Athletics in the academic marketplace: Using revenue theory of cost to compare
trends in athletic coaching salaries and instructional salaries and tuition

by

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Abstract

This study reviewed publicly available institutional financial and participation reports at the highest level of athletic competition, National Collegiate Athletic Association (NCAA) Division I. Institutions were grouped by NCAA subdivision status, athletic conference, flagship status, football Bowl Championship Series automatic qualifying status, and several athletic expenses categories. Growth rates between 2005 and 2011 were compared in instructional salaries, tuition rates, athletic coaching salaries, and costs of instruction. Revenue theory of cost and resource dependency theory related these costs within the context of institutional identity to explicate the marketplace of athletics compared to academics in higher education. Descriptive statistics, correlations, ANOVAs, and visual representations were used to analyze the data. The study found the growth rate of total athletic coaching salaries and football coaching salaries far exceeded the corresponding growth rate for instructional salaries and tuition rates at a significant level in all groupings of institutions with major college sports programs.

The purpose of this study is to provide a more complete understanding of the place of intercollegiate athletics in American higher education by comparing the growth of athletic coaching salaries to that of tuition costs and instructional salaries at public institutions with athletic programs competing in Division I of the National Collegiate Athletic Association (NCAA). This study is particularly significant in the current era. As state and federal funding erode and as college spending is more closely scrutinized, this research provides a new context to understand the current marketplace of athletics as compared to academics in America's system of higher education.

This study examines theories relating the costs of higher education tuition and instructional salaries to the costs of intercollegiate athletics coaching salaries. The revenue theory of cost and resource dependency theory relate these concepts within the context of institutional identity. This framework shapes a research question to investigate the relationship between these costs at an institutional level. Subsequently, the process of data collection and analysis are shared, with a conclusion about the potential implications of the findings.

Introduction

The cost of higher education has taken center stage in public discourse about the future of America. The costs of higher education have not decreased despite the most recent economic recession, leading to concerns about the well-being of higher education that enrollment has reached a peak (Marcus, 2012). The increasing costs are making it more difficult for a greater number and greater diversity of people to choose a college, or even to attend college. A 2012 national public opinion poll found that the number of adults who think college is a good investment dropped to 57 percent, down from 81 percent in 2008 (Klingkade, 2012). Despite the

trends, scholars, legislators, financial advisors, and even a significant majority of the public (Rotherham, 2011) understand that higher education is necessary for improved quality of life and the future prosperity of the nation (Wieckowski, 2012).

One of the most easily understood, and most widely-used, measures of the costs of higher education is the annual cost of tuition for an individual to attend a four-year institution on a full-time basis. Since 2004, the cost for tuition to attend public four-year institutions full-time has increased more than 31 percent in current dollars, or more than 16 percent in real dollars (U.S. DOE, 2012). In recent years, tuition has increased three times faster than the nation's median family income (Komolafe, 2012).

A significant internal cost for higher education is the cost of instruction, particularly compensation and salaries for faculty. While compensation and salary for faculty are substantial from the standpoint of public interest (Bowen 1980; Ehrenberg, 2000), this study will focus only on faculty salaries. Ehrenburg (2000) discussed the competitive nature of setting salaries to attract talented faculty. The debate necessitates consideration of a variety of factors, including professional and nonprofessional programs; private and public institutional status; professoriate experience; and, cost of living adjustments. Institutions "compete most strenuously to attract new faculty and retain new faculty, and to do so it must 'meet the market'" (Ehrenburg, 2000, p. 123). Since 2004, the costs at public four-year institutions to support the salaries of full-time professors rose 15.3 percent, or 2.0 percent in constant dollars (U.S. DOE, 2011).

As financial costs of learning and teaching continue to rise, the competitive marketplace of American higher education is one in which institutions solicit funds to pay for offerings that differentiate their school from other schools. During the most recent recessionary period, institutions carved out their own institutional identity by investing in many areas, such as unique

curricular offerings (Giegerich, 2012; JBHE, 2012), professional programs (Young, 2012), integrating learning with community needs (University of Michigan-Dearborn, 2012), building extravagant campus room and dining opportunities (Oregon State University, 2012), and elaborate recreational opportunities (University of Iowa, 2010). Additionally, intercollegiate athletics may be the most publicly recognized area in which financial investments are intended to enhance an institution's identity (Shulman & Bowen, 2000; Toma, 2003).

The prominence of coaching salaries, and their comparable nature to the role of faculty, make it apt to compare the competitive marketplace of coaching salaries to the marketplace of instructional salaries. This is especially true because, regardless of the national economic climate or the fiscal well-being of an institution, institutions are reported to spend increasingly more of their strapped financial resources on the salaries of coaches to make these programs as competitive as possible, with the expectation that such investment will increase exposure and institutional notoriety (Knight Commission, 2010; Knight Commission, 2009). There is wide media attention that these salaries, particularly for head football coaches, have grown astronomically in the past decade (Berkowitz, 2012; Brady, Upton, & Berkowitz, 2011; Clark, 2012; Grasgreen, 2012). However, the growth in coaches salaries now extends beyond football into other many other sports that are not traditionally revenue-producers (Brackin, 2012). According to data obtained for this study from the USA Today, salaries for athletic coaches at the nation's most athletically competitive level, NCAA Division I-FBS, have increased by 67.1 percent since the 2004-2005 academic year. At the next tier of competition, NCAA Division I-FCS, coaches' salaries increased by 59.4 percent.

While the excesses of coaching salaries has been well aired in the media, this study helps to place these salaries in the context of other costs that are more directly aligned with the

academic mission of higher education. Further, a look at each institution in the nation's most competitive athletic levels can provide a greater understanding of the extent that athletics may be considered a priority in the context of the academic missions. Thus, it is a useful perspective to compare how much students are asked to pay for an education at times of economic stress, and how much institutions are willing in these times to pay instructors involved in helping students learn in the classroom, to how much institutions are willing to pay individuals involved in providing athletics as a major institutional activity that may or may not be related to college athletes' educational welfare.

Conceptual Framework

The framework for this study is couched in several concepts to provide a lens for understanding how the costs of athletics can be viewed in comparison to the costs for instructional salaries and tuition. The revenue theory of cost and resource dependency theory help to explain how college leaders spend money based upon institutional needs to maximize revenue, and to explain that colleges are dependent on those who maximize those revenues. This proposal also provides an understanding of the impact of organizational culture in setting policy, and shows that symbolism and institutional identity are a significant impact in how college leaders set fiscal policy.

Bowen (1980) summed up the revenue theory of cost as a short-run theory for higher education which explains, on a year-to-year basis, that the cost of higher education is "determined by the revenue available for education that can be raised per student unit" (p. 18). He qualified this by explaining that control over decisions that impact the flow of revenues is diffused to those who are able to influence how revenues can be maximized. In the long-term,

"the amount of revenue… will be influenced by… changes in the competitive conditions within the higher education community" (Bowen, 1980, p. 19).

Resource dependency theory is also a way to understand financial decisions in higher education. The theory suggests that parts of an institution closer to the marketplace are able to command greater internal resources (Suggs, 2009). This is particularly poignant to intercollegiate athletics. Athletics at many of the most competitive campuses generate significant revenues from media contracts and donors (Gilde, 2007; Knight Commission, 2009), and also generate a significant amount of publicity (Duderstadt, 2003; Toma, 2003). In *College Sports 101*, the Knight Commission noted that 17 percent of external sources of athletic department revenue came from media contracts and revenue generated from football or basketball teams playing in postseason games (Knight Commission, 2009). This latter amount has increased significantly in recent years, with a minimum of $13 billion in lifetime media contracts guaranteed to five of the most competitive athletic conferences (Knight Commission, 2011). However, scholars and the media debate as to how much of this amount of money is actually necessary to administer all of the teams of an institution's athletic program and provide a reasonable quality of life for college athletes. Resource dependency theory would suggest a significant amount of the money raised in the marketplace from these media contracts goes back into athletics in the form of coaches' salaries because coaches are defined as individuals with access to external resource providers (Pfeffer & Salancik, 1978). Coaching salaries have increased substantially to comprise the largest expense of athletics programs, on average 32 percent of the budget at the most competitive athletics programs (Knight Commission, 2009).

