

BIG-TIME RESEARCH AND BIG-TIME SPORTS

Comparing Commercialization in Public Institutions

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This research was completed with support from a challenge award provided by the Knight Commission on Intercollegiate Athletics to encourage use of its NCAA Division I Athletics & Academic Spending Database. The Knight Commission does not take a position on the findings produced by the research.

ABSTRACT

This report puts the institutional subsidy for big-time intercollegiate athletics in context with institutional subsidy for another major form of commercialization in higher education: big-time research. Many of the institutions with high-profile Division I football programs are the same colleges and universities that generate much of the patent and research activity in higher education (Clotfelter, 2011).

Since the Bayh-Dole Act of 1980, there has been an increase in the institutional subsidy to support patents and defend them against infringement. We introduce a measure of this institutional subsidy for pursuing and protecting patents and draw comparisons to institutional subsidies for intercollegiate athletics using data from the Knight Commission Athletic & Academic Spending Database for NCAA Division I and the Association of University Technology Managers Statistics Access for Tech Transfer database.

Results from this comparative analysis are situated in the framework of third parties and status systems built on conference alignment (Sauder, 2006; Lifschitz, Sauder, & Stevens, 2014). Findings from this analysis make a contribution to the public dialogue on institutional support for athletics. This report presents a measure of institutional subsidy for commercializing research and provides a comparison between commercialization in big-time research and big-time sports in higher education.

Big-Time Research and Big-Time Sports: Comparing Commercialization in Public Institutions

The relationship between intercollegiate athletics and higher education, especially big-time college football, is often cast as a tension between educational values and economic interests. Big-time college sports generate entertainment revenues that sit in contrast to other spending in higher education.

Or do they?

Spending in intercollegiate athletics is most often compared to academic spending in higher education (Desrochers, 2013; Hirko, Suggs, Orleans, 2013). The median academic spending at Football Bowl Subdivision (FBS) institutions was nearly \$16,000 per full-time equivalent (FTE) student in 2014, but median spending per athlete was almost \$110,964 (Knight Commission, 2016). In addition, the institutional athletic subsidy to support athletics spending is on the rise at many institutions. From 2005 to 2010, total institutional athletics subsidy per undergraduate student at institutions with less external revenue grew more than those with greater levels of external revenue (Cheslock & Knight, 2012). Subsidies from student fees or other institutional contributions are increasingly called into question (Wolverton, Hallman, Shifflett, & Kambhampati, 2015).

However, escalation in spending in higher education is not limited to intercollegiate athletics. With declining state and federal resources and strong interest in innovation through research, institutions compete for faculty who can attract research dollars, develop expert knowledge, and produce research findings that result in patents and the creation of startup companies. Institutions compete with one another for faculty talent, academic prestige, and the increased opportunities available in the market economy of American society. Increasingly, institutions seek active participation in global university rankings (Portnoi & Bagley, 2015). Universities also compete in an academic research market with multinational corporations and share several parallels with the global sports entertainment marketplace. Academic research spending in these global markets, also known as academic capitalism (Slaughter & Rhoades, 2004; Radder, 2010; Rosovsky 1990), includes a key commercial activity in the licensing and protection of research patents.

How do we put the escalation in athletic spending in context of other forms of institutional commercialization? The current models that illustrate increases in athletics spending draw comparisons to instructional spending and use per student-athlete and per student figures. This report illustrates the institutional level of analysis in two areas of commercialization in higher education – institutional athletics subsidy (through student fees, institutional transfers, and other forms of government or institutional support) and institutional patent subsidy (spending in the pursuit, protection, and licensing of patents) among 77 public institutions with Division I FBS football programs.

This report puts the institutional athletic subsidy for big-time intercollegiate athletics in context with another form of institutional commercialization subsidy. Specifically, we illustrate the institutional dollars spent pursuing and protecting big-time research in higher education – i.e., money invested in supporting institutional research (not counting federal grants) and institutional involvement in the patent system – and draw comparisons to institutional subsidies in intercollegiate athletics. We also compare institutional subsidy among

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conferences, Automatic Qualifying (AQ) and non-Automatic Qualifying (non-AQ) conference status, and by Basic Carnegie Classification for the reporting period 2004-2012. AQ and non-AQ status reflect some Division I football postseason eligibility and some NCAA policymaking. Carnegie status reflects research and degree granting activity among U.S. higher education institutions (Carnegie Classification, 2016).

We use the Knight Commission's definition of institutional subsidy for athletics, which includes: general funds, state or other government support, student fees, or indirect facilities and administrative support (Knight Commission, 2016). When comparing institutional subsidy to commercial activities in athletics with subsidy in research and patents, we find that:

Public institutions with Football Bowl Subdivision (FBS) athletic programs invest more institutional funds for patent investment and protection per student than the institutional subsidy per student for intercollegiate athletics (Figure 1).

- Median investment in patent activity was \$1,964 per student in 2004 and grew to \$3,009 per student in 2012, an increase of 53%.
- Median investment in athletics activity (subsidy) was \$199 per student in 2004 and grew to \$325 per student in 2012, an increase of 63%.

The gap between patent and athletics subsidy per student is greater among FBS AQ conferences than non-AQ conferences (Figure 2 & Figure 3).

- Median investment in patent activity among AQ conferences was \$3,214 per student in 2004 and grew to \$4,392 per student in 2012, an increase of 36%. Athletics subsidy was \$130 per student in 2004 and \$152 per student in 2012, an increase of 16%.
- Median investment in patent activity among non-AQ conferences was \$918 per student in 2004 and grew to \$1,353 per student in 2012, an increase of 47%. Athletics subsidy was \$410 per student in 2004 and \$773 per student in 2012, an increase of 89%.

In this report the institutional investment to obtain and enforce patents is characterized as big-time research and the institutional investment in intercollegiate athletics is characterized as big-time college sports. These measures describe how commercialization activities compare and sit in contrast to the other aspects of spending on the educational mission of higher education.

