	Doctoral/Research Universities	3	8	1	.708	-13	19
	Master's Colleges and Universities	7	5	1	.188	-3	17
	Research Universities (high research)	9 ^a	3	1	.007	2	15

The second phase of the inferential analysis substituted the Alternative Classification system developed by Ott and Lawrence in place of the Carnegie Classification. As all other variables are the same, the Box-Cox transformation was still appropriate for this model. The overall results were similar to that of the model using Carnegie Classification, as the Alternative Classification variable was statistically significant ($p < .01$).

Table 10. General Linear Model Significance for Alternative Classification

Source	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	37.571	1	.000
Alternative Classification	28.504	3	.000
Selectivity	.004	1	.947
Instructional Spending per FTE (Centered)	.667	1	.414

For each Alternative Classification category, the transformed mean total debt outstanding is presented in Table 11. Viewed in conjunction with Table 12, the significant differences between categories were evident by significance values less than 0.01 . Two specific significant differences are included in Table 11. Extensive level 2 institutions had significantly higher debt than from intensive level 2 institutions and extensive level 2 had significantly higher debt than intensive level 1 institutions. (NOTE: the numbers represented in the tables are the transformed means, not actual dollar values).

Table 11. Mean Total Debt Outstanding by Alternative Classification

Alternative Classification	Transformed Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
Extensive Level 1	39	6	26	51
Intensive Level 1	29	4	19	38
Extensive Level 2	42	2	38	47
Intensive Level 2	26	1	22	29

Table 12. Pairwise Comparisons for Alternative Classification

		Mean Difference	Std. Error	df	Sig.	95% Wald Confidence Interval for Difference	
						Lower	Upper
Extensive 1	Intensive 1	9	7	1	.193	-5	24
	Extensive 2	-3	6	1	.575	-16	9
	Intensive 2	13	6	1	.048	.09	26
Intensive 1	Extensive 1	-9	7	1	.193	-24	5
	Extensive 2	-13	5	1	.010	-23	-3
	Intensive 2	3	5	1	.557	-7	13
Extensive 2	Extensive 1	3	6	1	.575	-9	16
	Intensive 1	13	5	1	.010	3	23
	Intensive 2	16	3	1	.000	10	23
Intensive 2	Extensive 1	-13	6	1	.048	-26	-.09
	Intensive 1	-3	5	1	.557	-13	7
	Extensive 2	-16	3	1	.000	-23	-10

Results

The primary purpose of this research investigated the perception that the “arms race” of spending in athletics occurs across all institutions to the potential detriment of the long term health of the institution. Reflected by total debt outstanding on athletic

facilities for a dataset of public FBS institutions, it is apparent that not all institutions accrue debt at the same rates. Specifically, Carnegie Classification Research Universities with very high research incur significantly greater debt than Research Universities with high research activity. The mean values (Table 4) were \$94,097,379 for very high research activity and \$35,660,331 for high research activity. These results confirm the hypothesis that institutional mission can distinguish differences in fiscal practices of athletic departments.

While this analysis does not have the ability to provide causal explanation for the differences, overall institutional wealth is not a contributor to the difference, as it is controlled for in the model. Other possible explanations could be attributed to flagship status, conference affiliation, or change in conference affiliation. Another possible explanation could be that these institutions are “leading the way” and the research institutions with high research activity may follow in subsequent years. All of these explanations would need to be empirically investigated in future research.

While the differences in institutional type are illuminating using the Carnegie categories, the fact that differences also exist using the alternative classification model are of equal interest. In this analysis the alternative classification categories allow further refinement among institutional types as there are two significant differences in the results. The significant differences among extensive 2 institutions and both intensive institutions (extensive 2 institutions mean debt outstanding of \$125,908,949, versus \$56,246,877 for intensive 1 and \$33,822,696 for intensive 2) provide more information about the levels of debt incurred among the institutions within the varying athletic functions. The extensive 2 institutions (larger athletic programs with lower

student academic achievement) are incurring the greatest amount of debt, whereas the both the intensive categories incur less. The absence of the “baccalaureate” category provides a much more meaningful grouping of institutions when examining this important factor of spending.

Interestingly, one of the major differences in defining institutions using the alternative classification analysis is the emphasis on the size of the athletic program, not the academic profile of the institution. This reinforces the non-significant result of the selectivity variable. Total debt may be a product of the scope of the athletic program, not necessarily institutional characteristics. Although speculative, the methodology for the alternative classification included athletic characteristics of institutions as opposed to the Carnegie system which does not include athletic characteristics, which may explain the increased utility of the alternative classification as a comparison tool.

A second purpose of this study compared the effectiveness of the two classification models to discern athletic characteristics among institutions. In order to compare the models, several different statistical measures were used. The most straight-forward statistical comparison between models was the amount of variability accounted for by the model. In both cases, the adjusted R^2 values were about the same, (.180 for the Carnegie Model and .189 for the Alternative Classification). Second, pertaining to model fit, both models fit the data approximately the same (AIC for the Carnegie Model is 849.308 and for the Alternative Model the AIC is 847.284). Another indication of similarity is the non-significance of selectivity in both models.

Despite statistical equivalence of the two classification methods, the practical value of allowing institutions to benchmark athletic related variables using a scheme

derived from athletic indicators provides an opportunity to explore alternative ways to research these ever evolving practices in higher education. However, this is speculative and awaits further empirical study.

The statistical difference between the baccalaureate and all other Carnegie classification categories was attributed to a lack of institutions in the category. However, the difference between the two categories of research institutions was surprising. Using the alternative classification scheme, the differences between the two categories of extensive was not significant which differed from the Carnegie classifications conclusions. Investigating the two groupings of these larger institutions is a subject for further study.