In addition, it is important to consider that higher education organizations typically have strong institutional cultures, in which individuals view the school based on historic and symbolic

forms. It is this culture which influences financial decisions (Hirko, 2011; Tierney, 1991).

Athletics have become an increasingly important symbol of institutional pride and identity, and

financial decisions made by college leaders help to support and enhance this identity

(Duderstadt, 2003; Grasgreen, 2012; Toma, 2003). As coaches help to make their athletics

programs successful, and enhance an institution's identity on a national stage, they are paid a

higher market price. Coaching salaries reflect "other factors" as suggested by Bowen (1980) that

impact the marketplace and lead to legislative appropriations and students' and families'

willingness to pay tuitions (Duderstadt, 2003; Gilde, 2007; Knight Commission, 2009).

By investigating the increase in coaching salaries and comparing it to instructional

salaries and tuition rates, this study hopes to provide a useful way to understand the extent to

which the cost of investing in athletics is tied to the marketplace.

Research Question

Thus, the direction of this study is to consider the extent that intercollegiate athletics is

more closely tied to the marketplace than academics. The financial situation of institutions was

used as a context to frame the research question for the analysis of the study:

To what extent are the costs of intercollegiate athletic coaching salaries tied to the

academic marketplace?

Methods

Data Categorization

Institutions were categorized (Table 1) for the purposes of responding to the research question of whether or not certain affiliations of institutions will spend more money for athletic coaching salaries than on instructional salaries or tuition, despite their financial situation. Level of competition (NCAA Subdivision) and athletics conference membership were among the categories used to group institutions. The most recent conference affiliation was used to conduct data analysis of each institution for each year of the data analysis (2004-2005 through 2010-2011 academic years). While many institutions moved from one athletics conference to another since 2012, only a few institutions (University of Nebraska, West Virginia University, Boise State University) switched conferences during the years of focus of investigation for this study. Because this study was interested in and looking at within-group comparisons, it was deemed necessary to use the most recent affiliation as the grouping most consistent for our analysis. This same logic was applied to Western Kentucky University, which shifted subdivision status from FBS to FCS in 2009.

In addition, athletics expense data of each institution was used to group institutions by size of athletics programs. If institutions were a member of the most competitive level, Division I-FBS Bowl Championship Series (BCS) automatic qualifying (AQ) institutions, they were then split into halves by size of athletics expense budget, as well as by thirds. Membership in a BCS AQ conference is important with respect to the rise of spending in college athletics, because those institutions typically have the largest football stadiums, alumni base, and media exposure due to their affiliation with the lucrative BCS. Therefore, BCS halves and thirds were used as

categorical groupings to respond to the research question. A complete list of institutional

membership in each category is available in Appendix A.

Table 1.

List of categories for institutions

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NCAA Division I-Football Bowl Subdivision (FBS)
NCAA Division I-Football Championship Subdivision (FCS)
Bowl Championship Series automatic qualifying conference (BCS AQ)
Bowl Championship Series non-automatic qualifying conference (BCS non-AQ)
BCS institutions in top half of athletics expenses (BCS top half)
BCS institutions in bottom half of athletics expenses (BCS bottom half)
BCS institutions in top third of athletics expenses (BCS top third)
BCS institutions in bottom two-thirds of athletics expenses (BCS bottom thirds)
Flagship institution
Non-flagship institution
Athletic Conference:
        America East
        Atlantic Coast (ACC)
        Atlantic Ten
        Big East
        Big Sky
        Big South
        Big Ten
        Big Twelve
        Colonial Athletic
        Conference USA
        Great West
        Horizon League
        Mid-American (MAC)
        Mid-Eastern Athletic (MEAC)
        Missouri Valley
        Mountain West
        Northeast
        Ohio Valley
        Pacific Ten
        Southeastern
        Southern
        Southland
        Southwestern Athletic (SWAC)
        Summit League
        Sun Belt
        Western Athletic
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Data Sources

Data were collected from publicly available financial and participation documents

provided under license from *USA Today*. The 2004-2005 to 2010-2011 academic years were

used as this period included the most recently available NCAA financial reports.

To determine financial situation, growth rates in institutional budgets will be considered, specifically cost of instruction expenses available from the U.S. Department of Education Integrated Postsecondary Education Data System (IPEDS) database (http://nces.ed.gov/ipeds/). Cost of instruction was used as the variable for financial situation because of the availability of data from IPEDS through 2011. IPEDS cost of instruction includes the "sum of all operating expenses associated with the colleges, schools, departments, and other instructional divisions of the institution and for departmental research and public service" (IPEDS, 2013). Several significant national studies have investigated cost of instruction and concluded its close tie to institutional mission, range of program offerings, commitment to graduate education, and priority given to research and public service (Hellenbrand, Horn, Shubin, & Stinner, 2012; Middaugh, Graham, & Shadid, 2003; Radcliffe, 2012). In other words, cost of instruction is an easily available measure of the university's investment in its core mission and academic programs.

Instructional salaries and tuition rates used for this study were also available from IPEDS database for the 2005-2011 time period. Instructional salaries were defined as the average salary equated to nine-month contracts of full-time instructional faculty from all ranks (professors, associate professors, assistant professors, instructors, lecturers, and no academic rank). Tuition rates were defined as in-state average tuition charges for full-time undergraduates (IPEDS, 2013).

Total athletics coaching salaries and football coaching salaries for each public NCAA Division I institution from 2005-2011 are reported on NCAA Financial Report forms, and were available by agreement with USA Today. USA Today retrieved this data through Freedom of Information Act (FOIA) requests of athletics departments at nearly each NCAA Division I public

institution, for each year of this study. NCAA financial reports are not available from private institutions, which are exempt from state Freedom of Information Act laws; thus, this study will only focus on public institutions. Several institutions were excluded from this study, notably the military academies (U.S. Military Academy, U.S. Air Force Academy, U.S. Naval Academy) as well as public institutions from the state of Pennsylvania (University of Pittsburgh, Pennsylvania State University) which are immune from FOIA requests as a matter of state law. Further, in order to obtain the data from USA Today, it was agreed to present findings by categorical grouping and not by institution.

Total athletics coaching salaries used for this study were defined as gross salaries, bonuses and benefits provided to all head and assistant coaches, which includes all gross wages, benefits and bonuses attributable to coaching that would be reported to the IRS by university and related entities (e.g. foundations or booster clubs). Total football coaching salaries were a subset of total athletics coaching salaries expenses, but directly related to the football team.

Total athletics expenses used for this study were defined as costs paid by an institution's athletics program for: athletic student aid (scholarships); athletic contest guarantees, coaching salaries, benefits, and bonuses paid by the university and related entities; coaching other compensation and benefits paid by a third party; support staff/administrative salaries, benefits, and bonuses paid by the university and related entities; support staff/administrative other compensation and benefits paid by a third party; severance payments; recruiting; team travel; equipment, uniforms and supplies; game expenses; fundraising, marketing and promotion; sports camp expenses; direct facilities, maintenance, and rental; spirit groups; indirect facilities and administrative support; medical expenses and medical insurance; memberships and dues; other operating expenses.

Values used were nominal dollar values, not corrected for inflation. No process has yet been used to develop an inflation correction formula for college sports; college athletics departments consume a different market basket of goods than colleges as a whole, so measures such as HEPI are inappropriate; and because consumers are also different, the CPI is also questionable.

Data Analyses

The research question was tested by creating and comparing growth rates of each of the variables by category, as well as through more rigorous statistical analysis. Each process is explained below.