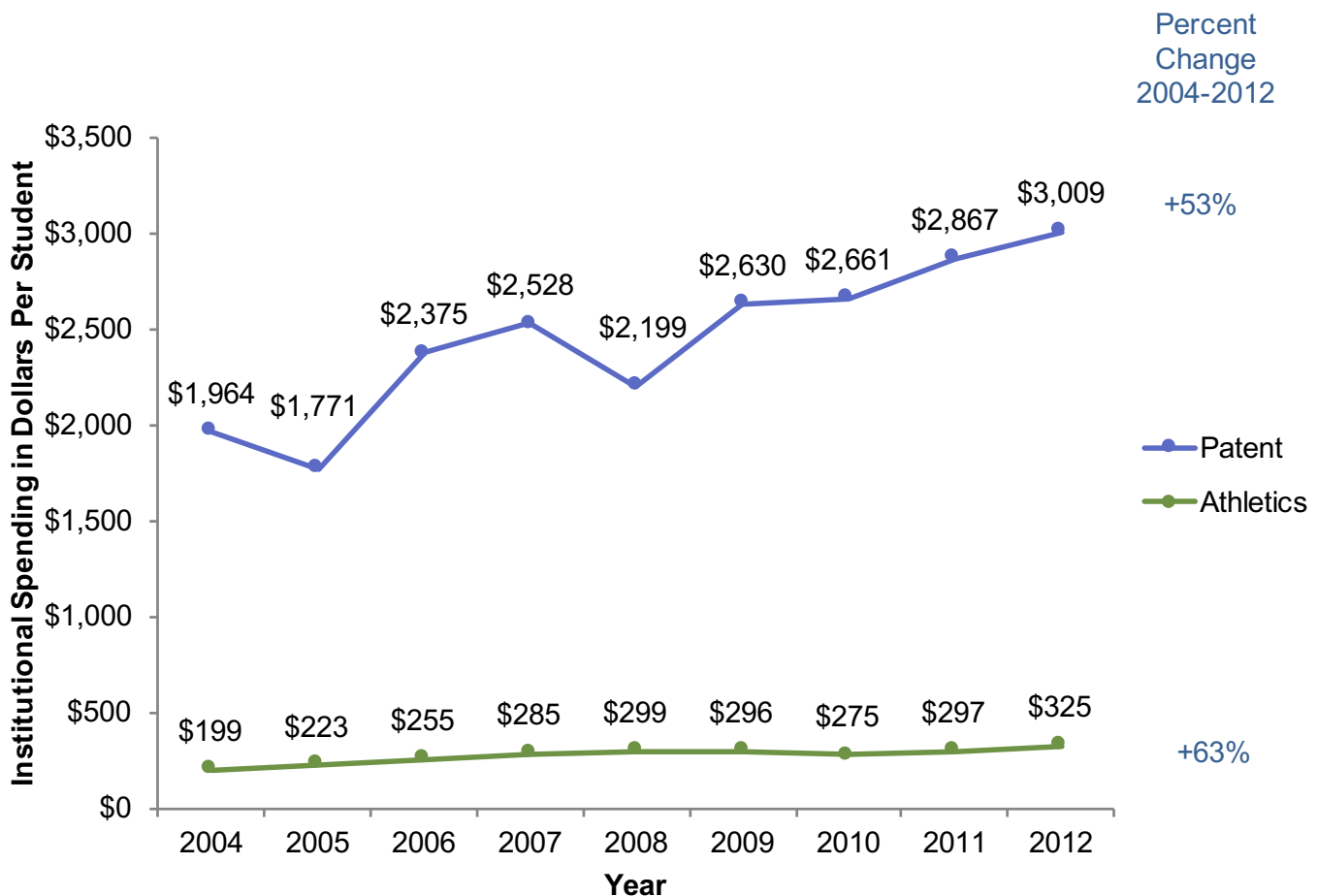
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Conference Structures and Big-Time Subsidy

Through the advances in science, competition for research dollars, and academic reputation, institutions cultivate and garner status. To better understand the institutional investments in commercial activities such as intercollegiate athletics and patents for research, we draw on a conceptual framework of third parties and status systems that illustrates how the athletic and academic missions are integrated in status attainment by conference structures (Sauder, 2006; Lifschitz et al., 2014). We also recognize the intense push for inclusion in a reputation race, where institutions increasingly pursue national and global research university rankings (Portnoi & Bagley, 2015).

Intercollegiate athletics, especially college football conference affiliation, plays a role in perceptions of institutional status (Kelly & Dixon, 2011) and cultivation of status systems among U.S. higher education institutions (Lifschitz et al., 2014). Some schools rely on football history and tradition to cultivate contemporary institutional status. However, for many research institutions with Division I football programs the attainment of academic status through athletic peer-group affiliation is supported by evidence of an

FIGURE 1. Median Institutional Subsidy Per Student in Big-Time Research and Big-Time Sports



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athletic status system built on conference alignment. Lifschitz et al., (2014) found that institutions compete against one another for academic and athletic status in academic prestige through the visibility that big-time football affords. Football and organizational prestige are linked and this linkage is reinforced by the annual gridiron matchups with long histories and structure of college football that athletic conferences provide. The peer institution that a university lines up against on Saturday football afternoons means something. “Schools that view one another as longtime opponents on the athletic field are also close competitors in academic prestige as well” (Lifschitz et al., 2014).

Conference Alignment – How Does Patent Subsidy Compare?

When comparing institutional athletics subsidy and institutional subsidy in patent-eligible research through the lens of athletic status systems, conference alignment and FBS playoff structures are relevant. In college football, institutions organize league competition within conferences.

For the period of this study, the college football post-season and within some Division I policymaking, sub-categories further organize conferences into two distinct groups – the AQ and the non-AQ conferences.

FIGURE 2. Median Institutional Subsidy in Big-Time Research and Big-Time Sports, AQ Conferences

