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An Empirical Examination of University Intercollegiate Athletic Expenditures

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Abstract

To date, little empirical work has examined the institutional returns associated with athletic program investments. While intangible brand effects are commonly cited, such as athletics serving as the perceptual “front porch” of the institution, direct examination of the effects of athletic programs has often been narrow in scope. Within this study, we assess the contributions of investment in athletics as compared to other areas of institutional investment, on important institutional outcomes. Data for the study was collected from two datasets, the Integrated Postsecondary Education Data System (IPEDS) and the Equity in Athletics dataset. Fixed effects models for NCAA Football Bowl Subdivision schools were constructed to assess the return on investment relative to total institutional revenues, gift revenues, student application rates, and student graduation rates. Findings reveal that for every dollar of athletic expenditure per FTE \$2.12 of core revenues per FTE, \$.24 in gift revenues per FTE, and a .165% increase in graduation rates were produced.

Introduction

Institutions that nurture and leverage resources in ways that create superior levels of customer value are more likely to develop advantage relative to their competitors (Drucker, 1954). It is through the allocation of resources, and the utilization and communication of these resources, that institutions create and signal strong and differentiated positions and higher levels of customer value (Hunt, 1997; Kirmani & Rao, 2000). This signaling serves to reinforce institutional and sub-brand positions and set customer expectations, thus rewarding institutions with superior performance outcomes (Aaker, 2004).

The University of Washington recently announced plans for a \$250 million renovation to their football stadium (Long, 2010). The announcement came at the same time state support for the University was declining, tuition was increasing at double digit rates, and academic programs were being cut or pared back (Long, 2011). National Collegiate Athletic Association (NCAA) reports on athletic expenditures indicate that

the University of Washington is not alone in its commitment to investing in its intercollegiate athletic programs (Fulks, 2010).

University expenditures in athletics often come under fire by critics who contend that resources directed to university athletic programs should instead be invested in the academic core (e.g., Sperber 1990, 2000). Such was exemplified in March of 2011, when activist Ralph Nader called for colleges and universities to end college athletic scholarships, asserting that the conveyance of athletic scholarships make student-athletes professional athletes, for whom education is, at best, of secondary consideration. Nader’s comments led to the following NCAA response:

Mr. Nader’s proposal is off-base on so many fronts it is hard to know where to start. The 145,000 student-athletes who receive athletics related financial aid each year are in fact students first—as evidenced by the fact that in almost every demographic they graduate at higher percentages than their counterparts in the general student body. Moreover, less than two percent of them will ever

play professional sports. The assertion that student-athletes who receive athletics aid are professionals defies logic—they are students, just like any other student on campus who receives a merit-based scholarship. (Williams, 2011)

At its core, the disagreement over where to invest institutional resources (athletics vs. academic core) is a disagreement over the market and branding strategies pursued by the institution (e.g., Aaker, 2011). Conversations concerning the role and impact of athletics within higher education have been and continue to be interesting, important, and heated—yet to date, very little empirical research on this topic has been performed. Specifically, there is a dearth of solid, generalizable, empirical work that has examined institutional returns associated with university investments in athletic programs. While the intangible and psychological branding benefits associated with athletics are increasingly cited, such as athletics serving as the “front porch” of the institution (e.g., Toma & Kramer, 2010), direct examination of the effects of athletic programs has often been narrow in scope. Such examination is necessary to evaluate the strategic market and branding investments of these institutional resources. The current study seeks to directly assess the relative contributions of institutional investment in athletics in concert with other important areas of core investment, on critical institutional outcomes.

Literature Review

The marketing literature contains a multitude of studies that have attempted to gauge the contributions of intercollegiate athletics programs to host colleges and universities (e.g., Frank, 2004; Goff, 2000; Litan, Orszag, & Orszag, 2005; Stinson & Howard, 2007, 2008, 2010). Unfortunately, the studies that have been performed are often inconsistent and divergent in their conclusions; many rely on simple case study designs that are not generalizable, while others fail to account for important inter-institutional factors that may account for different results at different schools. What is clear is that universities are increasingly investing in athletic programs at the highest levels of competition (Fulks, 2010).

Branding research supports that within service and service-dominant contexts (such as is exemplified by the higher education context), multiple factors comprise the institutional brand, and that these brands need to be treated differently than do traditional consumer packaged goods brands (Riley & de Chernatony, 2000; Marquardt, Golicic, & Davis, 2011). Of particular and emphatic note is the central role that people

and experiences have at the core of service brand (Davis, Golicic, & Marquardt, 2008).

