

The Relationship Between Big-Time College Football and State Appropriations for Higher Education

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Abstract

Do big-time college sports affect state appropriations to public colleges and universities? Little attention has been given to the possibility that big-time athletic programs generate economic benefits for a university at the state capital. The paper estimates a reduced form model of the determination of annual state appropriations to public universities, including institution-specific effects to control for unobservable factors like mission and reputation that could affect appropriations. The results suggest that institutions fielding Division I-A football programs receive 8% more in annual state appropriations — about \$2.6 million in real 1982 dollars — than those without such programs. Bowl appearances and national rankings do not lead to additional appropriations. These results suggest that the total economic benefit associated with big-time athletic programs may be larger than previously thought and provide insight into why the number of institutions fielding Division I-A college football programs increased by 10% from 1998 to 2002.

Keywords: higher education finance, intercollegiate athletics, political influence

Introduction and Motivation

Unlike the rest of the world, colleges and universities in the United States, and to a lesser extent Canada, operate large scale athletic programs. Intercollegiate athletics at U.S. colleges and universities goes well beyond fitness and recreation programs. According to the most recently available data, the average American college or university operated an athletic department with 374 male and female athletes drawn from the student body and fielded competitive teams in 15 different sports. The largest

intercollegiate athletic programs had nearly 600 male and female athletes and fielded an average of 17 teams. According to data in Fulks (2005), the total revenues earned by college and university athletic programs at all levels in 2003 were \$5.6 billion.

What benefits do intercollegiate athletics provide to these colleges and universities? The size of the economic impact of intercollegiate athletics on universities is a hotly debated topic among researchers, decision makers at universities, and politicians. The issue turns on

whether or not intercollegiate athletics drain or contribute to university budgets. This debate is important because intercollegiate athletics are highly visible parts of universities, commanding considerable economic resources. In many instances, claims of large indirect benefits are the primary justification for large expenditures on high profile intercollegiate athletic programs.

Intercollegiate athletics generate both direct and indirect economic benefits to universities. The direct benefits include ticket, concession, and parking revenues associated with hosting games; television and radio revenues; payments for postseason appearances; and the sale of licensed merchandise bearing the institution's name and logo. Zimbalist (1999) points out that idiosyncratic accounting practices make it difficult to separate economic benefits accruing to the athletic department from those accruing to the rest of the university. Prior research on the indirect economic benefits of intercollegiate athletics has focused primarily on the effect of success in intercollegiate athletics on charitable giving and on enrollment and the quality of students. Among these indirect benefits, attracting only higher quality students may not produce tangible returns to the institution.

This paper examines the effect of intercollegiate athletics on the size of state government's appropriation to institutions of higher education. Supporting the idea that intercollegiate athletics can have an important effect on state funding, Zimbalist (1999) recently discussed the possibility of intercollegiate athletics "arousing legislative largess among sports-crazed representatives" (page 152). Also, Shapiro (1983) provides support for the important role played by big-time athletics in the growth of Michigan State University.

This paper examines factors that affect the subsidy given by state governments to public universities. The universities vie with other agents for government support and operate athletic departments that train athletes and compete in a wide variety of competitions, among other functions. In general, governments all around the world provide subsidies to sport. These subsidies take many forms, many of which go to national organizing bodies for particular sports. Like universities in the United States, these agents also compete for scarce government dollars, so understanding the sports-related factors that

affect subsidies in universities in the US can also help to understand the general mechanism through which governments subsidize sport.

Literature on the Financial Impact of Intercollegiate Athletics

No clear consensus exists on the relative magnitudes of the benefits and costs associated with intercollegiate athletics. Some researchers conclude that intercollegiate athletic departments run operating deficits, while others conclude that intercollegiate athletic departments generally break even or run modest surpluses. The lack of generally accepted accounting practices in the financial accounting of intercollegiate athletics contributes to this problem. Zimbalist (1999) argued that many operating costs are hidden by non-standard accounting practices and, while the most extreme positive revenues are reported in the popular press, most athletic departments at large universities operate in the red. Litan, Orszag, and Orszag (2003), in a recent study commissioned by the National Collegiate Athletic Association (NCAA), reported that increases in expenditure on football and basketball were not associated with any increase in net operating revenue in Division I-A athletic programs. Fulks (*various years*) produces biennial surveys of the financial conditions of intercollegiate athletic programs. According to Fulks (2003), between 35% and 51% of Division I-A athletic programs reported annual operating surpluses over the period 1985-2003.