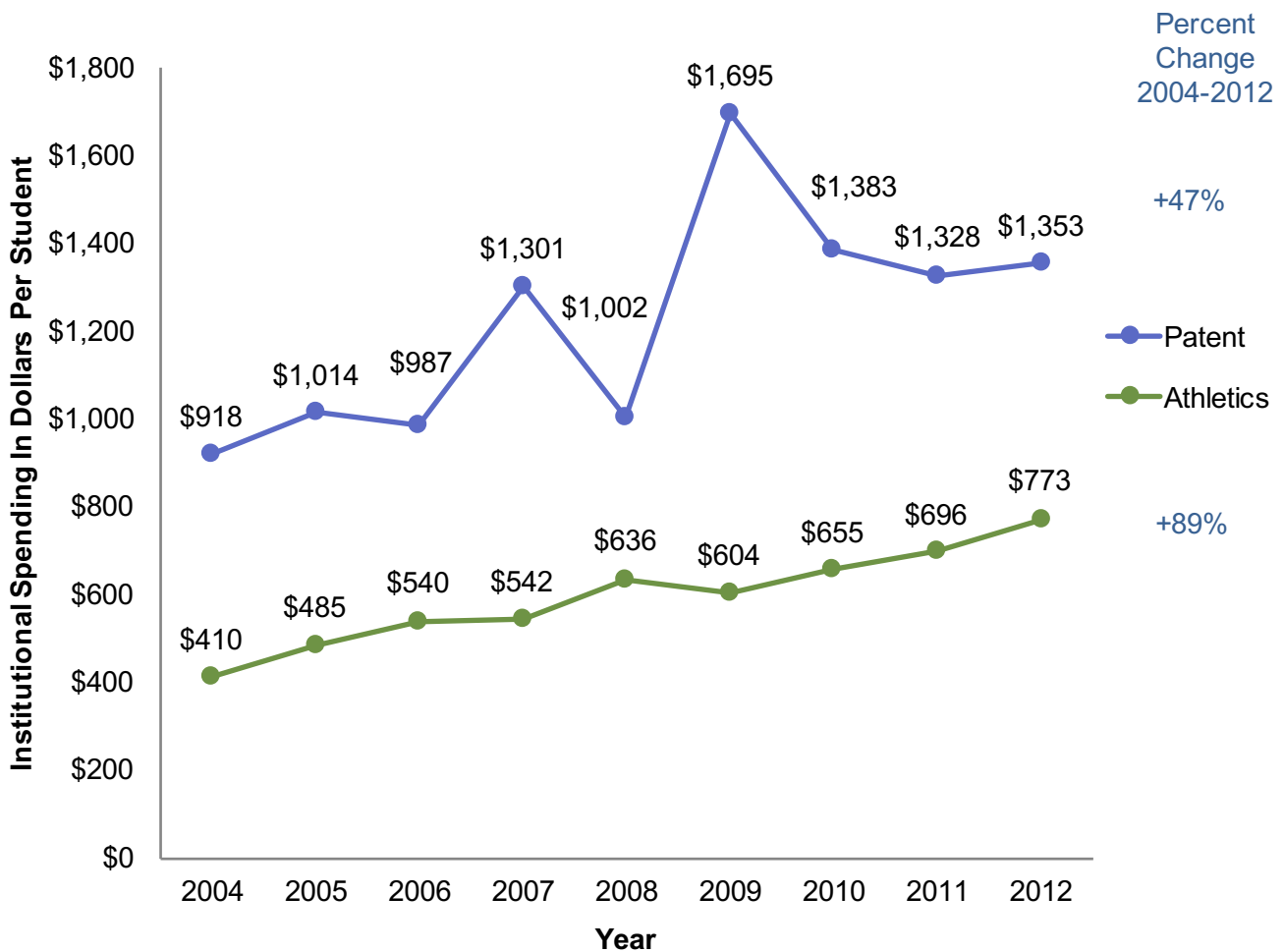


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From 2004-2012 the FBS conferences, consisted of the Atlantic Coast Conference (ACC), Big 12, Big Ten, Pacific 12 (Pac 12), and the Southeastern Conference (SEC). These consisted of the Bowl Championship Series (BCS) Automatic Qualifying (AQ) conferences for college football rankings and post-season selection. Institutions in the other five FBS conferences consist of the non-AQ conferences, which in the reporting period are: Big East (EAST), Conference USA (CUSA), Mid-American Conference (MAC), the Mountain West Conference (MWC), and the Sunbelt Conference (SUN). This report draws on data from 2004-2012 that covers the period when the Western Athletic Conference (WAC) sponsored football and member institutions consisted of non-AQ Conference members. The patent and athletics median institutional subsidy per student is shown by conference in Table 1.

The distinct autonomy structure for policy making in the biggest athletic programs underscores the characteristics related to big-time spending on college sports. As suggested by previous research, the athletic conference structure system also underscores comparative data on big-time research. We find the growth in median institutional subsidy per student for patents among AQ Conferences grew 36% from 2004 to 2012, while median institutional subsidy per student in athletics grew 16% (Figure 2). Among the non-AQ conferences median patent subsidy grew 47% and athletics subsidy grew 89% from 2004 to 2012 (Figure 3).

FIGURE 3. Investments in Big-Time Research and Big-Time Sports, Non-AQ Conferences



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Table 1: Patent and Athletics Median Institutional Subsidy Per Student, By Conference, 2004-2012

Conference	Median Spending Per Student	Year								
		2004	2005	2006	2007	2008	2009	2010	2011	2012
ACC	Median Patent	\$1,680	\$1,962	\$3,390	\$3,988	\$2,515	\$2,561	\$5,937	\$6,034	\$6,043
	Median Athletics	\$219	\$214	\$226	\$242	\$262	\$259	\$271	\$275	\$249
	Ratio	8	9	15	17	10	10	22	22	24
Big Ten	Median Patent	\$4,179	\$4,465	\$4,722	\$4,407	\$4,375	\$4,577	\$5,129	\$6,066	\$6,430
	Median Athletics	\$47	\$83	\$71	\$60	\$33	\$13	\$13	\$5	\$3
	Ratio	89	54	67	73	135	366	395	1,213	2,143
Big12	Median Patent	\$2,742	\$2,591	\$2,729	\$2,591	\$2,822	\$3,006	\$4,685	\$2,908	\$1,939
	Median Athletics	\$135	\$129	\$161	\$161	\$185	\$148	\$149	\$120	\$115
	Ratio	20	20	17	16	15	20	31	24	17
CUSA	Median Patent	\$449	\$736	\$1,055	\$1,092	\$1,406	\$1,308	\$1,071	\$714	\$871
	Median Athletics	\$283	\$409	\$443	\$561	\$668	\$548	\$568	\$637	\$773
	Ratio	2	2	2	2	2	2	2	1	1
EAST	Median Patent	\$2,433	\$2,972	\$4,122	\$3,202	\$466	\$3,024	\$3,279	\$2,536	\$2,508
	Median Athletics	\$544	\$423	\$460	\$450	\$486	\$464	\$512	\$546	\$712
	Ratio	4	7	9	7	1	7	6	5	4
MAC	Median Patent	\$516	\$495	\$199	\$229	\$708	\$424	\$599	\$543	\$1,295
	Median Athletics	\$570	\$579	\$664	\$618	\$713	\$725	\$789	\$798	\$829
	Ratio	1	1	0	0	1	1	1	1	2
MWC	Median Patent	\$2,234	\$2,085	\$2,101	\$2,101	\$2,920	\$2,721	\$2,822	\$2,356	\$2,162
	Median Athletics	\$328	\$300	\$318	\$471	\$500	\$560	\$607	\$638	\$698
	Ratio	7	7	7	4	6	5	5	4	3
Pac 10/12	Median Patent	\$2,796	\$2,749	\$2,943	\$2,796	\$3,213	\$2,840	\$3,005	\$3,108	\$3,681
	Median Athletics	\$196	\$205	\$260	\$193	\$152	\$178	\$185	\$259	\$231
	Ratio	14	13	11	15	21	16	16	12	16
SEC	Median Patent	\$2,381	\$780	\$3,425	\$3,342	\$3,770	\$3,213	\$3,219	\$3,628	\$3,553
	Median Athletics	\$83	\$84	\$144	\$93	\$93	\$96	\$92	\$91	\$93
	Ratio	29	9	24	36	41	33	35	40	38
SUN	Median Patent	\$154	\$106	\$276	\$395	\$430	\$419	\$388	\$355	\$788
	Median Athletics	\$161	\$153	\$404	\$465	\$340	\$507	\$329	\$401	\$874
	Ratio	1	1	1	1	1	1	1	1	1
WAC	Median Patent	\$1,909	\$379	\$649	\$2,021	\$1,440	\$1,863	\$1,512	\$1,828	\$1,764
	Median Athletics	\$104	\$691	\$677	\$713	\$742	\$720	\$751	\$791	\$1,042
	Ratio	18	1	1	3	2	3	2	2	2

Pac 10 2004-2010; Pac 12 2011-2012

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Table 2: Ratio of Patent to Athletics Institutional Subsidy, Per Student, By Conference, BCS Status 2012

FBS & FBS Conference	Year		Ratio 2012
	Median Patent 2012	Median Athletics 2012	
Big Ten	\$6,430	\$3	2143
SEC	\$3,553	\$93	38
AQ	\$4,392	\$152	29
ACC	\$6,043	\$249	24
Big12	\$1,939	\$115	17
Pac 12	\$3,681	\$231	16
FBS	\$3,009	\$325	9
EAST	\$2,508	\$712	4
MWC	\$2,162	\$698	3
Non-AQ	\$1,353	\$773	2
WAC	\$1,764	\$1,042	2
MAC	\$1,295	\$829	2
CUSA	\$871	\$773	1
SUN	\$788	\$874	1

The ratio in spending between patents and athletics subsidy is much greater than the FBS overall in the AQ conference institutions and much lower in the non-AQ conference institutions (Table 2).

Non-AQ conference institutions invest more institutional subsidy in athletics per student than the AQ conferences (Table 2). This is consistent with other reporting on spending in intercollegiate athletics (Desrochers, 2013). The larger patent to athletics institutional subsidy per student ratio found in 2012 in AQ Conferences compared to non-AQ conferences shows that the rate of institutional subsidy for commercialization in patents far outpaces subsidy for athletics among AQ conference members (for a complete list of ratio by FBS, AQ, and non-AQ by year see Table 3, Appendix).