In his seminal service branding manuscript, Berry (2000) identified four strategies by which service institutions cultivate brand equity. First, service institutions need to make “a conscious effort to be different, a conscious effort to carve out a distinct brand personality” and a conscious effort to “forge new paths to reach and please customers” (p. 131). Second, service institutions need to stand “for something that is important to targeted customers” (p. 132). Third, “Great brands always make an emotional connection with the intended audience” (p. 134). Lastly, service institutions should focus on, “involving [internal stakeholders] in the care and nurturing of the brand” (p. 135).

Despite an improved understanding of how to build brands possessing a pronounced service component, and an increased emphasis on investing in athletics, only 14 NCAA member schools reported “self-supporting” athletic departments in 2009. In other words, only 14 member schools produced enough revenue to offset their athletic program expenditures (Gillum, 2010). At the non-self-supporting schools, escalating costs and competitive pressures resulted in over \$1.8 billion in subsidies from universities’ general funds and student fees to support intercollegiate athletic programs (Upton, Gillum, & Berkowitz, 2010). This level of expenditure necessitates a thorough evaluation of the returns on investment generated by these programs. Within this study, we utilize two existing panel datasets to explore the returns on athletic investment at NCAA Football Bowl Division (FBS, formally NCAA I-A) institutions.

Financial Returns of Athletic Investment

Typically, return on investment (ROI) is empirically grounded, and most often reflected in the form of financial metrics. Perhaps surprisingly, and in spite of the numerous papers that have discussed the connections of intercollegiate athletics and institutions of higher education, the overall return on athletic investment has not been widely researched. In the only study that we are aware of that globally explores the financial effects of intercollegiate athletic programs, research commissioned by the NCAA concluded that for every one dollar invested in athletic programs, approximately one dollar of revenue was produced (Litan, Orszag, & Orszag, 2005). While this study did not uncover a negative effect associated with university investments in athletics, it also did not demonstrate a significant positive return. Further, the study failed to incorporate the opportunity costs of investing in athletics rather than other university program areas. Suggs (2009) notes that opportunity costs, at least in part, account

for the difficulty in measuring the return on athletic investment. Still, to the best of our knowledge, the NCAA study remains the only panel study to globally examine the return on athletic investment.

In a less generalizable context, Goff (2000) used two case studies to estimate an adjustment to the reported revenues associated with intercollegiate athletics. He concluded that many more programs are profitable than has historically been reported when adjustments are made for tuition revenues associated with student-athletes and additional enrollment (of both student-athletes, and non-athletes who matriculate due to the institution's athletic program). However, he also noted that many athletic departments quickly use any net profit by increasing intra-department expenses; consequently, athletic program profits do not necessarily directly benefit other areas of the institution.

Historically, one reason for the lack of empirical analyses investigating the relationship between athletic programs and institutions of higher education has been the lack of holistic panel data. While the NCAA regularly provides reports on the athletic-related revenues and expenditures of its member schools (e.g., Fulks, 2010), these reports are limited to athletic department financial performance, and thus are not useful in understanding intercollegiate athletics' broader strategic contributions to universities. Additionally, as was previously mentioned, these reports lack any consideration as to the opportunity costs associated with athletic expenditures. From a market investment standpoint, this makes assessing the value of intercollegiate athletic programs difficult.

One area in which more traction has been gained is institutional giving. Within this context, a substantial line of research has developed that focuses on the relationship between intercollegiate athletic programs and fundraising. While private donations represent only one form of revenue to the institution, the ability of athletic programs to attract and influence donors has allowed a more careful examination of the returns associated with athletic investment. However, even within this more developed research stream results are inconsistent. Several studies have concluded that there is little or no relationship between university athletics (usually measured in terms of on-the-field success) and institutional giving (e.g., Gaksi & Etzel, 1984; Shulman & Bowen, 2004); while other studies have indicated that there is a significant, positive effect of athletics on giving (e.g., McCormick & Tinsley, 1990; Daughtrey & Stotlar, 2000; McEvoy, 2005). Frank (2004) summed up this line of research as "mixed," and concluded that, at best, the disparate result patterns suggested a small effect of university athletics on giving. A recent meta-analysis of 30 years of research in

this area posited a slightly more positive relationship, concluding that athletic programs have a small, but significant effect on donors (Martinez, Stinson, Kang, & Jubenville, 2010).