Upon receipt of data, a review of missing data from USA Today and IPEDS revealed 66 instances of missing data from 4,820 data points, or 1.3 percent of missing data from seven years of data, 2005-2011, for the 172 institutions, and for the variables: instructional salaries, tuition rates, total coaches salaries, football coaches salaries, and cost of instruction. Imputation was used to supplant the missing data, using average annual growth rates in each of the athletic conferences by year as a proxy for growth rates (Donders, van der Heijden, Stijnen, & Moons, 2006).

After completing the data set, growth rates for each of the variables were calculated, looking at the difference in spending in each of the variables between 2005 and 2011. The differences between these years for each of the variables were grouped by athletic conference, subdivision status, BCS AQ status, BCS halves and thirds, and flagship status.

Pearson correlation within each of the categories was used to determine if there was a relationship between the variables. The strongest and most statistically significant relationships provided insight as to whether or not total athletic coaching salaries or football coaching salaries had any relation to cost of instruction, instructional salaries, or tuition rates.

Analysis of variance (ANOVA) is a measure of whether a category has an effect on a particular variable. Therefore, ANOVAs were conducted of the categorical variables on the dependent variables of interest, i.e. the growth rates of the various salary and expense categories. Findings from ANOVA were expected to help respond to the research question by category.

Bar graphs were also used as a visual comparison of the growth rates of each of the variables as grouped by categories. In other words, these graphs helped provide another way to compare average growth rates in total coaching salaries and football coaching salaries with respect to average growth rates in instructional salaries, tuition rates, and the financial situation (average growth in or cost of instruction) of institutions.

Finally, t-tests were conducted on growth rates of instructional salaries and football coaching salaries to determine if there was any chance that they could be random draws from the same sample.

Results

Growth rates (Table 2) showed that growth has varied widely in most fields, but growth in total athletic coaching salaries (FBS = 67.1%, FCS =59.4%) and football coaching salaries (FBS=80.8%, FCS=61.9%) surpass growth in instructional salaries (FBS=15.8%, FCS=14.1%) between 2005 and 2011. The ratio of the growth in spending on football coaching and institutional salaries to the growth of cost of instruction (aka financial situation) is another

demonstration of the data (Figure 5). The Summit League is an outlier in this figure, with the

highest growth in football coaching salaries to cost of instruction (4.19), and the highest growth

in instructional salaries to cost of instruction (0.99). For all other athletic conferences, the graph

demonstrates in all but two athletic conferences (America East=0.83, Big South=0.94), growth in

football coaching salaries was greater than the growth in cost of instruction, from to 1.04

(Western Athletic) to 2.83 (Atlantic Coast) times greater. In comparison, growth instructional

salaries were more consistent for all conferences, from 0.19 to 0.48 the size of growth in cost of

instruction. In other words, cost of football coaching salaries was between two and nine times

greater than that of instructional salaries in each of the FBS and FCS athletic conferences,

despite the financial situation.

Table 2.

Average growth rates of variables grouped by categories

Category*	N	Instructional Salaries	Tuition	Total Athletic Coach Salaries	FB Coach Salaries	Cost of Instruction
FBS	97	15.8%	54.6%	67.1%	80.8%	53.3%
FCS	72	14.1%	47.0%	59.4%	61.9%	48.2%
BCS AQ	53	15.8%	56.0%	78.4%	96.6%	54.3%
BCS non-AQ	44	15.8%	52.9%	53.5%	61.8%	52.0%
Flagship	43	16.2%	53.3%	69.9%	88.6%	55.7%
Not Flagship	126	14.7%	43.9%	61.7%	67.4%	48.2%
America East	3	22.9%	43.1%	38.3%	54.0%	65.3%
Atlantic Coast (ACC)	8	15.4%	53.6%	89.7%	112.2%	39.7%
Big East	6	15.8%	59.3%	87.5%	119.8%	63.3%
Big Sky	10	14.0%	55.3%	49.0%	49.5%	36.8%
Big South	3	15.2%	38.3%	42.8%	75.1%	80.0%
Big Ten	10	16.0%	46.3%	58.8%	69.1%	51.3%
Big Twelve	10	17.0%	43.7%	65.4%	66.6%	54.1%
Colonial Athletic	4	11.9%	45.1%	63.8%	70.7%	43.9%
Conference USA	8	15.2%	84.4%	49.7%	54.6%	48.7%
Mid-American (MAC)	12	15.6%	23.9%	55.5%	64.8%	53.0%
Mid-Eastern Athletic (MEAC)	7	11.2%	13.8%	70.5%	71.0%	28.0%
Missouri Valley	5	17.7%	36.8%	46.0%	55.5%	41.6%
Mountain West	7	17.0%	51.8%	59.5%	68.9%	49.8%

Category*	N	Instructional Salaries	Tuition	Total Athletic Coach Salaries	FB Coach Salaries	Cost of Instruction
Pacific Ten	8	14.6%	84.1%	84.1%	91.0%	59.3%
Southeastern	11	15.5%	55.7%	90.8%	128.9%	59.2%
Southern	5	14.7%	50.8%	54.5%	51.0%	70.5%
Southland	7	13.3%	46.5%	57.1%	63.3%	59.0%
Southwestern Athletic (SWAC)	10	15.5%	55.0%	83.4%	74.3%	44.6%
Summit League	3	19.3%	40.8%	84.8%	81.4%	19.4%
Sun Belt	9	16.1%	51.3%	60.4%	72.2%	61.9%
Western Athletic	8	15.2%	67.7%	41.3%	46.4%	44.7%