Do Patent and Athletics Subsidies Fulfill Institutional Mission?

Intercollegiate athletics drive the most visible commercial activity within public flagship institutions, while many other commercial activities across the campus go largely unnoticed. Colleges and universities resemble corporations in their treatment of knowledge as a raw material (Slaughter & Rhoades, 2004). Before 1981, the number of patents issued to universities was less than 250 per year. By 1999 this number had risen to 5,545 (Slaughter & Rhoades, 2004). In 2014, according to data compiled by the Association of University Technology Managers (AUTM), there were 5,833 new patents issued and licensing income at colleges and universities totaled \$2.2 billion (AUTM, 2014).

Institutions that generate most of the patent and research activity in higher education are the same institutions seen on Saturday afternoons playing in Division I FBS football games (Clotfelter, 2011). The commodification that big-time college football inserts in higher education has been called the canary in the Hoffman, Rooksby, and Hay

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coalmine – a signal of how institutions manage the competing demands of market interests and institutional mission (Bok, 2003). The rise in academic capitalism within higher education fuels competition and the demand for many aspects of academic status and resources typically associated with big-time college athletics programs.

Varsity athletics are a small part of the university budget, but on many campuses they have a profound impact on campus life, university exposure, and the lives of student-athletes. Although not central to the mission of higher education, intercollegiate athletics is often the window into colleges and universities. The underlying drive for status and prestige that already exists within higher education adds fuel to the intense demand for highly competitive athletic programs. These tensions and others have led to a multitude of ways of reconciling the economic interests of intercollegiate athletics and educational mission on many campuses.

Typically, U.S. higher education institutions embrace three general themes within a social mission of the academy – teaching, research, and public service (Weisbrod, Ballou, & Asch, 2008; Scott, 2006). Yet, the challenges and tensions over institutional mission and the challenges that economic interests introduce into the academy are not limited to intercollegiate athletics. For example, the pursuit of gridiron success that generates athletic revenue relies heavily on leveraging the same institutional characteristics seen in academic capitalism that

drive commercialization within the academy. Similarly, focused pursuit on obtaining and enforcing patent rights requires commitment to articulating and defending the commercial value of science and new knowledge generation, which traditionally have been viewed as core pursuits of the university. Striking the right balance between the allures of the market, and the non-profit ethos and values of institutional mission, is the difficult task for decision-makers confronting commercialization opportunities in both athletics and research.

Although not central to the mission of higher education, intercollegiate athletics is often the window into colleges and universities

Institutional Mission

Among large, public flagship institutions with big-time football programs, the overall mission of the institution is heavily focused on research and generation of new knowledge. “All three components of the higher education social mission have something major in common. Each has been widely judged to be socially – for all of society – valuable and worthy of provision, but each is privately for the individual provider – unprofitable” (Weisbrod et al., 2008, p. 3). That which is publically subsidized to support the social mission of higher education is not intended for profit.

Institutional mission is often believed to be one of public service, and this aspect of the mission is “interlock(ed) with the teaching and research,” in the ways knowledge is transmitted to the community through applied research, consulting and analysis, and service learning (Scott, 2006, p. 24). The mission of higher education at large, state flagship institutions is to generate new knowledge and teach or transmit that knowledge in the classroom or the community, for greater social benefit to all citizens of the state and nation.

Market Interests

The commercial activity at flagship research institutions is characterized as 'entrepreneurial' in that these universities profit from their teaching and research activities (Bok, 2003). This entrepreneurial spirit has included both an increase in the patents and licensing coming from universities and more effort defending patents against infringement. The Bayh-Dole Act of 1980 allowed universities to retain ownership over their faculty's inventions that result from publicly supported research. This policy has been followed by an increase in patent ownership by institutions as well as a widely perceived need to enforce those patents against alleged infringers. Research shows that since 1973, institutions have filed 328 lawsuits involving allegations of patent infringement, and in 2012, institutions of higher education filed 43 patent infringement lawsuits, more than any previous year (Rooksby & Pusser, 2014). Defending these patents brings financial and reputational costs and risks. Legal fees average \$1.6 million in pre-trial costs and rise to an average total of \$2.7 million if the case is brought through trial and appeal. These figures are higher in lawsuits with more than \$25 million at risk (Rooksby & Pusser, 2014).

How were Big-Time Research and Sports Compared?

To compare institutional subsidy for big time commercialization, institutions in the FBS subdivision were organized by BCS conference and by BCS AQ and non-AQ conference status, from the period 2004-2012. We used institutional athletics subsidy (through student fees, institutional transfers, and other forms of institutional support) and institutional patent subsidy (spending in the pursuit, protection, and licensing of patents) per student.

Institutional Commercial Subsidy

Data from the Knight Commission's Athletic & Academic Spending Database for NCAA Division I and the Association of University Technology Managers Statistics Access for Tech Transfer (STATT) database from 2003-2013 was used to develop measures that compare institutional subsidies for intercollegiate athletics and institutional investment in patents among institutions with Division I football programs. Knight Commission Athletic & Academic Spending Database for NCAA Division I data was drawn from: 1) full-time equivalent (FTE) students and 2) total institutional funding for athletics. STATT data was drawn from two measures 1) institutional expenditures on research (excluding federal grants) and 2) unreimbursed legal fees.

Data from the public institutions with FBS football programs in the Knight Commission Database and institutions with FBS football programs reporting STATT data, resulted in an overlap for a total of 77 institutions. Private institutions or institutions that do not distribute direct institutional dollars to athletics were not present in the Knight Commission data. Not all institutions reported STATT data in each year. Therefore, our analysis was based on 77 institutions that hold NCAA Football Bowl Subdivision (FBS) status.

The Knight Commission year was reported as spring for the academic year, which includes the previous fall football season. All institutional years were adjusted to reflect the autumn term and football season (i.e. 2004 reflects the 2004-2005 academic year and 2004 football season) for nine total football seasons from 2004-2012.

These data were entered into the Intercollegiate Athletics Leadership Database, using IPEDS to merge school name, year, enrollment, Knight Commission and STATT financial measures, basic Carnegie status, and conference affiliation. Queries were developed and tested to run reports that merge data based on IPEDS, group data by school and conference on each year, calculate each subsidy measure and Carnegie status. All data was validated to verify the accuracy of the upload procedures.

Data from the queries were imported into Tableau Desktop Professional Edition Version 9.1.2 and median calculated by Tableau to create all visualizations by school, conference, and AQ vs. non-AQ for academic year 2004-05 to 2012-13, for a total of 9 reporting years. Median was calculated only for schools reporting both patent and athletics data.

Big-Time Research and Big-Time Sports Subsidy

The unit of analysis for athletics subsidy was the “Institutional Funding for Athletics per Student” measure calculated from the Athletic & Academic Spending Database. The unit of analysis for research subsidy was a combined measure of research investment, calculated as spending per FTE student. Specifically, we defined institutional subsidy in big-time research as the combination of institutional expenditures on research (excluding federal grants) plus unreimbursed legal fees incurred by institutions in obtaining, licensing, and defending patents.

We used the Knight Commission enrollment figure for enrollment per institution for consistency in calculations. Next we organized by school, conference, and Carnegie status. For a full description of measures and operational definitions, see Glossary in the Appendix.

The measures presented here tell a different part of the academic capitalism story on how institutions invest in commercial opportunities to advance their institutional mission

How Does Big-Time Commercialization Compare?