While most of the studies connecting intercollegiate athletics and fundraising have focused on athletic program giving, a couple of studies have examined institutional giving (athletic and academic combined) as the relevant dependent variable. In both the Rhoads and Gerking (2000) and the Cunningham and Conchifiano (2002) studies, the authors found that intercollegiate athletics provided a small, positive influence on giving, but that measures of academic quality had a stronger effect. In two separate and interesting extensions of these works, Stinson and Howard (2007; 2008) found opposite giving effects for NCAA FBS and FCS (formally Division I-AA) schools. In their 2007 study, Stinson and Howard found a donor preference for giving to athletic programs versus academic programs across NCAA FBS schools, with the strongest effects occurring at schools with lower academic rankings. They then found the opposite pattern in their 2008 study of NCAA FCS schools, where increases in athletic support coincided with increases in academic program support. In both cases, however, athletics programs were shown to attract new donors to the institution, serving important marketing and branding functions. New athletic donors that can also be cultivated to make academic gifts turn out to be the most valuable donors to the institution, as they make larger gifts and are retained at higher rates than are their counterparts (Stinson & Howard, 2010). In this sense, athletics programs have the potential to make tremendous contributions to broader institutional branding and fundraising efforts.

Non-Financial Returns on Athletic Investment

Universities also have mission-based, non-financial metrics against which athletic investments can be assessed. The allocation of resources in pursuit of these mission-based and non-fiscal objectives is also relevant to marketing and branding strategy decisions. Athletic programs have been anecdotally, and to a much lesser degree, empirically linked to application rates for some time. In the first significant review of the relationship, Toma and Cross (1998) tracked the application rates for NCAA football and basketball champions. Of the 16 subject schools that won or shared a college football championship, 14 had an increase in applications the year after the championship. Two of those schools increased applications over 20%, and seven increased applications by over 10%. Over the three-year period following the championship, all 14 maintained application rate increases of at least 7%. Basketball champi-

onships produced a similar result. Over the timeframe of the study, 13 different schools won the NCAA Division I basketball title. In the year following the championship, 10 of the 13 schools saw increases in applications, with two schools demonstrating application increases of more than 10%. Over the three-year period following the championship, all 10 of the schools sustained their increased application levels. Other studies have also supported a positive effect of athletic success on applications and enrollment (e.g., Borland, Goff, & Pulsinelli, 1992; Mixon & Hsing, 1994). Interestingly, and perhaps not surprisingly, in a case study setting, a lack of intercollegiate sport success has been linked to a decline in applications (Goff, 2000). Still, each of these studies operationalizes the athletic contribution as on-the-field athletic performance measures (i.e., wins/ losses, post-season appearances), thereby limiting the extendibility of the findings.

From a managerial standpoint, the more controllable decision for the institution is the investment in athletics decision. While no study, to our knowledge, has directly examined the influence of institutional athletic investments, Goff (2000) did approach the examination of athletic influence on applications from a more strategic standpoint. He studied three schools, Wichita State University, the University of Texas at Arlington, and Georgia State University. Both Wichita State and UT-Arlington made the strategic decision to drop football, allowing those resources to be re-allocated to other areas of the institution. Georgia State, in contrast, decided to add a football program at the NCAA FCS level (formerly NCAA I-AA). With the elimination of the football programs at Wichita State and UT at Arlington, regression models indicated a loss of approximately 550 students at each of the schools, while estimates indicated an increase in 500 students at Georgia State as a result of adding football. Goff's study provides support for the contention that institutional investments in athletics do influence application counts.

Another important mission-based metric in higher education is graduation rates. The research on the effects of athletics on graduation rates, like several of the other variables considered here, is mixed. Conceptually, arguments have been made that successful athletic programs should increase the social connection and integration of students on campus, presumably increasing retention and graduation rates (Mangold, Bean, & Adams, 2003). However, the empirical evidence has not been so clean. In support, Mixon and Tevino (2003) found a significant effect of football team success on both freshman retention and graduation rates. Mangold et al. (2003) found the same relationship, but did not find it to be statistically sig-

nificant. However, when basketball success, rather than football success, was modeled, Mangold et al. (2003) found a statistically significant negative effect on graduation rates. Rishe (2003) countered these results, concluding that there was no evidence that athletic success had a negative effect on the undergraduate body, but rather, that schools with major athletic programs have higher graduation rates than other schools (though he attributed this to the additional academic resources offered by these institutions, not their athletic programs' success). Once again, each of these studies is managerially limited, in that the central independent variables are institutional athletic team on-field performance.