The NCAA is the primary organization that regulates intercollegiate athletics in the United States. The NCAA, founded in 1905, currently oversees 1,034 intercollegiate athletic programs at colleges and universities. NCAA regulations apply to almost every aspect of intercollegiate athletic programs, from the number of teams that must be fielded and how much financial support can be given to student-athletes, to the number of contests that can be held in each sport. The NCAA classifies intercollegiate athletic programs into three divisions by size of program: Division I, Division II, and Division III. Division I athletic programs, with 327 members, are the largest, and many of the teams fielded by Division I programs play in sports facilities comparable to those used by the top professional North American sports teams. Division I athlet-

ic programs offer financial support, in the form of scholarships, to participating students. Division II programs, with 282 members, are smaller, having fewer athletes and fielding fewer teams but still offer scholarships. Division III, with 461 members, is the smallest in terms of number of athletes and sports teams fielded, and offers no scholarship support to participants.

Goff (2000) performed a thorough case study of the overall financial impact of intercollegiate athletics at a relatively low-profile Division I school, Western Kentucky University. After accounting for various accounting peculiarities, Goff concluded that the athletic department at Western Kentucky ran modest surpluses in most years. Goff argues that if this is true at Western Kentucky, it may also be true at other similar institutions, suggesting that many Division I athletic departments operate in the black on average. Although this study examines a single low-profile university, Goff's careful and thorough analysis suggests that some other athletic departments might run similar surpluses under this type of scrutiny.

The idiosyncratic nature of the accounting practices used at universities makes the assessment of the total economic impact of intercollegiate athletics difficult. For example, Litan et al. (2003) document wide variation in accounting for capital expenditure and indirect costs at intercollegiate athletic departments. Typical accounting inconsistencies include assigning the revenues and expenses generated by athletic events to a variety of non-athletic accounts within the institution, or in some cases to other outside entities like booster clubs. Despite the disagreement over the net impact, some evidence that intercollegiate athletic programs generate some indirect economic benefits exists in the literature.

The research on indirect benefits of intercollegiate athletics has overlooked one important potential source of indirect benefits, appropriations from state governments. To date, no detailed study of the relationship between intercollegiate athletics and government appropriations has been carried out. This relationship may be important because most big-time college athletic programs are public institutions and public institutions receive a large portion of their revenues in the form of appropriations from state governments. Based on data collected for this study, over the period 1974-2000, 150 institutions sponsored a

Division I-A football team, the largest classification of schools in the NCAA, for two or more seasons.¹ Eighty percent of these 150 athletic programs are public universities. Over this 26-year period, appropriations from state governments accounted for 32% of each institution's current fund revenues, a larger share than revenues from tuition and fees, 19%, or revenues from charitable donations, 4.7%, the primary focus of previous research on indirect economic benefits from intercollegiate athletics. Also, appropriations from state government are part of the state budgeting process and should not be affected by the irregular accounting practices that plague other athletic accounts.

Athletics and Government Appropriations

There are many reasons to believe that an institution's annual appropriation from the state government could be affected by the presence of intercollegiate athletics. A number of these explanations emerge from the predictions of Becker's (1983) model of competition for political influence among pressure groups. In the context of Becker's model, pressure groups are any formal or informal organization that has an interest in promoting particular government policies. In this model, the influence gained by pressure groups depends, in part, on the efficiency of each group at producing political pressure. In the context of Becker's model, universities, alumni, and athletic boosters can be interpreted as pressure groups vying for influence in state legislatures with other pressure groups. A big-time intercollegiate athletic program, as well as success on the playing field, can be viewed as methods for generating political pressure in state legislatures. Thus this paper is a limited test of Becker's model of political influence, applied to state appropriations to higher education.