This report illustrates the market and mission interests with regard to commercial activity in big-time research and big-time sports among institutions that sponsor NCAA Division I Football Subdivision athletic programs. This examination uses investment based on a per student calculation for both patent and athletics investment to allow for a direct comparison of these commercial activities in higher education. These findings raise important questions about the role of commercialization in the context of other institutional mission concerns and market interests. Regardless of the campus sector, these findings illustrate that commercialization is rising in both patent and sport activity across institutions in the sample. There are several important takeaways from these findings:

Patent subsidy is greater than athletics subsidy. Median institutional patent subsidy per student is greater when compared to median intercollegiate athletics subsidy per student among institutions with NCAA FBS athletic programs. Patent subsidy is much greater among the AQ Conferences than the non-AQ conferences. Institutions are contributing much more institutional subsidy to patents per student among institutions with Carnegie Research University-Very High classification and an FBS football program (Figure 4, Appendix).

Athletics are the canary in the coalmine. Commercialization on campus is not just an athletics issue, but college athletics are more visible and garner more attention, underscoring the assertion that intercollegiate athletics are the canary in the coalmine (Bok, 2003). These findings highlight a commercial activity that is not as visible and contributes to the dialogue on the growth of academic capitalism among other institutional interests. Institutions should examine and compare the direct contribution to athletics and patent activity relative to the overall institutional budget to understand if commercial interests are aligning with institutional mission.

Big-time sports spending remain a concern. Evaluating subsidy on commercialization using per student FTE sits in contrast to other reporting on college athletics spending that uses per athlete FTE. Previous reports that illustrate spending on instructional activity use per student data to draw comparisons to athletics using per athlete data and demonstrate an important escalation in institutional costs for athletics (Desrochers, 2013). The measures presented here tell a different part of the academic capitalism story on how institutions invest in commercial opportunities to advance their institutional mission. Although per student subsidy in athletics is less than the per athlete subsidy figures, both revenues and expenses in athletics outpace spending in many other aspects of higher education.

Conference alignment matters beyond the gridiron. FBS conference alignment has implications for institutional priorities that extend beyond the athletic program. The contrast in the gap between big-time research subsidy and big-time sports subsidy between the AQ conferences and the non-AQ conferences raises questions about the peer group that institutions aim to affiliate with when they change conferences. Institutions regularly suggest that changes in athletic conference membership also present opportunities advance research collaborations or academic partnerships with peer institutions (Sweitzer, 2009). Will institutions that aspire to join today's Power 5 or Group of 5 conferences elevate commercial subsidy in athletics only or will they take on other characteristics of commercialization as they pursue new FBS affiliations?

Conclusion

The institutions in this report represent public universities that participate in a segment of college sports which are estimated to generate an additional \$500 million in the new playoff structure, on top of \$2 billion in annual television revenue from college football broadcasts (Branch, 2015). The investment institutions make in college football is more than just the cultivation of campus community and an intense pursuit of commercial gain (Getz & Siegfried, 2012; Lifschitz et al., 2014, Toma, 2003).

Similarly, the drift from public to more market-based funding in academic capitalism cannot be solely explained by declines in public support for basic research (Gregorian, 2006). Examining the trends and comparing measures of academic capitalism through patent and research subsidy and athletic capitalism through institutional athletics subsidy frames the escalation of other investments and trends in the gridiron marketplace (Hoffman, 2012). The findings in this report suggest that athletic commercialism is a symbolic measure of broader institutional commercialism (Bok, 2003). Big-time college sports spending may in fact, as Bok (2003) asserts, be the canary in the coalmine. Findings from this report also illustrate that the evaluation of big-time sports within the broader commercial interests contribute to our understanding of how third-party and status systems such as conference affiliation or FBS subgroup explain the integration of academic and athletic missions in status attainment (Sauder, 2006; Lifschitz et al., 2014). Together these measures of big-time research and big-time sports illustrate the role of commercialism in higher education today.

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Comparing Commercialization in Public Institutions

Appendix

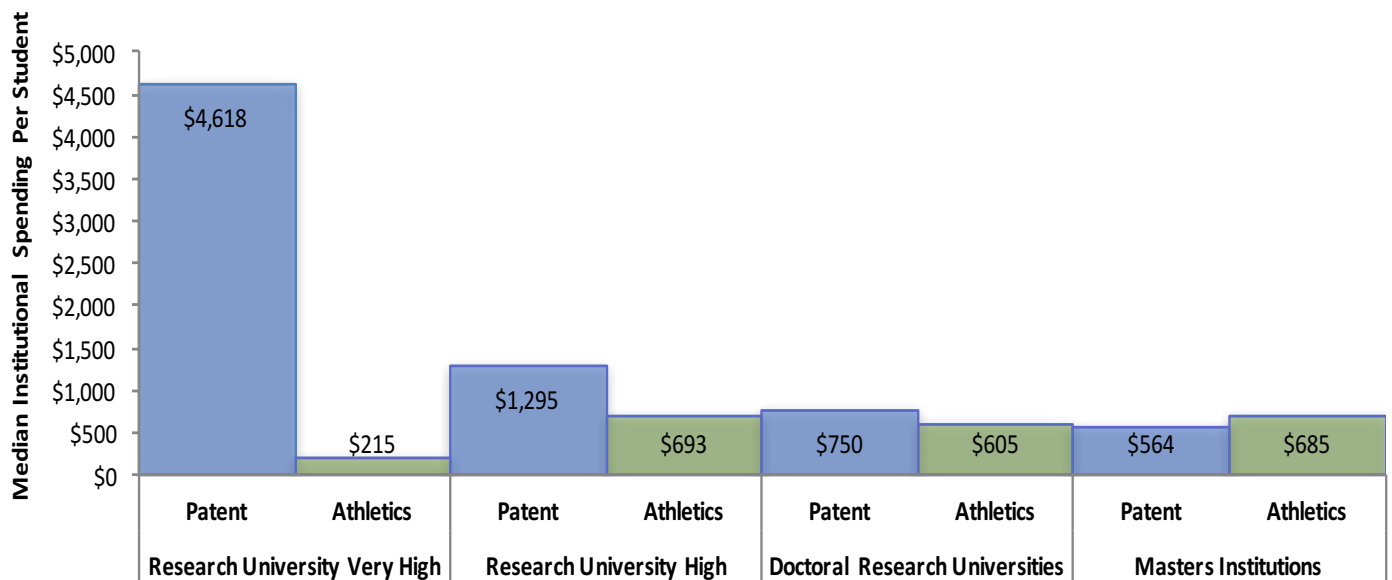
Table 3: Median Patent and Athletics Subsidy Per Student, Gap, & Ratio

	Year									
FBS	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Patent Subsidy	\$1,964	\$1,771	\$2,375	\$2,528	\$2,199	\$2,630	\$2,661	\$2,857	\$3,009	
Athletics Subsidy	\$199	\$223	\$255	\$285	\$299	\$296	\$275	\$297	\$325	
Gap	\$1,765	\$1,548	\$2,120	\$2,243	\$1,900	\$2,334	\$2,386	\$2,561	\$2,684	
Ratio	10	8	9	9	7	9	10	10	9	

	Year									
AQ	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Patent Subsidy	\$3,214	\$3,247	\$4,253	\$3,817	\$3,840	\$3,627	\$3,770	\$4,546	\$4,392	
Athletics Subsidy	\$130	\$138	\$162	\$166	\$169	\$161	\$133	\$118	\$152	
Gap	\$3,084	\$3,109	\$4,091	\$3,652	\$3,672	\$3,466	\$3,637	\$4,428	\$4,240	
Ratio	25	24	26	23	23	23	28	39	29	