Method

The primary purpose of this study was to examine institutional ROIs related to intercollegiate athletic investments, not athletic success. The allocation of resources to intercollegiate athletic programs is a managerial decision that should be evaluated based on the ability of that investment to provide return on important organizational objectives. Institutions of higher education pursue multiple objectives—some fiscal, some non-fiscal. Even private universities, which are not in the same fiscal position as their larger state counterparts, are not focused on financial returns as their sole, or even primary, success metrics (Feezel, 2009). From a mission perspective, most colleges and universities are oriented toward attracting, educating, and graduating students. To that end, we examine the effects of athletic investment, along with other areas of institutional expenditures, on four key outcomes. We studied two financial returns, total core revenues per FTE and revenues from private gifts per FTE; and two non-financial outcomes, application rates and graduation rates. The goal is to better understand the institutional returns achieved by investing in intercollegiate athletics.

Data for this study was extracted from two publically available datasets to construct a panel for analysis. First, we extracted variables measuring institutional characteristics (e.g., size, location, Carnegie classification, etc.); institutional revenues and expenses; and, student application, retention, and graduation information from the Integrated Postsecondary Education Data System (IPEDS). IPEDS is collected and managed by the U.S. Department of Education Institute of Education Sciences (<http://nces.ed.gov/ipeds/datacenter/>). Data were extracted for each year from 2003-2008 for each of the 124 schools that were NCAA Division IA/FBS members during the selected time period. Second, we extracted data on the revenues and expenses (also from 2003-2008) of NCAA Division I-A/FBS athletics programs from the Equity in Athletics

dataset also maintained by the U.S. Department of Education (<http://ope.ed.gov/athletics/>). The resulting panel dataset thus contains five years of data for each of the 124 member schools. Constructing the dataset from these two resources is advantageous in that the data are: publically available, reported annually as per Department of Education requirements (i.e., consistent and complete variables with no missing data), available for nearly all NCAA schools, and collected in a recurring format (allowing year-to-year comparisons).

From the collected data, we transformed all financial metrics into units per full time enrollment (FTE), to control for institutional size. Total dollar revenues and expenses in each of the financial categories were divided by the full-time equivalent undergraduate student enrollment (fall term) to calculate the following variables for this study: Core Revenues per FTE (total institution), Gift Revenue per FTE, Instruction Expense per FTE, Research Expense per FTE, Academic Support Expense per FTE, Student Service Expense per FTE, Institutional Support Expense per FTE, Public Service Expense per FTE, and Athletic Expense per FTE. To these variables, we added unadjusted variables measuring the graduation rate (in percentages) and number of admission applications per FTE.

Total FTE has not been identified by the U.S. Department of Education as a key factor in university graduation rates (U.S. Department of Education, 2011), and data analyses using graduation rate per FTE as the dependent variable did not change the results of this study; consequently, the raw graduation rate percentages for each institution were included in our analysis. FTE and admission applications were highly correlated among the 124 schools included in our sample ($r = .664$, $p = .001$). Therefore, we constructed models using both an adjusted application per FTE figure, as well as the unadjusted applications number, as dependent variables. The substantive results of the models did not differ. We chose, as a result, to include the unadjusted applications model here given its ease of interpretation.

Finally, we included measures of academic ranking (U.S. News & World Report), conference affiliation, and the public/private status of the institution. U.S. News & World Report rankings are regularly used as an indication of the public perception of academic quality (e.g., Stinson & Howard, 2007). As this study's dependent variables are largely outcomes associated with the behaviors of external populations that may not have a good measure of absolute academic quality, U.S. News & World Report rankings serve as an appropriate proxy. Member conference schools are likely to invest in a similar fashion, reflective of their shared culture, philosophy, governance, and resource base

(ASHE, 2003; Sweitzer, 2009). We therefore included a measure of conference affiliation as a control. Finally, the public/private status of the university is a commonly included control variable in higher education studies, capturing the obvious differences in financial structure.