* Atlantic Ten, Great West, and the Horizon League conferences each had publicly available data from less than three institutional members and were not included in this table.
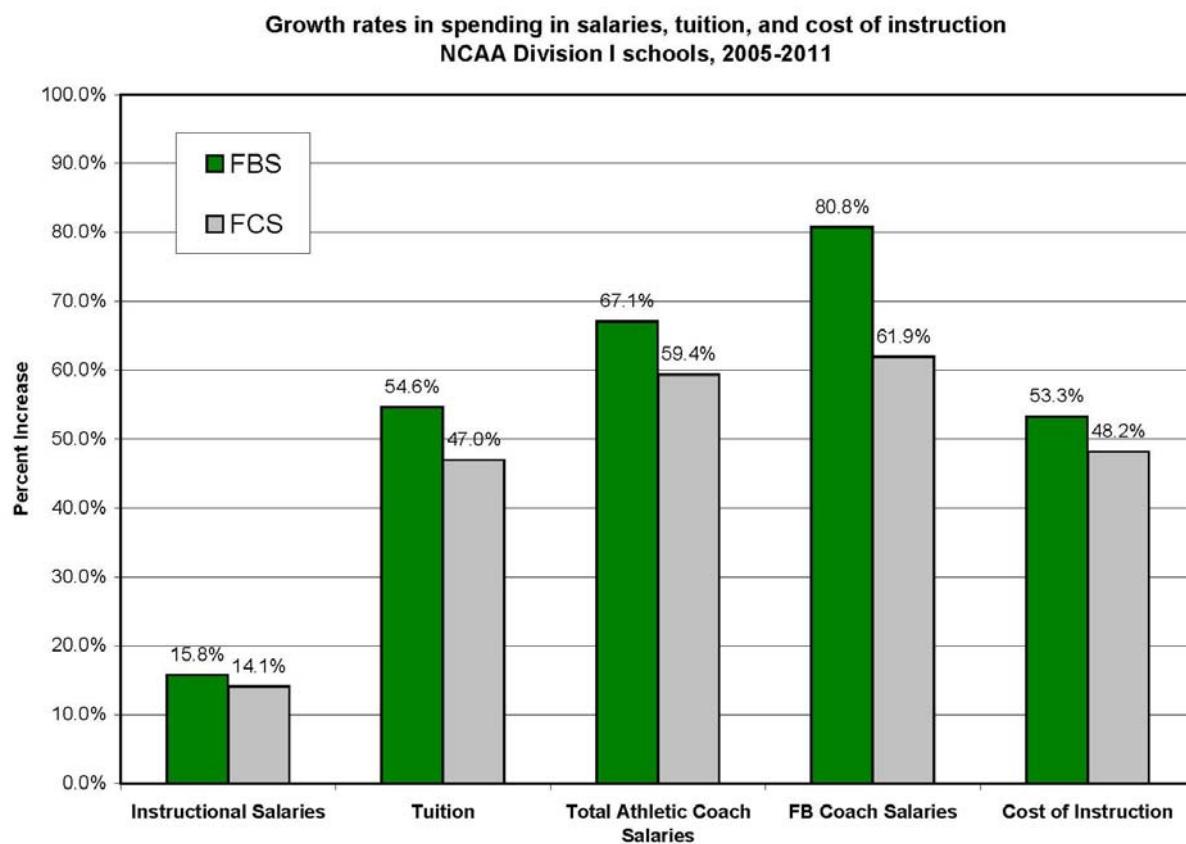
Figure 1. Growth rates by NCAA subdivision.
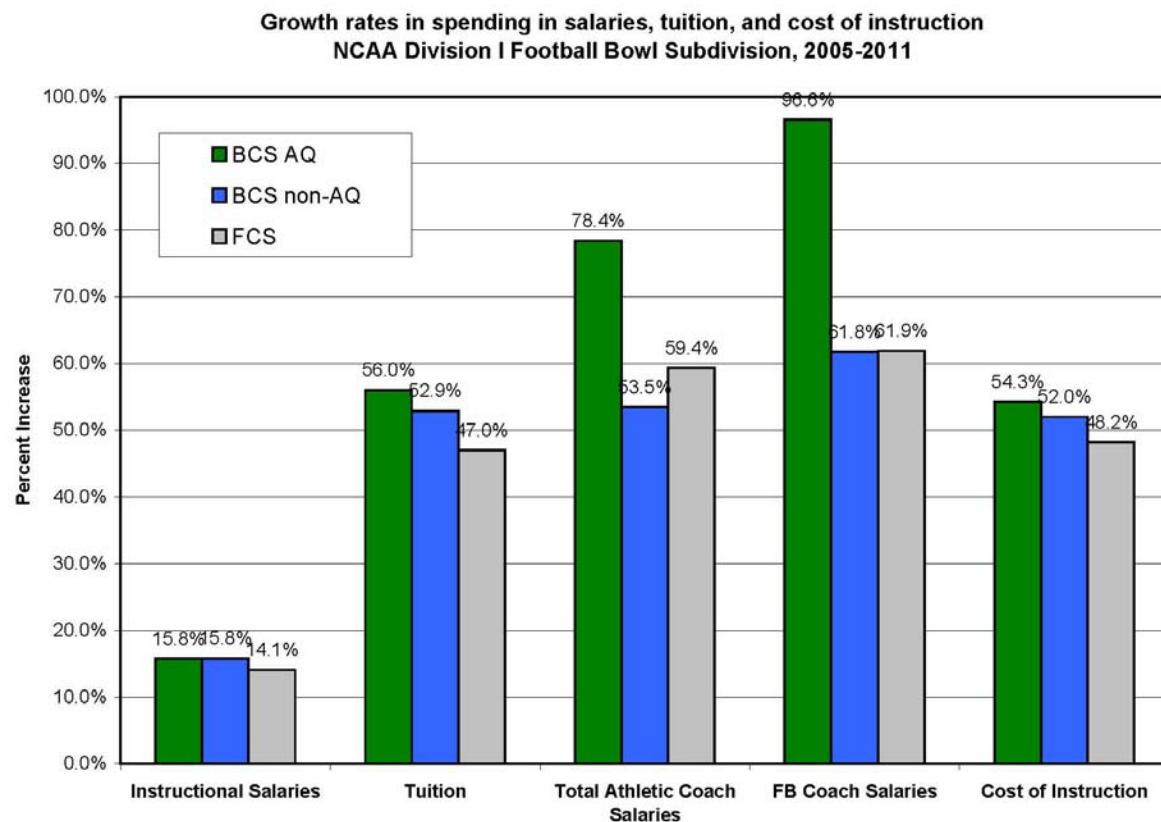
Figure 2. Growth rates by BCS Automatic Qualifying status.
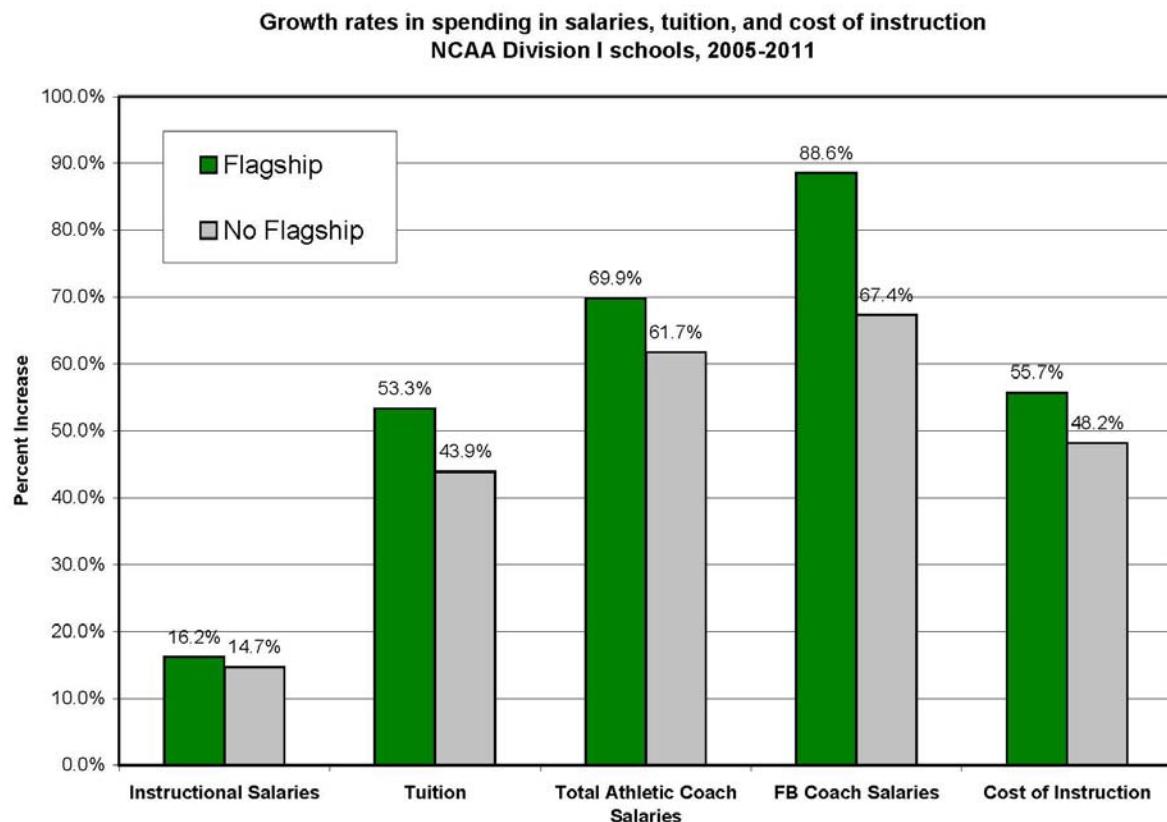
Figure 3. Growth rates by Flagship status.