	Year									
Non-AQ	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Patent Subsidy	\$918	\$1,014	\$987	\$1,301	\$1,002	\$1,695	\$1,383	\$1,328	\$1,353	
Athletics Subsidy	\$410	\$485	\$540	\$542	\$636	\$604	\$655	\$696	\$773	
Gap	\$508	\$529	\$447	\$759	\$367	\$1,092	\$728	\$632	\$580	
Ratio	2	2	2	2	2	3	2	2	2	

FIGURE 4: Median Subsidy Per Student, By Carnegie Status 2012



Big-Time Research and Big-Time Sports

Table 4: Patent Subsidy and Athletics Subsidy Per Student By Institution, 2004-2012

School Name	Subsidy Per Student	Year								
		2004	2005	2006	2007	2008	2009	2010	2011	2012
Arizona State University	Patent	\$190	\$232	\$1,000	\$1,244	\$1,341	\$1,997	\$2,525	\$2,705	\$4,144
	Athletics	\$246	\$268	\$409	\$210	\$143	\$169	\$167	\$156	\$216
Auburn University	Patent	\$3,269	\$3,247	\$3,604	\$3,922	\$3,770	\$3,702	\$4,161	\$3,046	\$3,553
	Athletics	\$42	\$39	\$218	\$229	\$227	\$222	\$178	\$176	\$181
Ball State University	Patent	\$727	\$781	*	\$235	\$573	*	*	\$396	\$2
	Athletics	\$536	\$545	\$592	\$530	\$778	\$720	\$699	\$696	\$786
Boise State University	Patent	*	*	*	*	\$132	\$249	\$300	\$460	\$564
	Athletics	\$442	\$545	\$611	\$582	\$605	\$658	\$624	\$654	\$685
Bowling Green State University	Patent	\$208	\$219	\$142	\$153	\$6	\$6	\$116	*	*
	Athletics	\$639	\$473	\$575	\$616	\$697	\$688	\$759	\$874	\$875
Clemson University	Patent	*	\$3,930	\$4,402	\$5,254	\$1,653	\$994	\$438	\$182	\$147
	Athletics	\$99	\$202	\$226	\$234	\$250	\$259	\$271	\$275	\$186
Colorado State University	Patent	\$2,836	\$2,565	\$2,637	\$2,815	\$3,064	\$2,952	\$3,067	\$4,092	\$2,995
	Athletics	\$273	\$282	\$320	\$398	\$484	\$533	\$543	\$563	\$723
East Carolina University	Patent	\$124	\$113	\$186	\$177	\$176	\$216	\$282	\$377	\$750
	Athletics	\$410	\$448	\$511	\$511	\$502	\$548	\$531	\$571	\$605
Florida Atlantic University	Patent	~	~	\$276	\$997	*	\$698	*	*	*
	Athletics	~	~	\$540	\$537	\$545	\$510	\$573	\$579	\$672
Florida International University	Patent	~	~	\$294	\$395	\$447	\$419	\$367	\$298	*
	Athletics	~	~	\$404	\$465	\$518	\$507	\$499	\$504	\$518
Florida State University	Patent	\$1,750	\$1,635	\$2,291	\$2,505	\$2,515	\$2,561	\$1,752	\$1,142	\$838
	Athletics	\$134	\$173	\$220	\$222	\$262	\$254	\$258	\$195	\$199
Georgia Institute of Technology	Patent	\$6,343	\$8,405	\$9,714	\$10,073	\$10,408	\$10,347	\$11,356	\$11,614	\$12,499
	Athletics	\$130	\$138	\$162	\$249	\$297	\$311	\$304	\$320	\$322
Indiana University, Bloomington	Patent	\$3,283	\$4,006	\$4,611	\$3,712	\$3,751	\$3,467	\$3,565	\$3,546	*
	Athletics	\$47	\$83	\$51	\$38	\$47	\$58	\$66	\$65	\$63
Iowa State University	Patent	\$4,159	\$4,551	\$4,761	\$4,558	\$4,533	\$4,799	\$4,876	\$4,550	\$4,392
	Athletics	\$155	\$166	\$172	\$170	\$193	\$135	\$139	\$61	\$62
Kansas State University	Patent	\$572	\$789	\$708	\$902	\$1,111	\$1,078	\$982	\$1,498	\$1,939
	Athletics	\$146	\$120	\$150	\$161	\$176	\$159	\$159	\$130	\$115
Kent State University	Patent	\$88	\$143	\$132	\$136	\$859	\$506	\$498	*	*
	Athletics	\$577	\$595	\$664	\$456	\$649	\$680	\$690	\$670	\$771
Louisiana State University	Patent	\$1,492	\$20	\$7,998	\$8,172	\$8,250	\$7,855	\$7,454	\$7,036	\$6,986
	Athletics	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Louisiana Tech University	Patent	*	*	\$1,013	\$1,404	\$1,416	\$1,695	\$1,698	\$1,799	\$1,764
	Athletics	\$465	\$630	\$668	\$901	\$961	\$979	\$1,012	\$1,048	\$1,042
Miami University (Ohio)	Patent	\$304	-\$176	\$811	\$519	\$396	\$342	\$699	\$689	*
	Athletics	\$819	\$831	\$959	\$963	\$1,025	\$980	\$1,032	\$1,132	\$1,099
Michigan State University	Patent	\$4,179	\$4,340	\$4,331	\$4,636	\$4,294	\$4,780	\$1,477	\$5,320	\$5,638
	Athletics	\$77	\$83	\$90	\$84	\$78	\$74	\$80	\$97	\$40
Mississippi State University	Patent	\$6,645	\$6,075	\$6,032	\$6,105	\$6,360	\$6,848	\$6,259	\$6,425	\$6,412