Limitations

This study was limited to the public FBS institutions contained in the Knight Commission Dataset. The results may or may not be generalized to other institutions or institutional types. In addition, there are many more variables that can be used, however, this study limited the scope to two frequently used organizational variables.

An additional limitation to the study is the unbalanced design. The use of a general linear model with type III sums of squares accounted for the unbalanced design, statistically correcting for this limitation. Related to the unbalanced design is a general lack of institutions in the baccalaureate category, providing limited variability for this type, in direct contrast to the larger variability (shown in the boxplot in Figure 6) for the other categories. These limitations were dealt with appropriately from a statistical standpoint and are inherent in the composition of the population of institutions. The use

of the alternative classification categories provides a more equal distribution of institutions across categories, which provides more variability within each category for the analysis.

Further research may incorporate more in-depth institutional history and knowledge, not available in the databases used for the analysis. Qualitative inquiry could be used to illuminate the reason and purpose for incurring debt, which would shed light on some of the causal reasons behind the spending practices by these institutions.

Conclusion

In the current climate of accountability in higher education, with much attention being given to the costs families and students pay, the expenditures of institutions, particularly public institutions are under increased scrutiny. Despite the reality that most athletic departments operate as auxiliary budget areas, debt incurred by any part of the organization is factored into the overall fiscal health of the institution. The results of this study support the notion that not all institutional types are engaging in an arms race at equal levels. While the alternative classification model was able to provide more delineation among categories, differences exist among institutional types using either classification scheme. The traditional Carnegie categories, identified research institutions with very high research carrying more debt than research institutions with relatively lower research activities. Using the alternative classification model it appears it is not the research function of institutions, but perhaps the size of the athletic program fueling these differences. This important finding may illuminate future work in comparing athletic related metrics among institutions. The current accepted practice of

using Carnegie categories to compare athletic related variables merits further investigation.

This paper establishes evidence that the arms race of spending is not equal across all institutional types. More effort needs to be spent on differentiating institutions when drawing conclusions regarding fiscal accountability. The second purpose of the paper, to compare classification schemes, also established evidence that using a classification scheme based on athletic related metrics has the potential to provide more differentiation among athletic related variables. Both of these contributions have the potential to provide a better understanding of the fiscal health of athletics in higher education.

References

- Astin, A.W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 24(5), 207-308.
- Brady, E., Berkowitz, S., & Upton, J. (2016). Can college athletics continue to spend like this? USA Today. Retrieved from <http://www.usatoday.com/story/sports/college/2016/04/17/ncaa-football-basketball-power-five-revenue-expenses/83035862/>
- Benford, R.D. (2007). The college sports reform movement: Reframing the "Edutainment" industry. *The Sociological Quarterly*, 48(1), 1-28.
- Berger, J.B. and Milem, J.F. (2000). Organizational behavior in higher education and student outcomes. In J. C. Smart (ed.), *Higher education handbook of theory and research*, 15, 268-338. New York: Agathon Press.
- Burnham, K.P. & , D.R. (2009). *Model selection and multimodel inference: A practical information-theoretic approach*. Springer New York.
- Earl, J.W. (2004). The faculty role in reforming college sports. *Academe*, 90(5), 53-57.
- Gerdy, J.R. (2002). Educational defeats. *Academe*, 88(1), 32-36.
- Hoffman, J. L. (2012). Competition and control in the gridiron marketplace: Findings from the intercollegiate athletics leadership database.
- Indiana University Center for Postsecondary Research (2015). The Carnegie Classification of Institutions of Higher Education, Bloomington, IN: Author.
- Knight Commission on Intercollegiate Athletics. (2015). *Athletic & Academic Spending Database for NCAA Division I*. Knight Commission on Intercollegiate Athletics. www.knightcommission.org. Athletics Data Source: USA TODAY's NCAA Athletics Finance Database.
- Knight Commission on Intercollegiate Athletics. (2010, June). *Restoring the balance: Dollars, values, and the future of college sports*. Miami, FL: John S. and James L. Knight Foundation.
- McClendon, M.K. and Hearn, J.C. (2006). Mandated openness in public higher education: A field study of state sunshine laws and institutional governance. *The Journal of Higher Education*, 77(4), 645-683.
- Ott, M. and Lawrence, J. (2013). Rethinking institutional comparisons in intercollegiate athletics scholarship. Paper presented at the Annual Meeting of the American

Educational Research Association, San Francisco, CA.

Pascarella, E.T. (1985). College environmental influences on learning and cognitive development: A critical review and synthesis. In J. Smart (ed.), *Higher education: Handbook of theory and research*, 1, 1-61. New York: Agathon.

Rabovsky, T.M. (2012). Accountability in higher education: Exploring impacts on state budgets and institutional spending patterns. *Journal of Public Administration Research and Theory: J-PART*, 22(4), 675-700.

Scott, W. R., & Davis, G.F. (2006). *Organizations and organizing: Rational natural and open system perspectives* (6th ed.). New Jersey: Prentice Hall.

Smith, A. R. (2016). *Wounded lions: Joe Paterno, Jerry Sandusky, and the crises in Penn State athletics*. University of Illinois Press.

State Higher Education Executive Officers Association (2016). State higher education finance: FY 2015. Retrieved from files/SHEEO_FY15_Report_051816.pdf

Strauss, L.C. and Volkwein, J.F. (2002). Comparing student performance and growth in 2- and 4-year institutions. *Research in Higher Education*, 43(2), 133-161.

U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Weidman, J. (1989). Undergraduate socialization: a conceptual approach. In J. Smart (ed.), *Higher Education: Handbook of theory and research*, 5, 289-322. New York: Agathon Press.