Many taxpayers in states and state legislators are alumni of a state's public institutions of higher education. Other residents of a state who are not alumni may follow the big-time athletic teams in that state; these individuals can be interpreted as a pressure group competing with other groups—perhaps including alumni and boosters of another rival university in a state—for political influence in state legislatures. In this model, the political influence

obtained by each pressure group depends on how efficient each group is in producing pressure. Prominent and successful athletic programs can be interpreted as one way of efficiently generating political pressure.

For states without major professional sports teams, like Nebraska, Oklahoma, Alabama, Iowa, Arkansas, Kentucky, and others, the big-time athletic programs at public universities may be the only prominent local sports teams. Larger state subsidies for the major college teams in these states may play a role similar to the subsidies given to professional sports teams for stadium construction in large cities.

Intercollegiate athletics may also be interpreted as a signal of overall quality of the output of a school by state legislators. The benefits of an outstanding department in the humanities, or high quality undergraduate instruction, might not be apparent to the state legislators deciding on the annual appropriation to a public university, but fielding a successful Division I-A football team puts the university in the news frequently and prominently. Also, football games are a likely place for administrators to lobby key legislators, providing schools with big-time athletic programs with a competitive advantage in lobbying legislators. These factors all suggest that state appropriations to individual institutions of higher education may be affected by the presence of big-time intercollegiate athletics.

When viewed in the context of Becker's model of competition for political influence, the topic examined in this paper has important implications for the financing of sport in a wide variety of settings. Governments all over the world provide financial support for sports, and all governments face pressure groups with unlimited demands for the funding of many programs and budget constraints that allow for limited funding of programs. For example, Green (2004) recently reviewed the sport funding decisions made by the Great Britain Sports Council over the past 30 years and found a shift in proprieties away from funding mass participation activities and toward funding international performance and other elite policy objectives. In this setting, pressure groups advocating for funding for community-wide sport participation programs and sports facilities intended for use by the wider community are competing with regional and sport boards and the governing bodies for specific sports

that compete in the Olympic Games and World Championships for funding. Since the Great Britain Sports Council has limited funds to allocate to different groups, Becker's model predicts that those groups that can most effectively lobby government decision makers will receive more funding. Understanding how educational funding decisions made by state legislators in the US respond to on-field events can help to explain why the Great Britain Sport Council decided to fund elite athletes instead of community based sport programs.

Empirical Modeling Approach

A linear reduced form empirical model of the determination of annual state appropriation to individual institutions of higher education is used to assess the impact of intercollegiate athletics. Although a formal economic model of the determination of appropriations is not developed, simple linear reduced form models like this one can be motivated by the optimality conditions from a wide variety of economic models either in a general equilibrium setting or from a public choice perspective. [See, for example Garvin (1980), Creedy and Francois (1990, 1993) and the discussion in Hoenack and Pierro (1990).] The general form of this empirical model is

$$A_{i,j,t} = bX_{i,t} + fZ_{j,t} + e_{i,j,t} \quad (1)$$

where $A_{i,j,t}$ is the state government's appropriation to institution i in state j in year t , $X_{i,t}$ is a vector of institution-specific factors that might affect state appropriation to the institution in a given year, $Z_{j,t}$ is a vector of state specific economic controls that might affect year t s appropriation to higher education in state j , $e_{i,j,t}$ is a mean zero, constant variance equation error term capturing other factors that affect annual state appropriation to public institutions of higher education, and b and f are vectors of unknown parameters to be estimated. Although a few large public institutions of higher education receive direct appropriations from the federal and local governments, state appropriations constitute the largest source of appropriated government funds.

Humphreys (2000) showed that aggregate state appropriations to higher education are sensitive to business cycle conditions. Because tax revenues are procyclical and

many state governments face annual balanced budget constraints, state appropriations to higher education tend to rise and fall with the business cycle. For this reason, it is important to control for the effects of the business cycle on state appropriations to individual institutions.

Other institution-specific factors also affect the level of state appropriations to institutions of higher education. Many states have adopted formal funding formulas that link the level of appropriation to enrollments or other factors like the size of the physical plant. In other states, informal funding formulas are used. However, considerable latitude exists in the relationship between state appropriation and enrollments even in states with formal funding formulas. For this reason the empirical model includes a vector of observable institution-specific variables rather than explicitly modeling the funding formulas.