Growth in Football Coaching Salaries vs Instructional Salaries, NCAA Division I, 2005-2011

NCAA Division I Athletic Conference	Instructional Salaries	Football Coaching Salaries
Southeastern	15.5%	128.9%
Big East	15.6%	119.8%
ACC	15.4%	112.2%
Pacific Ten	14.6%	91.0%
Summit League	19.3%	81.4%
Big South	15.2%	75.1%
Southwestern Athletic	15.5%	74.3%
Sun Belt	16.1%	72.2%
Mid-Eastern Athletic	11.2%	71.0%
Colonial Athletic	11.9%	70.7%
Big Ten	16.0%	69.1%
Mountain West	17.0%	68.9%
Big Twelve	17.0%	66.6%
Mid-American	15.6%	64.8%
Southland	13.3%	63.3%
Missouri Valley	17.7%	55.5%
Ohio Valley	9.4%	55.0%
Conference USA	15.2%	54.6%
America East	22.9%	54.0%
Southern	14.7%	51.0%
Big Sky	14.0%	49.5%
Western Athletic	15.2%	46.4%

Percent Change, 2005-2011

Figure 4. Growth in salaries by athletic conference.
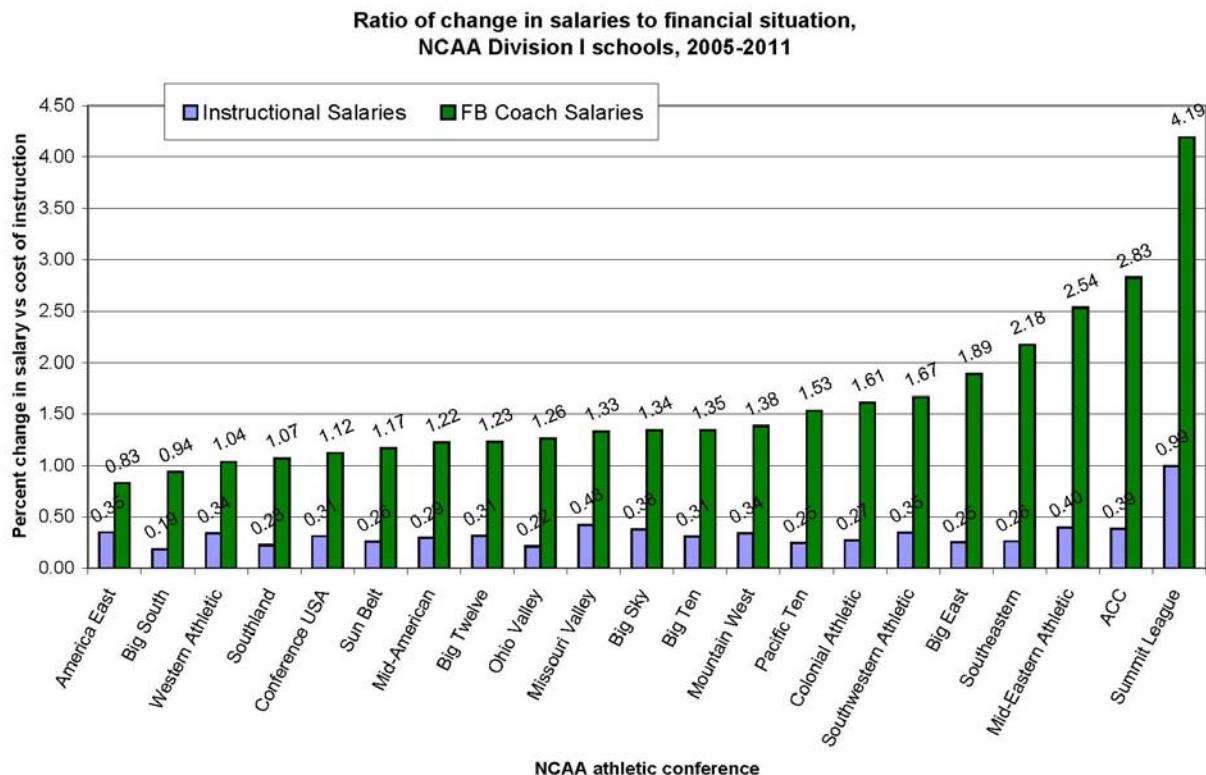
Figure 5. Change in instructional and football coaching salaries compared to financial situation.

In no category were there strong correlations between growth in instructional salaries and growth in coaching salaries, and there were no discernable patterns to be found in growth of the cost of instruction and instructional salaries on one hand or growth in athletic expenses and athletic salaries on the other (Appendix C). There were, however, fairly strong, positive correlations in the growth of football coaching salaries and total athletic coaching salaries as a whole (Table 3), despite the headlines generated by fast-growing football coaching salaries (Berkowitz, 2012; Brady, Upton, & Berkowitz, 2011; Clark, 2012; Grasgreen, 2012). While some of this may be attributed to the significance of football coaching salaries as a component of total athletic coaching salaries, football coaching salaries may not entirely explain this finding. There were a few other areas where moderate correlations were found, including a moderate positive correlation between total athletic coaching salaries and cost of instruction (r=.42, n=43)

and football coaching salaries and cost of instruction (r=.45, n=43) among flagship institutions.

There was also found to be moderate positive correlation between football coaching salaries and

cost of instruction among BCS AQ schools with the top third of expenses (r=.54, n= 18). There

was a moderate positive correlation between athletic coaching salaries and in-state tuition among

BCS AQ schools with the top third of expenses (r=.44, n=18) and BCS AQ schools with the top

half of expenses (r=.40, n=28).

Table 3.

Strongest correlations among growth of variables from 2005-2011

Variable (Category)	Cost of Instruction	In-State Tuition	Athletic Coaching Salaries
Football Coaching Salaries (BCS AQ)			.8469
Football Coaching Salaries (BCS not AQ)			.7727
Football Coaching Salaries (FBS)			.8455
Football Coaching Salaries (FCS)			.5445
Athletic Coaching Salaries (Flagship schools)	.4221		
Football Coaching Salaries (Flagship schools)	.4544		.8624
Football Coaching Salaries (Not Flagship schools)			.6742
Athletic Coaching Salaries (BCS AQ top third expenses)		.4369	
Football Coaching Salaries (BCS AQ top third expenses)	.5449		.8525
Football Coaching Salaries (BCS AQ bottom two-third expenses)			.8456
Athletic Coaching Salaries (BCS AQ top half expenses)		.4047	
Football Coaching Salaries (BCS AQ top half expenses)			.8582
Football Coaching Salaries (BCS AQ bottom half expenses)			.8283

ANOVA results were mixed (Appendix C), with most significant statistical relationships

presented in Table 4. Results ultimately showed that athletic conference membership

$[F(25,143)=1.64, p=.04]$ and membership in a BCS AQ conference $[F(2,166)=7.48, p=.000]$

were significant predictors of variance on total athletic coaching salaries. In addition, athletic

conference membership $[F(25,143)=1.85, p=.01]$, membership in a BCS AQ conference

$[F(2,166)=9.87, p=.000]$, subdivision status $[F(1,167)=6.17, p=.01]$, and flagship status

$[F(1,167)=6.05, p=.01]$ were significant predictors on variance of football coaching salaries.

To some extent, athletic conference also was a significant predictor of the variance in cost of

instruction (to which we are using as an institution's financial situation) $[F(25,143)=1.73, p=.02]$.

However, there was no significant finding of the impact of categorical status on instructional

salaries or tuition rates (Appendix C).

Table 4.

Significant ANOVA results of variables presented by categorical grouping

Variable and category	SS	df	MS	F
Total Athletic coaching salaries by Athletic Conference	21.0521864	168	.125310633	1.64*
Total Athletic coaching salaries by BCS AQ	21.0521864	168	.125310633	7.48***
Football coaching salaries by Athletic Conference	41.2457321	168	.24551031	1.85*
Football coaching salaries by BCS AQ	41.2457321	168	.24551031	9.87***
Football coaching salaries by Division	41.2457321	168	.24551031	6.17*
Football coaching salaries by Flagship	41.2457321	168	.24551031	6.05*
Cost of instruction by Athletic Conference	10.3090236	168	.061363236	1.73*

***p<.001, ** p<.01, * p<.05

Results from paired sample t-tests on growth rates of instructional salaries and football

coaching salaries on all in all categories measured in the study (Table 1), were statistically

significant (p<.05) in all but three athletic conferences: America East, Atlantic Ten, and Summit

League. In aggregate, these findings imply the data were not randomly drawn from the same

sample. Including all the t-test results in the body of the paper would be exhaustive, and are

instead presented in Appendix E.