Comparing Commercialization in Public Institutions

School Name	Subsidy Per Student	Year								
		2004	2005	2006	2007	2008	2009	2010	2011	2012
	Athletics	\$271	\$269	\$271	\$296	\$301	\$276	\$262	\$209	\$159
New Mexico State University	Patent	*	\$379	\$20	\$2,341	\$1,463	\$1,265	\$1,326	\$1,462	\$1,353
	Athletics	\$604	\$984	\$686	\$1,183	\$1,159	\$1,133	\$1,244	\$1,306	\$1,357
North Carolina State University	Patent	\$1,384	\$1,475	\$6,198	\$7,023	\$7,064	\$6,140	\$5,937	\$6,034	\$6,349
	Athletics	\$92	\$205	\$120	\$120	\$189	\$200	\$35	\$175	\$213
Northern Illinois University	Patent	*	*	*	*	\$51	\$109	\$28	\$44	\$67
	Athletics	\$508	\$546	\$566	\$729	\$729	\$781	\$829	\$877	\$947
Ohio University	Patent	\$96	\$77	\$199	\$223	\$843	*	*	\$259	\$1,303
	Athletics	\$498	\$562	\$615	\$619	\$639	\$761	\$737	\$780	\$676
Oklahoma State University	Patent	\$2,742	\$2,849	\$4,119	\$4,213	\$5,601	\$5,877	\$4,493	\$4,134	\$3,965
	Athletics	\$199	\$215	\$227	\$232	\$240	\$284	\$278	\$295	\$328
Oregon State University	Patent	\$3,886	\$3,911	\$4,263	\$3,939	\$4,609	\$3,683	\$3,485	\$3,358	\$3,217
	Athletics	\$368	\$1,182	\$792	\$559	\$609	\$537	\$771	\$814	\$509
Pennsylvania State University	Patent	\$4,488	*	*	*	*	\$4,373	\$4,718	\$4,019	\$4,597
	Athletics	\$0	*	*	*	*	\$0	\$0	\$0	\$0
Purdue University	Patent	\$3,790	\$3,978	\$6,105	\$6,208	\$7,008	\$7,411	\$7,478	\$7,710	\$7,439
	Athletics	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Rutgers University	Patent	\$3,932	\$3,985	\$4,436	\$4,391	\$1,083	\$3,190	\$5,114	\$3,976	\$5,137
	Athletics	\$628	\$639	\$618	\$661	\$734	\$727	\$738	\$711	\$1,180
San Diego State University	Patent	*	*	*	\$853	\$2,199	\$2,379	\$2,690	*	\$310
	Athletics	\$406	\$520	\$535	\$544	\$515	\$598	\$670	\$621	\$638
The Ohio State University	Patent	\$3,214	\$6,279	\$4,843	\$4,178	\$4,455	\$4,008	\$3,754	\$5,289	\$6,373
	Athletics	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
University of Akron	Patent	\$1,964	\$2,165	\$1,784	\$1,735	\$1,900	\$2,321	\$2,220	\$2,040	\$2,118
	Athletics	\$562	\$622	\$681	\$696	\$752	\$762	\$819	\$816	\$912
University of Alabama	Patent	*	\$719	\$4	\$265	\$376	\$440	\$617	\$681	\$801
	Athletics	\$129	\$133	\$317	\$391	\$197	\$182	\$184	\$181	\$182
Univ. of Alabama, Birmingham	Patent	\$58	\$3,398	\$3,050	\$6,191	\$7,421	\$9,104	\$8,688	\$7,936	\$8,050
	Athletics	\$600	\$698	\$808	\$831	\$870	\$907	\$1,044	\$1,172	\$1,111
University of Arizona	Patent	\$7,112	\$6344	\$6693	\$8266	\$7489	\$7207	\$7308	\$7572	\$7235
	Athletics	\$146	\$142	\$150	\$175	\$161	\$186	\$203	\$197	\$191
Univ. of Arkansas, Fayetteville	Patent	\$3,588	*	\$4253	\$4241	\$4513	\$3910	\$3785	\$3743	\$3745
	Athletics	\$94	\$105	\$104	\$91	\$86	\$94	\$93	\$91	\$89
University of Central Florida	Patent	\$1,629	\$1,359	\$1,123	\$881	\$1,002	\$703	\$703	\$714	\$871
	Athletics	\$371	\$369	\$374	\$439	\$409	\$431	\$439	\$435	\$441
University of Cincinnati	Patent	\$756	\$838	\$620	\$2,959	\$2,876	\$2,857	\$2,631	\$2,536	\$2,508
	Athletics	\$247	\$236	\$417	\$415	\$484	\$474	\$496	\$546	\$712
University of Colorado, Boulder	Patent	\$16	\$11	\$15	-\$14	\$29	\$14	\$6,017	\$5,494	\$5,924
	Athletics	\$108	\$391	\$221	\$274	\$249	\$244	\$523	\$539	\$245
University of Connecticut	Patent	\$934	\$1,014	\$453	\$1,268	\$466	\$392	\$304	\$1,125	\$1,075
	Athletics	\$460	\$468	\$460	\$512	\$608	\$618	\$639	\$722	\$802

Big-Time Research and Big-Time Sports

School Name	Subsidy Per Student	Year								
		2004	2005	2006	2007	2008	2009	2010	2011	2012
University of Florida	Patent	\$49	\$23	\$2,660	\$2,746	\$2,831	\$3,213	\$3,219	\$3,145	\$2,813
	Athletics	\$73	\$75	\$79	\$81	\$80	\$91	\$91	\$90	\$93
University of Georgia	Patent	\$6,195	\$6,944	\$6,842	\$7,369	\$7,116	\$3,030	\$2,806	\$6,028	\$6,179
	Athletics	\$93	\$92	\$92	\$93	\$93	\$96	\$92	\$92	\$93
University of Hawaii, Manoa	Patent	\$1,909	\$2,193	\$2,711	\$2,021	\$2,691	\$2,031	\$500	\$1,948	\$2,037
	Athletics	\$104	\$485	\$502	\$590	\$632	\$609	\$698	\$788	\$848
University of Houston	Patent	\$142	\$7	\$987	\$1,303	\$1,809	\$1,913	\$1,439	\$1,574	\$1,796
	Athletics	\$221	\$201	\$230	\$611	\$668	\$546	\$605	\$637	\$773
University of Idaho	Patent	*	*	*	\$2,551	\$3,576	\$2,933	\$2,988	\$2,593	\$3,134
	Athletics	\$611	\$669	\$744	\$705	\$751	\$729	\$803	\$791	\$857
University of Iowa	Patent	\$3,764	\$4,119	\$4,569	\$2,082	\$2,370	\$5,683	\$5,540	\$6,066	\$5,904
	Athletics	\$133	\$123	\$112	\$82	\$18	\$20	\$21	\$20	\$24
University of Kansas	Patent	\$806	\$885	\$858	\$936	\$997	\$1,212	\$2,249	\$1,681	\$1,601
	Athletics	\$135	\$129	\$161	\$154	\$151	\$137	\$127	\$110	\$114
University of Kentucky	Patent	\$960	\$841	\$1,038	\$3,342	\$3,910	\$55	\$2,355	\$2,337	\$3,022
	Athletics	\$28	\$25	\$22	\$25	\$29	\$30	\$32	\$31	\$32
University of Louisville	Patent	\$3,898	\$3,946	\$4,509	\$4,782	\$56	\$4,765	\$4,984	*	\$51
	Athletics	\$278	\$423	\$465	\$484	\$486	\$453	\$527	\$551	\$599
University of Maryland, College Park	Patent	\$2,346	\$2,288	\$2,378	\$2,721	*	*	*	*	*
	Athletics	\$243	\$317	\$329	\$348	\$524	\$417	\$476	\$479	\$423
University of Massachusetts, Amherst	Patent	~	~	~	~	~	~	~	~	\$7,430
	Athletics	~	~	~	~	~	~	~	~	\$871
University of Memphis	Patent	*	*	*	*	*	*	*	\$579	\$866
	Athletics	\$268	\$307	\$335	\$611	\$676	\$656	\$832	\$1,021	\$1,056
University of Michigan	Patent	\$4,478	\$4,590	\$4,833	\$5,966	\$6,974	\$7,153	\$7,611	\$8,859	\$9,787
	Athletics	\$0	\$0	\$1	\$1	\$0	\$5	\$5	\$5	\$5
University of Minnesota, Twin Cities	Patent	\$4,573	\$5,524	\$2,768	\$3,030	\$3,263	\$3,571	\$7,114	\$7,588	\$6,487
	Athletics	\$202	\$194	\$211	\$207	\$177	\$163	\$159	\$160	\$149
University of Mississippi	Patent	\$661	\$702	\$776	\$765	\$700	\$671	\$998	\$1,348	\$1,129
	Athletics	\$176	\$174	\$183	\$228	\$224	\$218	\$211	\$118	\$205
University of Nebraska, Lincoln	Patent	\$9,098	\$9,213	\$10,312	\$9,526	\$10,271	\$6,410	\$7,511	\$8,880	\$9,403
	Athletics	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
University of Nevada	Patent	*	\$234	\$284	\$567	\$554	\$2,656	\$2,108	\$1,828	\$2,286
	Athletics	*	\$691	\$726	\$713	\$733	\$710	\$688	\$587	\$710
University of Nevada, Las Vegas	Patent	\$1,975	\$1,880	\$1,830	*	*	*	*	*	*
	Athletics	\$410	\$731	\$702	\$790	\$655	\$1,382	\$1,316	\$1,326	\$1,507
University of New Mexico	Patent	\$2,120	\$2,289	\$2,371	\$2,649	\$2,934	\$2,630	\$2,324	\$2,356	\$2,393
	Athletics	\$382	\$318	\$315	\$563	\$627	\$586	\$684	\$737	\$624