Fixed effects analysis was employed to examine the relative influence of each category of institutional investment (e.g., Instruction Expense per FTE, Athletic Expense per FTE, etc.) on the selected dependent variables (Core Revenues per FTE, Gift Revenue per FTE, Graduation Rate, Student Applications). U.S. News & World Report Rankings, Athletic Conference Affiliation, and Public/Private Status of the school were all included as control variables. Given the five years of panel data available for each of the NCAA Division I FBS schools, fixed effects analysis was the appropriate analysis choice, as it controls for the unobserved, unmeasured heterogeneity across schools and time (Rhoads & Gerking, 2000).

Fixed effects analysis assesses the year-to-year changes in the dependent variables, parceling out the variance attributable to the focal independent variables, from the variance attributable to both the observed institutional differences (e.g., athletic conference, Carnegie classification, private/public status; which were included as control variables within this study) and the unobserved institutional and environmental differences across time. The resulting analyses provide estimates of the explained variance in the dependent variables common across the sampled institutions. In addition, though fixed effects analysis dampens the resulting effect for each of the independent variables as compared to OLS regression, the results provide a stricter, more conservative estimate of the effects of athletic investment across the sample of schools. Therefore, this approach served to critically inform regarding the macro-effects of increased athletic investment. Fixed effects models, which included each of the seven categories of institutional investment (independent variables) and each of the three control variables, were analyzed for each dependent variable. We report the results of each model below.

Results and Findings

The first model examined the fixed effects of the independent variables on the Core Revenues per FTE for each school. While revenue maximization need not be the core objective of the institution, increased pressure for funding sources highlights the needs for universities to generate sufficient revenues to deliver on their institutional missions. The resulting model (see Table 1) indicates that Instruction Expense per FTE, Research Expense per FTE, Institutional Support

Table 1.
Fixed Effects for Core Revenues (total dollars) per FTE

Parameter	Estimate	Standard Error	df	t-value	Sig.
Instruction expense per FTE	1.19	.16	133	7.381	.000
Research expense per FTE	1.28	.16	120	7.607	.000
Public service expense per FTE	0.53	0.27	119	1.942	.054
Academic support expense per FTE	0.05	0.12	247	.402	.688
Student services expense per FTE	-.21	.94	139	-.228	.820
Institutional support expense per FTE	6.00	.42	186	14.052	.000
Athletic expense per FTE	2.12	.71	169	2.972	.003

Statistically significant control variables: sector of institution, US News tier, NCAA conference

Table 2.
Fixed Effects for Gift Revenue per FTE

Parameter	Estimate	Standard Error	df	t-value	Sig.
Instruction expense per FTE	0.04	0.02	178	1.373	.172
Research expense per FTE	0.01	0.02	142	.414	.679
Public service expense per FTE	0.09	0.04	222	2.197	.029
Academic support expense per FTE	0.01	0.02	350	.299	.765
Student services expense per FTE	0.14	0.15	216	.949	.343
Institutional support expense per FTE	-.02	.07	349	-.289	.776
Athletic expense per FTE	0.24	0.09	338	2.684	.008

Statistically significant control variables: sector of institution, US News tier, NCAA conference

Expense per FTE, and Athletic Expense per FTE are all significant contributors to the Core Revenues of the institution. Of particular interest is the fixed effect estimate for Athletic Expense per FTE. For every dollar of Athletic Expense per FTE, \$2.12 of Core Revenues is produced. Clearly, the model indicates a positive return on university investments in athletics; however, it is not clear from this dataset whether those revenues accrue to the institution as a whole, or simply to the athletic program. Other institutional investments also provide positive financial returns. Most notably, the fixed effect estimate for Institutional Support Expense per FTE is \$6.00—it should be noted that the technological infrastructure of the university is a dominant item in this category. Instruction Expense per FTE (\$1 Investment » \$1.19 in Core Revenue per FTE) and Research Expense per FTE (\$1 Investment » \$1.28 in Core Revenue per FTE) also demonstrate statistically significant fixed effects for Core Revenues per FTE. Thus, from a fiscal perspective, institutional investments in these areas are clearly warranted.