Other factors, like the mission of the institution and the market served by each institution, may also affect the level of state appropriation given to institutions. Institutions with significant research missions or comprehensive land-grant universities charged with providing education in a wide variety of disciplines may have different funding than institutions located in the suburbs of large cities with large numbers of non-resident part-time students including working adults. In any event, the variables in $X_{i,t}$ should reflect the factors specific to each institution that affect the level of state appropriation.

$X_{i,t}$ also contains variables related to the intercollegiate athletic performance and offerings at each institution. These include indicator variables for the presence of a Division I-A football program, appearances in postseason bowl games, and final poll rankings. The parameters esti-

mated on these variables will be used to assess the impact of intercollegiate athletic offerings on the level of state appropriations.

Data

The US Department of Education conducts an annual survey of enrollment and financial conditions at institutions of higher education.² These surveys form the basis for a panel of enrollment and financial data for all public U.S. institutions of higher education at the Baccalaureate level or higher over the period 1975-1996. The Financial Statistics survey results are not available for years after the 1996-1997 academic year at this time, limiting the period of analysis. Some financial data from the period after 1996 are available, on an irregular basis, but adding these years to the current data set would yield an unbalanced panel with observations missing from many years at the end of the sample. Until more data are made available by the Department of Education, the current sample will have to suffice. If, or when, adjudicated data from the Financial Statistics survey become available for every year in the period after 1996, this research should be updated with more recent data. Using only public institutions that were in the surveys for the entire 1976-1996 period produced a balanced panel with 570 institutions. Omitting institutions with missing observations over this period eliminates less than 5% of the observations for public colleges and universities at the Baccalaureate level or higher in the HEGIS/IPEDS survey universe.

The National Center for Educational Statistics also publishes price indexes appropriate for use with data for institutions of higher education. These include the

Table 1. Variable Descriptions, Sample Means, and Data Sources

Variable	Definition	Mean	Source
$A_{i,j,t}$	Annual Real State Appropriation	\$31,600,000	IPEDS Finance Survey
$GRE_{i,t-1}$	Graduate Enrollment	1,050	IPEDS Enrollment Survey
$UGE_{i,t-1}$	Undergraduate Enrollment	6,194	IPEDS Enrollment Survey
$INC_{i,t}$	Real State Personal Inc. Per Capita	\$12,995	BEA Regional Accounts
$GINC_{j,t-1}$	Growth, Real Personal Inc. Per Capita	1.33%	BEA Regional Accounts
$D1_{i,t-1}$	=1 if Football Team is Division 1-A	0.16	NCAA Football
$BG_{i,t-1}$	Team Appeared in Bowl Game	0.046	NCAA Football
$FR_{i,t-1}$	=1 When Team Ranked in Final Polls	0.032	NCAA Football

Higher Education Price Index (HEPI) and a version of the Consumer Price Index (CPI) calculated on an academic year (July-to-July) basis. The HEPI was used to deflate the nominal state appropriation data for each institution.

Detailed data on the performance of NCAA Division I-A football teams can be found in the annual publication *NCAA Football*. Performance measures for NCAA Division I-A football teams were extracted from these annual publications. The Bureau of Economic Analysis (BEA) of the US Census Bureau publishes data on state personal income and state population.³ Estimates of state personal income and state population were obtained from the BEA. Personal income was deflated using the Consumer Price Index. Table 1 shows the relevant variables, their means, and the source of each variable.

Empirical Estimation and Results

The vector $X_{i,t}$ contains variables that reflect the effects of factors specific to each institution on the level of state appropriation. Among the most important of such factors are those related to the specific mission of each institution and the markets served by each institution. This analysis uses two variables to capture these effects. The number of Full-Time Equivalent (FTE) undergraduates and FTE postgraduate students enrolled in the Fall semester of each academic year at each institution. FTE enrollment counts three part-time students as one full-time student, roughly correcting for the propensity for some institutions to attract part-time students, who typically live off-campus and work part- or full-time, and may also be outside the traditional 18-22 year-old age bracket of undergraduates. Including undergraduate and postgraduate enrollment separately also reflects the scale and intensity of research activities at each institution, as those institutions with extensive research missions will tend to enroll more postgraduate students than institutions with more intensive educational missions. Enrollment also proxies for the size of the institution.