Conclusions

At every level of this study's investigation of spending for athletics competition at the

nation's largest research institutions, tuition is up, faculty salaries are flat, and athletics salaries

keep rising. What does this mean? This study set out to determine the extent to which athletic

coaching salaries are tied to the academic marketplace. Below, we share our conclusions and recommendations.

The top of FBS may well be able to do all that they're doing given the new revenue streams from media contracts to broadcast the NCAA Division I men's basketball tournament, BCS football playoff, and with individual athletic conferences (Knight Commission, 2013, Knight Commission, 2011) -- if institutional leaders at the top of the FBS remember that even the new revenue has limits. The data demonstrate huge variances within the top of the college athletics landscape at a potential cost to the institutional mission of higher education. This study also shows a concern at the bottom half of FBS, in which institutions spend increasing amounts of money they do not have on salaries in athletics with the attempt to try and remain competitive. There really does seem to be a difference between what FCS schools can do with the financial pressures and what the bottom of FBS seems unable and unwilling to do. It is a concern about how long FCS institutions can sustain overall non-football increases against clear budget constraints.

Below, we attempt to make more specific conclusions from this data about the current financial situation in college athletics at each level of athletic competition: BCS AQ, BCS non-AQ, and FCS.

Among those institutions with the largest expenses (also known as the "Haves"), specifically those which are BCS AQ, the growth rates in athletic salaries, tuition, and cost of instructional expenses are roughly more than three times the growth in instructional salaries. In particular, growth in total coaching salaries are higher than growth in tuition and instructional salaries, and growth in football coaching salaries are about six times the increase in instructional salaries. In other words, where there is big money in athletics, football and total coaching salaries

are the recipients. And, the revenue stream may be significant enough to sustain these expenses (Knight Commission, 2013).

Institutions which are trying to catch the "Haves," primarily those of FBS which are not BCS-AQ schools, have much less growth rates in tuition, athletic expense, instructional expense and instructional salary than at AQ schools. The data demonstrate similar results for Flagship and non-Flagship institutions. In each case, the increases in football and overall coaching salaries are greater than in instructional salaries and tuition, but this increase at BCS non-AQ schools is less than at BCS-AQ schools. The conclusion from this finding is those schools that are not among the Haves are spending significant dollars on total athletics coaching and football coaching salaries despite their financial situation, though they're not being able to keep up (and, when decisions were made at these institutions to compete at the highest level, they had significantly fewer financial resources). The current revenue stream in athletics (Knight Commission, 2013) cannot sustain these decisions to keep up. Moreover, the revenue stream could not sustain it before the increases demonstrated in this study, so it is "just going from bad to worse" for these institutions.

In the FCS cohort, growth in tuition and instructional salary increases are parallel to those in FBS but smaller in each case. Growth in total athletic coaching and football coaching salaries also are significant, but clearly less so than in FBS and with a smaller gap between coaching generally and football coaching. In FCS, growth in athletic expenses is greater than the cost of instruction, and greater than in FBS. Therefore, in FCS, where football is not king, and programs are of a smaller scale, total athletics coaching and football coaching are both under better control, but overall athletic expenses are a burden, and comparatively a greater burden because the

academic (tuition) resources are more constrained and the institutions have a lower budget (lower instructional salaries and lower cost of instruction).

The descriptive statistics, correlations, ANOVAs, and visual representations support the research question that, at all levels and in all categories, the growth rate of total athletic coaching salaries and football coaching salaries has far exceeded the corresponding rate for instructional salaries at a statistically significant level, despite the financial situation.

Recommendations

This study further supports the need for dialogue within higher education about the out-of-control spending in the arms race of college athletics. By placing coaching salaries in the context of the mission of higher education, we have been able to demonstrate the differences in the financial model for athletics compared to the financial model of academics. There seems to be a difference in value placed on athletics than placed on academics. The marketplace has driven the costs for athletic salaries far beyond what is necessary to support effective coaching. This "salary bubble" may also be defined as the difference between the price attached to the "best" coach and that attached to the "best" faculty member, since presumably their work is similar. That is, whatever should be the relative difference between the "best" and "worst" coach in the coaching marketplace, what is the educational reason for that marketplace itself being wildly inflated above the faculty marketplace? Looking at the data from this perspective could help leaders identify how to collaborate on controlling or minimizing spending on athletic salaries with respect to the cost of fulfilling their academic mission. It would behoove leaders to ask the question, "What is the purpose for having an intercollegiate athletics program at our institution?" Using the data to answer such a question would be a good starting point to

reevaluate priorities, and lay out a more in-depth understanding and rationale for financing a substantially growing sector of the higher education enterprise.

The clear difference in value placed on instructional salaries compared to football coaching salaries should alarm higher education leaders. College football is a zero-sum game on the field: if one institution wins another must lose. Therefore, paying more money to hire coaches with more significant profiles does not necessarily, nor readily, translates into success, as previous research has shown (Litan, Orszag, & Orszag, 2005). For every success story, such as Urban Meyer at Ohio State University or Mike Gundy at Oklahoma State University, there is a failing story such as Derek Dooley at the University of Tennessee, Rick Neuheisel at the University of California-Los Angeles, or Jeff Tedford at the University of California-Berkeley. These are institutional decisions and not an NCAA decision, and institutional leaders need to be held accountable for the amount of money they spend on athletic coaches. The decisions are worth millions of dollars, and are a gamble.

While federal court decisions and antitrust law prohibit schools from setting limits on coaching salaries, presidents can form a coalition of peer institutions and set boundaries to control spending no more than the growth of cost of instruction. We recommend presidents and other leaders at institutions recognize their educational mission and work together in a coalition to rein in spending on coaching salaries. Furthermore, state legislators should keep a keen eye on how public institutions receiving state appropriations are spending money at far greater rates for coaches than for instructors or for reducing tuition costs.

Limitations

The scope of this study was limited by several factors. First, cost of instruction was used as a measure to determine financial situation of an institution. Other measures may be more suitable, and potentially could produce different results by the categories analyzed in this study. For instance, E&R ("Education & Research") is a commonly used measure of an institution's financial well-being, particularly in recent reports by the Knight Commission on Intercollegiate Athletics (2010) and the Delta Cost Project on Higher Education (2011). E&G ("Education & General") is also considered as a measure of institutional financial health. However, both E&R and E&G require more extensive statistical compilation than the use of cost of instruction, and each also have annual adjustment factors as well as parental relationships (for example, the University of Texas El Paso is included in the E&R and E&G totals for the University of Texas at Austin).

Another limitation is the grouping of institutions. For instance, another consideration may be to investigate athletic success of a football team or the cost for salaries relating to football success as more accurate indications of the marketplace of intercollegiate athletics. Or, including Historically Black Colleges and Universities (HBCU) as a category because these institutions have different missions, and may demonstrate different decisions in funding salaries of instructors and coaches, as well as maintaining a different balance on the cost of tuition. These different groupings may demonstrate that athletic success is the driving force behind coaching salaries, despite other studies which demonstrate a week relationship, if any, between athletics success and athletics expenses (Frank, 2004).

One other limitation of the study is the use of coaching salaries as compensation and benefits only provided by the university. Extensive media coverage about coaching

compensation and benefits from external third parties, particularly for men's basketball (Brady, Berkowitz, & Upton, 2013) and football coaches (Brady, Berkowitz, & Upton, 2012), may significantly impact the findings. In other words, many of the football and basketball coaches at the highest level of competition, notably BCS automatic qualifying institutions, are receiving increasingly significant amounts of money and benefits from private companies and corporations in addition to their university salary. The growth in this area is worth exploring and comparing to other areas of non-institutional compensation in other areas of the university.

In addition, recent movement by many institutions at the highest level of college athletics from one athletics conference affiliation to another may significantly impact the financial structure for those college athletics programs. It may be worthwhile to look at growth rates for those institutions that switch conferences. Creating a new category of "conference switching institutions" and comparing athletic salary structures before and after a conference shift may provide insights into how conference movements impact the salaries of all coaches, and particularly of football coaches. In other words, if institutions are shifting conferences because they seek additional financial resources, is there also an increase in salaries of football coaches in an attempt to improve athletic success? Such a comparison can help understand the extent to which switching allegiances in athletic conferences affects football coaching salaries.