Obviously, an aggregated measure of core revenues may mask the particular revenue streams most influenced by the respective areas of investment. While we

do not undertake an exhaustive review of each potential revenue stream here, the effects of athletics on private giving to colleges and universities have been widely studied. Previous research suggests that athletics have a small but significant influence on generating donor support (Martinez et al., 2010). Further, as institutional investments on the part of state legislatures continue to decrease across the country, a renewed focus on generating private support has become paramount at many public colleges and universities. The second model depicts the influence of separate areas of institutional investment on Gift Revenue Generated per FTE (see Table 2). The fixed effect estimate for athletic investment is positive and statistically significant; for every dollar invested per FTE in athletics, a positive return of \$0.24 in gift revenue is estimated. As was the case in the Core Revenue analysis, it is unclear whether the positive returns benefit the entire institution, or only athletic departments.

A surprising finding that was uncovered through this analysis is that academic investments do not appear to have a significant effect on Gift Revenues per FTE. In fact, beside Athletic Expense per FTE, the only other statistically significant fixed effect estimate is related to

Table 3.
Fixed Effects for Applicants (Total)

Parameter	Estimate	Standard Error	df	t-value	Sig.
Instruction expense per FTE	.515	.142	305	3.624	.000
Research expense per FTE	-.548	.145	277	-3.761	.000
Public service expense per FTE	.087	.200	362	.434	.665
Academic support expense per FTE	.053	.086	330	.621	.535
Student services expense per FTE	.817	.716	355	1.14	.255
Institutional support expense per FTE	.117	.286	360	.410	.682
Athletic expense per FTE	.021	.387	330	.056	.955
Statistically significant control variables: sector of institution, NCAA conference					

Table 4.
Fixed Effects for Graduation Rate Total Cohort

Parameter	Estimate	Standard Error	df	t-value	Sig.
Instruction expense per FTE	.00005	.00017	315	.314	.754
Research expense per FTE	-.00007	.00017	286	-.438	.662
Public service expense per FTE	.00013	.00024	372	.532	.595
Academic support expense per FTE	-.00001	.01000	339	-.097	.923
Student services expense per FTE	.0015	.0008	364	1.798	.073
Institutional support expense per FTE	.0004	.0003	369	1.165	.245
Athletic expense per FTE	.00165	.0004	341	3.513	.001
Statistically significant control variables: US News tier, NCAA conference					

Public Service Expense per FTE (\$1 Investment » \$0.09 in Gift Revenue per FTE). Recognizing that both athletic and public service investments possess significant externally focused attributes and benefits should not be lost on administrators concerned with building their brands, nurturing alumni support, and generating donor gifts for their universities.

Financial returns may not be the sole, or even the primary objective of colleges and universities, so for a broader perspective regarding potential returns on investment, we include models for two commonly researched dependent variables: Undergraduate Application Rate and Graduation Rate. The fixed effects model for Undergraduate Application Rate is reported in Table 3. Contrary to some previous findings and anecdotal evidence, the results of the fixed effects analysis do not indicate a significant influence of Athletic Expense per FTE on Undergraduate Application Rate. In fact, only two of the institutional expense categories have statistically significant fixed effects estimates. Instruction Expense per FTE has a positive influence on Undergraduate Application Rate (\$1 Investment » .515 Applications), while Research Expense per FTE has a negative influence on

Undergraduate Application Rate (\$1 Investment » -.548 Applications). These findings make sense intuitively, as higher levels of institutional commitment to instruction attract prospective undergraduate students, while higher levels of research expense are most often associated with a graduate, rather than an undergraduate focus. As a follow-up to the analysis of application rates, we also constructed models examining the relative influence of institutional investments on the test scores of incoming students. Unlike some previous literature, we did not find statistically significant effects, beyond the control variables, on the test scores of incoming students. As a result, we have chosen not to report those models here.

Next, we examined a fixed effects model with graduation rate as the dependent variable. In athletic circles, graduation rates have drawn substantial attention, particularly the graduation rates of student-athletes. The current data set allows a broader examination of this important measure of the core institutional mission. Two interesting findings are highlighted. First, there is a significant positive fixed effect for Athletic Expense per FTE. While the effect is small, the model shows that one method for increasing graduation rates is to

increase athletic spending per FTE. A one dollar increase in Athletic Expense per FTE is estimated to result in a .165% increase in the graduation rate. The second interesting result is that none of the other areas of core institutional investment have a significant effect on graduation rate above that accounted for in the unmeasured, unobserved institutional heterogeneity. The reported investments in core academic areas (i.e., Instructional Expense per FTE, Research Expense per FTE) do not directly influence the reported graduation rates reported in this dataset.