$X_{i,t}$ also contains variables that reflect the intercollegiate athletic offerings of each institution. Initially, a simple dummy variable that is equal to 1 if the institution is a member of the NCAA's Division I-A, the largest classi-

fication of NCAA athletic programs, is used, although other measures of athletic offerings and success are later included.

$Z_{i,t}$ is a vector of state specific economic controls. Economic conditions affect state budgets, primarily through their effect on revenues. Changes in state government revenues may also affect state appropriations to higher education. Real state per capita personal income and the growth rate of this variable serve as proxies for the economic conditions in each state.

The intercept term in Equation (1) is assumed to contain both an institution-specific effect and a year-specific effect. The year dummy variables capture any factors that affect all institutions in the sample in a particular year. These factors include national business cycle effects, federal government policy changes, and factors common to the entire cohort of students entering higher education in a particular year. This three-way fixed effects model takes the form

$$A_{i,j,t} = a_i + s_j + t_t + bX_{i,t} + fZ_{j,t} + e_{i,j,t} \quad (2)$$

An overall time trend (t_t), institution-specific dummy variables (a_i), and state-specific dummy variables (s_j) also appear in all specifications. The time trend captures any systematic changes in higher education funding that affect all institutions in the sample period. State-specific dummy variables control for unobserved state-specific factors that affect the level of funding to public colleges and universities, including the presence of professional sports franchises in the state and variation across states in the level of interest in big-time college football. Institution-specific dummy variables capture any time-invariant factors at each institution in the sample that might affect state funding. These factors could include "flagship" designation, the presence of professional sports franchises in the area, the location of the institution, and other factors.

The level of state appropriation to higher education is typically set before the start of the academic year in states, although the exact timing varies somewhat across states. This raises the possibility that explanatory variables dated in period t will be correlated with the equation error term. To avoid this endogeneity problem, all of the

Table 2. Results of OLS Estimation of Equation (1)

Dependent Variable: Real State Appropriation per Year			
Variable		Model 1	Model 2
Real State Per Capita Income	$INC_{j,t-1}$	1,422 * (139)	1,423 * (139)
Growth in State Per Capita Income	$GINC_{j,t-1}$	426,093 * (47415)	426,191 * (47421)
FTE Graduate Enrollment	$GRE_{i,t-1}$	2,526 * (253)	2,523 * (253)
FTE Undergraduate Enrollment	$UGE_{i,t-1}$	1,385 * (98)	1,381 * (98)
Division I-A Indicator	$D1_{i,t-1}$	2,654,323 * (777,014)	2,640,947 * (777,626)
Bowl Game	$BG_{i,t-1}$	—	207,172 (602,608)
Final Poll Ranking	$FR_{i,t-1}$	—	215,084 (706,440)
Time Trend		-325,437 * (37,198)	-325,527 * (37,206)
N		10,759	10,759
R ²		0.97	0.97

Note

* Significant at 1% level

explanatory variables are lagged to period $t-1$ in the model. A recent survey by the National Association of State Budget Officers (NASBO 1996) reported that 11 states operate on biennial budgets for higher education appropriations, suggesting that variables lagged a single year might be endogenous in these states. Lagging all the explanatory variables two years produced similar results to those reported here, suggesting that the results reported on Table 2 do not suffer from this problem.

Table 2 shows the results of estimating the linear reduced form model of the determination of state appropriation to institutions of higher education defined by Equation (2) using OLS.⁴ The parameter estimates and standard errors for the institution-specific intercepts and year dummy variables are not reported, but are available on request. Model 1 contains an indicator variable for Division I-A athletic programs as a proxy for the effect of intercollegiate athletics on state appropriation to higher

education. All variables in Model 1 are statistically significant using a two-tailed test at the 1% level or better.

The parameter on the indicator variable for participation in Division I-A football is positive, suggesting that public institutions with big-time college football programs receive a larger annual state appropriation than public institutions that play football at lower levels or have no intercollegiate football program, even when unobservable institution-specific factors, the effects of funding formulas, and state-specific economic conditions are controlled for.