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APPENDIX A

Institutions listed by category

Institution	Athletic Conference	Division	BCS AQ	Flagship	BCS AQ thirds	BCS AQ half
Alabama A & M University	Southwestern Athletic	FCS	n/a	no		
Alabama State University	Southwestern Athletic	FCS	n/a	no		
Alcorn State University	Southwestern Athletic	FCS	n/a	no		
Appalachian State University	Southern	FCS	n/a	no		
Arizona State University	Pacific Ten	FBS	AQ	no	Bottom thirds	bottomhalf
Arkansas State University-Main Campus	Sun Belt	FBS	noAQ	no		
Auburn University	Southeastern	FBS	AQ	no	topthird	tophalf
Austin Peay	Ohio Valley	FCS	n/a	no		
Ball State University	Mid-American	FBS	noAQ	no		
Boise State University	Mountain West	FBS	noAQ	no		
Bowling Green State University-Main Campus	Mid-American	FBS	noAQ	no		
California State University-Fresno	Western Athletic	FBS	noAQ	no		
California State University-Sacramento	Big Sky	FCS	n/a	no		
Central Connecticut State University	Northeast	FCS	n/a	no		
Central Michigan University	Mid-American	FBS	noAQ	no		
Citadel Military College of South Carolina	Southern	FCS	n/a	no		
Clemson University	Atlantic Coast	FBS	AQ	no	bottomthirds	bottomhalf
Coastal Carolina University	Big South	FCS	n/a	no		
College of William and Mary	Colonial Athletic	FCS	n/a	no		
Colorado State University-Fort Collins	Mountain West	FBS	noAQ	no		
Delaware State University	Mid-Eastern Athletic	FCS	n/a	no		
East Carolina University	Conference USA	FBS	noAQ	no		
Eastern Illinois University	Ohio Valley	FCS	n/a	no		
Eastern Kentucky University	Ohio Valley	FCS	n/a	no		
Eastern Michigan University	Mid-American	FBS	noAQ	no		
Eastern Washington University	Big Sky	FCS	n/a	no		
Florida Agricultural and Mechanical University	Mid-Eastern Athletic	FCS	n/a	no		
Florida Atlantic University	Sun Belt	FBS	noAQ	no		
Florida International University	Sun Belt	FBS	noAQ	no		
Florida State University	Atlantic Coast	FBS	AQ	no	topthird	tophalf
Georgia Institute of Technology-Main Campus	Atlantic Coast	FBS	AQ	no	bottomthirds	bottomhalf
Georgia Southern University	Southern	FCS	n/a	no		
Grambling State University	Southwestern Athletic	FCS	n/a	no		
Idaho State University	Big Sky	FCS	n/a	no		
Illinois State University	Missouri Valley	FCS	n/a	no		
Indiana State University	Missouri Valley	FCS	n/a	no		
Indiana University-Bloomington	Big Ten	FBS	AQ	yes	bottomthirds	tophalf
Iowa State University	Big Twelve	FBS	AQ	no	bottomthirds	bottomhalf

Jackson State University	Southwestern Athletic	FCS	n/a	no		
Jacksonville State University	Ohio Valley	FCS	n/a	no		
James Madison University	Colonial Athletic	FCS	n/a	no		
Kansas State University	Big Twelve	FBS	AQ	no	bottomthirds	bottomhalf
Kent State University at Kent	Mid-American	FBS	noAQ	no		
Louisiana State University and Agricultural & Mechanical College	Southeastern	FBS	AQ	yes	topthird	tophalf
Louisiana Tech University	Western Athletic	FBS	noAQ	no		
Marshall University	Conference USA	FBS	noAQ	no		
McNeese State University	Southland	FCS	n/a	no		
Miami University-Oxford	Mid-American	FBS	noAQ	no		
Michigan State University	Big Ten	FBS	AQ	no	topthird	tophalf
Middle Tennessee State University	Sun Belt	FBS	noAQ	no		
Mississippi State University	Southeastern	FBS	AQ	no	bottomthirds	bottomhalf
Mississippi Valley State University	Southwestern Athletic	FCS	n/a	no		
Missouri State University-Springfield	Missouri Valley	FCS	n/a	no		
Montana State University	Big Sky	FCS	n/a	no		
Morehead State University	Ohio Valley	FCS	n/a	no		
Morgan State University	Mid-Eastern Athletic	FCS	n/a	no		
Murray State University	Ohio Valley	FCS	n/a	no		
New Mexico State University-Main Campus	Western Athletic	FBS	noAQ	no		
Nicholls State University	Southland	FCS	n/a	no		
Norfolk State University	Mid-Eastern Athletic	FCS	n/a	no		
North Carolina A & T State University	Mid-Eastern Athletic	FCS	n/a	no		
North Carolina State University at Raleigh	Atlantic Coast	FBS	AQ	no	bottomthirds	bottomhalf
North Dakota State University-Main Campus	Summit League	FCS	n/a	no		
Northern Arizona University	Big Sky	FCS	n/a	no		
Northern Illinois University	Mid-American	FBS	noAQ	no		
Northwestern State University of Louisiana	Southland	FCS	n/a	no		
Ohio State University-Main Campus	Big Ten	FBS	AQ	yes	topthird	tophalf
Ohio University-Main Campus	Mid-American	FBS	noAQ	no		
Oklahoma State University-Main Campus	Big Twelve	FBS	AQ	no	bottomthirds	bottomhalf
Old Dominion University	Colonial Athletic	FCS	n/a	no		
Oregon State University	Pacific Ten	FBS	AQ	no	bottomthirds	bottomhalf
Portland State University	Big Sky	FCS	n/a	no		
Prairie View A & M University	Southwestern Athletic	FCS	n/a	no		
Purdue University-Main Campus	Big Ten	FBS	AQ	no	bottomthirds	bottomhalf
Rutgers University-New Brunswick	Big East	FBS	AQ	yes	bottomthirds	bottomhalf
Sam Houston State University	Southland	FCS	n/a	no		
San Diego State University	Mountain West	FBS	noAQ	no		
San Jose State University	Western Athletic	FBS	noAQ	no		
Savannah State University	Mid-Eastern Athletic	FCS	n/a	no		
South Carolina State University	Mid-Eastern Athletic	FCS	n/a	no		
South Dakota State University	Summit League	FCS	n/a	no		