Lastly, as another measure of athletic investment, we reconstructed each of the models using a measure of Athletic Subsidy per FTE as opposed to Athletic Expense per FTE. We calculated athletic subsidy by subtracting athletic department revenues from athletic department expenses, and dividing the resulting total by FTE. Unlike Athletic Expense per FTE, which includes significant athletic department generated revenue, Athletic Subsidy per FTE includes direct institutional investment that theoretically is allocated to athletics at the expense of the academic core. Athletic Subsidy per FTE was not statistically significant in any of the four models. As a result we do not report the full model results here. However, we do return to this set of findings in the discussion section, as the results may have important implications for investment in intercollegiate athletic programs.

Discussion

This study begins to address gaps in the existing knowledge base. One gap concerns the lack of empirical research and quantitatively derived models that include university investments in athletics within the broader context of university program investments. We believe this is requisite to the important questions that are now permeating our discussions of how university administrators should position, market, and brand their institutions, as well as how they should allocate strategic institutional resources in the pursuit of these endeavors.

The idea that athletics and athletic-related attributes contribute positively and/or negatively to individuals' perceptions of institutions of higher education has been anecdotally recognized for years. In a prominent example of this phenomenon, through much of the 1970s, '80s, and '90s, Indiana University basketball coach Bob Knight attracted significant amounts of attention (some positive, some negative) for not only Indiana Hoosiers' basketball brand, but also for IU's higher-order institutional brand. This attention influenced individuals' perceptions of Indiana University, thereby affecting the University's brand equity and ultimately contributing to Knight's departure from the school.

Within the higher education context, there are multiple ways to build value for the current and prospective customers discussed within this study (i.e., students), as well as a full inventory of other important stakeholder groups (e.g., alumni, donors, faculty, staff, administrators, trustees, fans, community, etc.). Not surprisingly, institutional investments in academics provided significant value to student populations; however, importantly, institutional investments in intercollegiate athletics were also significant in providing value to this group.

One of the most important findings in this study relates to what programmatic investments attract the attention of current and prospective students. This study shows that what compels students to submit applications relates to institutional commitments to students' educational experiences. This finding is interesting and informative, as it suggests that core university investments in technology and infrastructure, instructional expense, student support services, and other such activities are more important factors in generating student applications than are institutional investments in athletics.

Perhaps somewhat surprisingly, but also revealingly, institutional investments in athletics were the only antecedent variable to impact universities' abilities to graduate students above and beyond what institutions would typically be expected to graduate. While small, this effect can be profound, as a dollar increase in Athletics Investment per FTE is demonstrated to produce .165% increase in graduation rate. In other words, institutional investment in academics is the primary motivator for getting students "in the door," while institutional investment in athletics is a primary motivator in "keeping them."

The goals and objectives of universities are plentiful, including the desire to create revenue models that lessen the financial burden placed on current and future student populations. This study provides clear empirical support that intercollegiate athletics provide positive returns on investment (ROI) to universities, thereby lessening the financial expectations for current and prospective students. In one of the few empirical studies conducted in this space, Frank (2004) suggested that athletic programs were essentially a fiscal breakeven endeavor for their host universities, providing a dollar return for each one dollar invested. Utilizing a larger and more robust dataset spanning five years of data, and covering the 124 NCAA Division 1A/FBS member colleges and universities from 2003-2008, this research suggests a significantly greater ROI.

As most would expect, institutional investments in activities related to teaching and scholarship are critical to generating core university revenues (\$1 Instructional

Expense per FTE » \$1.19 in Core Revenues; \$1 Research Expense per FTE » \$1.28 in Core Revenues; and \$1 Institutional Support Expense per FTE » \$6.00 in Core Revenues). However, and perhaps surprisingly to some, the second highest revenue returns per FTE related to Athletic Expense per FTE, where one dollar in Athletic Expense produced \$2.12 in Core Revenues. These returns on investment (ROIs) demonstrate strong financial support for institutional investments in athletic programs, provided the institution does not overstep the constraints of the revenues generated. While the limitations of this dataset do not make it possible to tease out what universities are doing with these returns (e.g., reinvesting in athletic programs, or redistributing these monies to other areas of the institution), it is fair to say that these revenues are being used in place of monies that could and/or would have to have been generated through other means. These findings provide great insight and direction for university administrators and trustees as they reflect on the nature of their institutional revenue models.