The parameters on the other explanatory variables are correctly signed and significant. The real per capita income variable suggests that state appropriations are pro-cyclical and that each \$1 increase in real per capita income increases state appropriation to an institution of higher education by \$1,422; the annual state appropriation rises and falls with the previous year's level of real state income per capita. The elasticity of this estimated

parameter is 1.13 at the sample means, suggesting that the percent increase (decrease) in state appropriation to institutions of higher education is more than proportionate to the percent increase (decrease) in the level of real state income per capita in the previous year. This elasticity is close to the elasticity reported by Humphreys (2000), 1.42, using data aggregated to the state level.

The annual state appropriation also rises and falls with the growth rate of real per capita state income. Including the growth rate of real per capita state income along with the level ensures that business cycle effects are being controlled for in the empirical model in the event that the level of real per capita state income reflects only cross-state differences in the ability to pay for higher education. Again, the explanation for these effects is that state tax revenues also rise and fall with state per capita income and many state legislators face annual balanced budget requirements. As Humphreys (2000) showed, states tend to balance their budgets in periods of falling tax revenues by reducing appropriations to higher education.

The enrollment variables are positive, suggesting that state appropriation rises with the size of the student body. The parameters on the FTE graduate and undergraduate variables suggest that institutions receive considerably more state funding for a FTE postgraduate student than for a FTE undergraduate. This may be evidence of greater state funding for institutions of higher education with research missions and comprehensive land grant institutions with many programmatic offerings at the postgraduate level.

The parameter on the overall time trend is negative and significant. This variable reflects a secular decline in state support for higher education throughout the sample period. The decline was over \$300,000 per year on average to the public institutions in the sample.

Model 2 adds several additional measures of football success to Model 1. These variables, indicator variables for an appearance in a bowl game in the previous year and an appearance in the final Top 20 or Top 25 polls, reflect not only the presence of a Division I-A football team but also the on-field success of the team. The parameters on the indicator variables for bowl appearances and top 20/25 rankings were not statistically different from zero.

Discussion

The results suggest that institutions with a Division I-A football program receive more state funding than those without such programs. One explanation for this increase in appropriation is that a big-time football program allows a university's administration, alumni, and athletic boosters to produce political pressure more efficiently, because of the visibility of the team and the lobbying opportunities generated by home football games. The size of the estimated impact of Division I-A football on state appropriation is about \$2.6 million real 1982 dollars—or about 8% of the sample average annual appropriation—implying that public universities with Division I-A football programs receive an annual state appropriation that is 8% higher than public universities that do not field Division I-A football teams, other things equal.

The results from Model 2 suggest that size of the state appropriation in any year varies with the presence of a Division I-A football program but does not depend on the success of the football program in the previous year. This result also has important implications for the financing of intercollegiate athletic programs and for understanding the broader financial impact of intercollegiate athletics. A considerable amount of emphasis is placed on the financial benefits from successful athletic programs. The popular press is filled with stories about bowl payouts, television appearance fees, and other financial benefits accruing to winning football teams. Litan et al. (2003) discuss the existing research literature on the benefits of *successful* athletic programs. The results presented here suggest that the presence of a Division I-A football program leads to increased state appropriations, but a winning football program does not lead to any additional state appropriations. Simply operating a Division I-A athletic program at a public university appears to have a positive impact on the university's finances, but additional spending in an effort to field a successful team does not, in contrast to the conventional wisdom that only successful intercollegiate athletic programs generate financial gains.

Returning to the relationship between this research and the changes in sport-related funding in Great Britain documented by Green (2004), state government decision

makers appear to reward prominent sports programs, but not necessarily successful sports programs, perhaps because the presence of a prominent sports program allows for more effective lobbying of the decision makers. According to Green (2004), the Great Britain Sport Council shifted its funding priorities away from community-based participation programs and toward support for elite athletes who compete in Olympic and World Championship events. This could be because the associations that promote sports played at the elite level are better able to lobby government decision makers, because of the aura and prominence of world-class athletes and events, than local organizers of athletic participation programs. Alternatively, the government decision makers might simply prefer to fund high-profile athletic programs over low-profile community-based programs. In either case, those making funding decisions at the Great Britain Sport Council appear to have behaved similarly to state legislators when making sport funding decisions.