Comparing Commercialization in Public Institutions

School Name	Subsidy Per Student	Year								
		2004	2005	2006	2007	2008	2009	2010	2011	2012
University of North Carolina, Chapel Hill	Patent	\$1,680	\$5,177	\$5,442	\$5,854	\$6,499	\$5,693	\$6,268	\$6,119	\$3,689
	Athletics	\$219	\$322	\$331	\$307	\$316	\$308	\$305	\$321	\$313
University of North Texas	Patent	\$154	\$106	\$188	\$363	\$412	\$387	\$409	\$412	\$431
	Athletics	\$161	\$153	\$152	\$157	\$162	\$162	\$158	\$298	\$555
University of Oregon	Patent	\$616	\$621	\$729	\$672	\$773	\$716	\$742	\$698	\$16
	Athletics	\$67	\$70	\$0	\$59	\$65	\$121	\$104	\$102	\$97
University of South Alabama	Patent	~	~	~	~	~	~	~	~	\$1,144
	Athletics	~	~	~	~	~	~	~	~	\$1,193
University of South Carolina, Columbia	Patent	\$5	\$240	*	\$1,388	\$1,210	\$15	\$303	\$3,628	\$3,452
	Athletics	\$36	\$35	\$48	\$79	\$80	\$80	\$75	\$76	\$81
University of South Florida	Patent	\$2,909	\$2,972	\$4,122	\$3,445	*	\$3,868	\$3,926	\$5,234	\$5,944
	Athletics	\$287	\$303	\$318	\$322	\$405	\$413	\$472	\$462	\$489
University of Tennessee, Knoxville	Patent	\$3,376	\$3,285	\$3,245	\$3,300	\$3,265	\$3,355	\$3,502	\$4,546	\$4,639
	Athletics	\$288	\$223	\$253	\$437	\$405	\$446	\$31	\$35	\$437
University of Texas, Austin	Patent	\$3,049	\$2,591	\$2,729	\$2,591	*	*	*	*	*
	Athletics	\$63	\$36	\$40	\$40	\$0	\$0	\$0	\$0	\$0
University of Toledo	Patent	\$902	\$1,615	\$1,060	\$1,299	\$1,664	\$1,275	\$1,150	\$1,194	\$1,286
	Athletics	\$595	\$554	\$614	\$540	\$523	\$436	\$446	\$551	\$563
University of Utah	Patent	\$2,347	\$1,662	\$1,454	\$1,553	\$2,906	\$2,812	\$2,954	\$2,857	\$2,843
	Athletics	\$224	\$242	\$256	\$274	\$301	\$319	\$332	\$347	\$348
University of Virginia	Patent	\$1,318	\$1,323	\$1,191	\$1,349	\$1,476	\$939	\$1,918	\$5,360	\$6,043
	Athletics	\$348	\$397	\$413	\$459	\$487	\$495	\$524	\$544	\$547
University of Washington	Patent	\$7,471	\$6,879	\$6,993	\$8,334	\$8,000	\$4,405	\$4,211	\$4,751	\$5,554
	Athletics	\$39	\$43	\$43	\$46	\$46	\$50	\$55	\$67	\$73
University of Wisconsin, Madison	Patent	\$8,804	\$9,223	\$12,158	\$11,198	\$13,909	*	*	*	*
	Athletics	\$155	\$162	\$170	\$143	\$145	\$148	\$193	\$191	\$208
Virginia Polytechnic Institute & State University	Patent	\$1,011	\$944	\$1,199	\$1,469	\$1,118	\$1,033	\$7,480	\$7,839	\$8,499
	Athletics	\$224	\$223	\$226	\$218	\$219	\$221	\$240	\$244	\$249
Washington State University	Patent	\$1,706	\$1,586	\$1,623	\$1,652	\$1,816	\$857	\$1,425	\$1,683	\$1,198
	Athletics	\$374	\$369	\$370	\$392	\$415	\$393	\$439	\$321	\$245
West Virginia University	Patent	*	*	*	\$1,563	\$2	\$526	\$540	\$1,060	\$1,628
	Athletics	\$106	\$116	\$129	\$132	\$146	\$147	\$148	\$152	\$152
Western Michigan University	Patent	*	\$771	\$2	\$2	*	*	*	*	*
	Athletics	\$596	\$626	\$672	\$710	\$741	\$777	\$851	\$921	\$1,018

* Not reported

~ Not an FBS member

Big-Time Research and Big-Time Sports

Glossary

Big-Time Sports. The institutional athletics subsidy through student fees, institutional transfers, and other forms of institutional support among institutions with Division I FBS football programs.

Data for median measures of institutional subsidy per student on big-time sports were drawn from the Knight Commission Athletic & Academic Spending Database for NCAA Division I. We use the Knight Commission's database figure for full-time equivalent (FTE) students for each year to determine the investment per student. This FTE figure is the full- and part-time undergraduate and graduate (including first professional students). We then used the Knight Commission's database figure 'Total Institutional Funding for Athletics' per school for each year and calculate the institutional investment per student FTE for each institution.

Median Athletics Subsidy. Total institutional funding for athletics divided by student enrollment as reported by the Knight Commission Athletic & Academic Spending Database for NCAA Division I.

Calculating the investment in the athletic department using per student FTE differs from other spending calculations that compare athletics spending per athlete to instructional spending per student. We view the commercial investment in the athletic department in the context of other campus commercial activity and used the per student FTE to draw the comparison.

Big-Time Research. The institutional patent subsidy based on institutional expenditures on research (excluding federal grants), plus unreimbursed legal fees among institutions with Division I FBS football programs.

The institutional patent subsidy through spending in the pursuit, protection, and licensing of patents were drawn from the Association of University Technology Managers Statistics Access for Tech Transfer (STATT) database. We used the Knight Commission's figure for full-time equivalent (FTE) students for each year to determine the investment per student. This FTE figure is the full- and part-time undergraduate and graduate (including first professional students). We then used the STATT figures for institutional investment for research (foundation, institutional, state research expenditures, and unreimbursed legal fees combined) per school for each year to calculate the institutional investment per student FTE by institution.

Median Patent Subsidy. Total institutional funding for patent subsidy divided by student enrollment as reported by the Knight Commission Athletic & Academic Spending Database For NCAA Division I. Institutional patent subsidy is based on institutional expenditures on research (excluding federal grants), plus unreimbursed legal fees.

Year. The year designation represents fall of the academic year to focus on the fall football season for each designated year. For both the Knight Commission data and the fiscal year for STATT we adjust year to align with a common year designation to represent the fall football season (e.g., "2010" is the "2010-2011" academic and fiscal year).

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