Previous research has emphasized the importance of creating strong, emotional customer-service brand connections. This research suggests the importance that institutional investments in athletics can have in fostering such connections, given the ability of athletics to nurture strong emotional connections at multiple levels. While this research suggests that both athletics and academics are important, and that both can and do influence the strength of university brands, social identification theory and identity salience theory may provide theoretical foundations for understanding when one or the other will predominate. Different constituents are likely to have different social identities relative to the institution, and the salience of these respective identities may determine the most important influences on institutional brand equity.

This study's findings are both interesting and telling. Former NCAA President Myles Brand argued that it was important that athletic programs be integrated with the academic mission of the university (Brand, 2006). Our findings support Brand's position; however, a number of analyses that we ran actually extended the position/share of athletics within universities' program investment portfolio. Within these analyses, we explored the concept of substituting athletic subsidies (i.e., athletic investments in excess of generated athletic revenues) in place of athletic expense. While athletic expenses were significant through several of the models discussed above, in all of the instances where athletic subsidies were used in place of athletic expense, the replacement models were not statistically significant. This finding is informative, as it suggests that while investment in athletics provides positive ROIs, that

institutional investment in athletics in excess of generated revenues is not associated with producing significant fiscal benefit or outcomes for investing institutions. This means that universities should be diligent in tracking athletic expenses and benefits.

It should be noted that these assessments were made from a purely financial perspective, and did not take into account university subsidies designed to build brand awareness or shape brand meaning. Such occurrences have become increasingly evident over the past generation, as witnessed by Duke, Gonzaga, Butler, etc. in basketball, and Miami, Boise State, TCU, etc. in football. These and many other universities realize that there are multiple avenues to build awareness and meaning. They further realize that an important strategy in building strong brands is to connect with their various constituent groups, which is made significantly easier when these groups are given reason to regularly connect with the university. Intercollegiate sports provide such opportunity.

Contributions, Limitations, and Future Research

Perhaps the most important finding in this study is that both academics and athletics provide positive returns on investment to their host institutions. Compelling ROIs associated with athletics are particularly relevant, as contributions associated with athletics have been questioned across scores of previous studies. While independently interesting, methodological issues related to study design and/or sample size constraints limited the generalizability of many of these previous studies' findings. One of the primary contributions of this study is that it provides solid empirical grounding for many of the important current discussions that focus on how university administrators should position, market, and brand their institutions. Such conversations now have an empirical cornerstone, drawn from a large and robust dataset of five years of data, for each of the 124 schools that were NCAA Division IA/FBS members from 2003-2008.

A limitation of this study that could be addressed in future studies is that data was assessed and analyzed in aggregate. Consequently, it is important to note that while both academics and athletics generate positive ROIs across universities, this may not hold true for all universities individually, and the level of contribution of these two areas is likely university specific. Thus, future studies could assess optimal resource allocations for different universities and/or categories of universities. Anecdotal evidence suggests that certain conditions may lead to one set of antecedents (athletic vs. academic) to be more dominant in affecting ideal university allocations. Future research could continue to explore

the relative contributions of each related to various brand metrics, such as brand equity at the institutional, family, and/or individual brand levels, as well as the impact of both academics and athletics in cases where negative brand equity occurs. Future research could also expand upon this work by including functional, experiential, credential, and attitudinal dimensions, in order to ascertain the degree to which these dimensions are able to enhance institutional ROIs.

While the analyses within this paper empirically trace the effects of core activities on student populations, one of the central areas of communicating and leveraging service brands occurs through internal branding efforts (Berry, 2000; Davis, Golicic, & Marquardt, 2008). The constraints of the existing panel dataset do not make it possible to assess the impact on internal stakeholder groups such as faculty, staff, and university administrators and trustees, nor on external stakeholder groups such as alumni, donors, and supply chain partners—so there is considerable opportunity to expand on the findings of this work by exploring the true brand effects across different stakeholder groups.

Lastly, universities should recognize and appreciate areas discussed in this study as they relate to points-of-parity and points-of-difference. These important branding concepts suggest that organizations should strive to achieve parity on certain customer-valued attributes, benefits and consequences, while striving to create differentiation on others. Institutional investment in athletics provides one means by which to pursue these objectives.

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