Conclusions and Future Research

Public colleges and universities with big-time intercollegiate athletic programs appear to receive a larger annual appropriation from state governments than those that do not have such programs. The indirect financial benefits, in terms of increased funding from the state government, flowing from big-time football programs make important additions to universities' general fund revenues. According to the results in this study, the presence of a big-time football program increases state appropriations by 8%, other things equal. This increase in appropriation can be explained in the context of Becker's (1983) model of competition among political interest groups.

The increase in state appropriation documented here helps to explain why a number of universities have recently added Division I football programs. From 1988 to 2002, 13 universities (Boise State, Buffalo, Central Florida, Connecticut, Idaho, Louisiana-Monroe, Louisiana Tech, Marshall, Middle Tennessee State, Nevada, North Texas, South Florida, and Troy) added Division I football programs to their athletic departments, an increase of about 10%. All of these institutions are public. These universities may have added Division I

football programs to offset the general decline in state support for higher education over this period documented by McPherson and Schapiro (1997). The time trend parameter shown on Table 2 indicates that state appropriations declined by, on average, just over \$300,000 per year during 1976-1996. If the addition of a Division I-A football program leads to more effective lobbying of state legislators and regulators and thus increases state appropriations by \$2,600,000, then many years of declining state appropriations could be offset. However, this study does not address the dynamics of the adjustment from Division I-AA to Division I-A. Future research could focus on the experience at these 13 institutions to determine how much time elapsed before state funding increased and other details of the adjustment process.

In terms of the ongoing debate on the profitability of intercollegiate athletic programs, the results in this paper show that the overall economic benefits generated by big-time athletic programs are larger than previously thought and that these benefits extend beyond the athletic department. Athletic programs at public universities may generate significant economic returns for the institution in any given year, because previous studies did not account for the effect of intercollegiate athletics on state appropriations. Furthermore, the indirect economic benefits documented here go into the general revenue fund at universities, not to the athletic program. In this sense, they may help to further the broader educational and research missions of public colleges and universities.

Other countries subsidize sport at many different levels. Given the results presented here, future research could examine the pattern of subsidies to national sports teams and programs in other countries to see if athletic success is rewarded in other settings. For example, most nations, including developing countries, around the world operate national football (soccer) teams. The hypothesis that the amount of public support for these teams varies with their on-field success is clearly testable.

Division I-A men's basketball programs also produce significant publicity for universities and may improve the ability of institutions to lobby state officials. Over 300 colleges and universities sponsor Division I basketball programs, and a number of Division II programs have recently moved up to Division I. Future research should

examine the effects of big-time college basketball on state appropriations to higher education. Also, state government agencies often pay public universities for “sponsored research” that can be anything from actual research to contracting out for routine administrative work in the guise of research contracts. To a lesser extent, local governments, school districts, park districts, chambers of commerce, and visitor’s bureaus contract out to universities for similar services. If the bureaucrats that make these decisions are also fans of the football team, it could make it easier for faculty to get these types of awards, so the presence and success of a Division I-A football program may lead to increased grants and contracts from various government bureaus and other funding agencies. The data set used here also contains variables capturing these revenues, making this a potentially fruitful future research topic. The persistent trend of declining state support for institutions of higher education places a premium on generating new revenue sources, and on understanding the determinants of these revenue streams.

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Endnotes

¹ NCAA records indicate that five Historically Black Colleges and Universities (HBCUs), Alcorn State, Grambling, Jackson State, Southern University, and Texas Southern, played Division I-A football for a single season, 1977. In this case I treat these schools as members of the smaller Division I-AA throughout the sample period.

² Since 1986, this survey has been called the Integrated Postsecondary Educational Survey (IPEDS). Prior to 1986, it was called the Higher Education General Information Survey (HEGIS). Both are actually annual censuses of all accredited postsecondary educational institutions. These data are available on-line at the National Center for Educational Statistics (<http://nces.ed.gov>).

³ Available on-line at <http://www.bea.doc.gov/bea/regional/spi/>.

⁴ The Newey-West estimator was also used to correct for heteroskedasticity and AR(1) serial correlation and the Huber-White “sandwich” estimator to correct for heteroskedasticity in the standard errors. These corrections had no impact on the sign or significance level of the estimated parameters, so I have reported the OLS results. The asymptotic standard errors from the Newey-West and White-Huber corrections are available by request.

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