Southeast Missouri State University	Ohio Valley	FCS	n/a	no		
Southeastern Louisiana University	Southland	FCS	n/a	no		
Southern Illinois University Carbondale	Missouri Valley	FCS	n/a	no		
Southern University and A & M College	Southwestern Athletic	FCS	n/a	no		
Southern Utah University	Big Sky	FCS	n/a	no		
Stephen F Austin State University	Southland	FCS	n/a	no		
Stony Brook University	Big South	FCS	n/a	no		
SUNY at Albany	America East	FCS	n/a	no		
Tennessee State University	Ohio Valley	FCS	n/a	no		
Tennessee Technological University	Ohio Valley	FCS	n/a	no		
Texas A & M University-College Station	Big Twelve	FBS	AQ	no	bottomthirds	tophalf
Texas Southern University	Southwestern Athletic	FCS	n/a	no		
Texas State University-San Marcos	Southland	FCS	n/a	no		
Texas Tech University	Big Twelve	FBS	AQ	no	bottomthirds	bottomhalf
Towson University	Colonial Athletic	FCS	n/a	no		
Troy University	Sun Belt	FBS	noAQ	no		
University at Buffalo	Mid-American	FBS	noAQ	no		
University of Akron Main Campus	Mid-American	FBS	noAQ	no		
University of Alabama	Southeastern	FBS	AQ	yes	topthird	tophalf
University of Alabama at Birmingham	Conference USA	FBS	noAQ	no		
University of Arizona	Pacific Ten	FBS	AQ	yes	bottomthirds	bottomhalf
University of Arkansas	Southeastern	FBS	AQ	yes	bottomthirds	tophalf
University of Arkansas at Pine Bluff	Southwestern Athletic	FCS	n/a	no		
University of California-Berkeley	Pacific Ten	FBS	AQ	yes	bottomthirds	bottomhalf
University of California-Davis	Great West	FCS	n/a	no		
University of California-Los Angeles	Pacific Ten	FBS	AQ	no	bottomthirds	bottomhalf
University of Central Florida	Conference USA	FBS	noAQ	no		
University of Cincinnati-Main Campus	Big East	FBS	AQ	no	bottomthirds	bottomhalf
University of Colorado Boulder	Big Twelve	FBS	AQ	yes	bottomthirds	bottomhalf
University of Connecticut	Big East	FBS	AQ	yes	bottomthirds	bottomhalf
University of Florida	Southeastern	FBS	AQ	yes	topthird	tophalf
University of Georgia	Southeastern	FBS	AQ	yes	topthird	tophalf
University of Hawaii at Manoa	Western Athletic	FBS	noAQ	yes		
University of Houston	Conference USA	FBS	noAQ	no		
University of Idaho	Western Athletic	FBS	noAQ	yes		
University of Illinois at Urbana-Champaign	Big Ten	FBS	AQ	yes	bottomthirds	tophalf
University of Iowa	Big Ten	FBS	AQ	yes	topthird	tophalf
University of Kansas	Big Twelve	FBS	AQ	yes	bottomthirds	tophalf
University of Kentucky	Southeastern	FBS	AQ	yes	topthird	tophalf
University of Louisiana at Lafayette	Sun Belt	FBS	noAQ	no		
University of Louisiana-Monroe	Sun Belt	FBS	noAQ	no		
University of Louisville	Big East	FBS	AQ	no	topthird	tophalf

University of Maine	America East	FCS	n/a	yes		
University of Maryland-College Park	Atlantic Coast	FBS	AQ	yes	bottomthirds	bottomhalf
University of Massachusetts Amherst	Atlantic 10	FCS	n/a	yes		
University of Memphis	Conference USA	FBS	noAQ	no		
University of Michigan-Ann Arbor	Big Ten	FBS	AQ	yes	topthird	tophalf
University of Minnesota-Twin Cities	Big Ten	FBS	AQ	yes	bottomthirds	tophalf
University of Mississippi	Southeastern	FBS	AQ	yes	bottomthirds	bottomhalf
University of Missouri-Columbia	Big Twelve	FBS	AQ	yes	bottomthirds	bottomhalf
University of Montana	Big Sky	FCS	n/a	yes		
University of Nebraska-Lincoln	Big Ten	FBS	AQ	yes	topthird	tophalf
University of Nevada-Las Vegas	Mountain West	FBS	noAQ	no		
University of Nevada-Reno	Western Athletic	FBS	noAQ	yes		
University of New Hampshire-Main Campus	America East	FCS	n/a	yes		
University of New Mexico-Main Campus	Mountain West	FBS	noAQ	yes		
University of North Carolina at Chapel Hill	Atlantic Coast	FBS	AQ	yes	bottomthirds	tophalf
University of North Texas	Sun Belt	FBS	noAQ	no		
University of Northern Colorado	Big Sky	FCS	n/a	no		
University of Northern Iowa	Missouri Valley	FCS	n/a	no		
University of Oklahoma Norman Campus	Big Twelve	FBS	AQ	yes	topthird	tophalf
University of Oregon	Pacific Ten	FBS	AQ	yes	bottomthirds	tophalf
University of Rhode Island	Atlantic 10	FCS	n/a	yes		
University of South Carolina-Columbia	Southeastern	FBS	AQ	yes	topthird	tophalf
University of South Florida-Main Campus	Big East	FBS	AQ	no	bottomthirds	bottomhalf
University of Southern Mississippi	Conference USA	FBS	noAQ	no		
University of Tennessee	Southeastern	FBS	AQ	yes	topthird	tophalf
University of Tennessee at Chattanooga	Southern	FCS	n/a	no		
University of Tennessee-Martin	Ohio Valley	FCS	n/a	no		
University of Texas at Austin	Big Twelve	FBS	AQ	yes	topthird	tophalf
University of Texas at El Paso	Conference USA	FBS	noAQ	no		
University of Toledo	Mid-American	FBS	noAQ	no		
University of Utah	Mountain West	FBS	noAQ	yes		
University of Virginia-Main Campus	Atlantic Coast	FBS	AQ	yes	bottomthirds	tophalf
University of Washington-Seattle Campus	Pacific Ten	FBS	AQ	yes	bottomthirds	bottomhalf
University of Wisconsin-Madison	Big Ten	FBS	AQ	yes	topthird	tophalf
University of Wyoming	Mountain West	FBS	noAQ	yes		
Utah State University	Western Athletic	FBS	noAQ	no		
Virginia Military Institute	Big South	FCS	n/a	no		
Virginia Polytechnic Institute and State University	Atlantic Coast	FBS	AQ	no	bottomthirds	bottomhalf
Washington State University	Pacific Ten	FBS	AQ	no	bottomthirds	bottomhalf
Weber State University	Big Sky	FCS	n/a	no		
West Virginia University	Big East	FBS	AQ	yes	bottomthirds	bottomhalf
Western Carolina University	Southern	FCS	n/a	no		

Western Illinois University	Summit League	FCS	n/a	no
Western Kentucky University	Sun Belt	FBS	noAQ	no
Western Michigan University	Mid-American	FBS	noAQ	no
Youngstown State University	Horizon League	FCS	n/a	no

APPDENDIX B

Growth rates of variables by category

FBS members of conferences with automatic qualifier to the BCS (BCS AQ)	Growth rate in...	N	Mean	S.D.	Min	Max
	In-state tuition	53	56.05%	27.54%	6.09%	166.70%
	Instructional salaries	53	15.75%	5.90%	5.20%	27.76%
	Athletic coaching salaries	53	78.41%	36.16%	19.92%	258.37%
	Football coaching salaries	53	96.58%	58.58%	8.39%	291.15%
	Total Athletic Expenses	53	56.53%	23.86%	15.83%	119.40%
	Cost of instruction	53	54.28%	24.42%	2.81%	119.74%
FBS members of conferences that lack automatic qualifier to the BCS (BCS non-AQ)	Growth rate in...	N	Mean	S.D.	Min	Max
	In-state tuition	44	52.91%	52.80%	45.26%	331.08%
	Instructional salaries	44	15.80%	4.62%	4.69%	24.49%
	Athletic coaching salaries	44	53.49%	25.58%	14.24%	128.78%
	Football coaching salaries	44	61.77%	32.05%	1.05%	147.01%
	Total Athletic Expenses	44	51.93%	28.38%	9.87%	149.39%
	Cost of instruction	44	52.03%	18.72%	5.61%	101.59%
	Growth rate in...	N	Mean	S.D.	Min	Max
Football Bowl Subdivision (FBS)	In-state tuition	97	54.62%	40.77%	45.26%	331.08%
	Instructional salaries	97	15.77%	5.33%	5.20%	27.76%
	Athletic coaching salaries	97	67.10%	34.01%	14.24%	258.37%
	Football coaching salaries	97	80.79%	51.20%	1.05%	291.15%
	Total Athletic Expenses	97	54.44%	25.97%	9.87%	149.39%
	Cost of instruction	97	53.26%	21.94%	5.61%	119.74%
	Growth rate in...	N	Mean	S.D.	Min	Max
Football Championship Subdivision (FCS)	In-state tuition	72	47.95%	25.60%	0.00%	170.80%
	Instructional salaries	72	14.09%	7.24%	11.87%	37.81%
	Athletic coaching salaries	72	59.37%	36.96%	3.52%	256.78%
	Football coaching salaries	72	61.93%	45.35%	3.44%	319.61%
	Total Athletic Expenses	67	66.14%	37.87%	15.94%	205.92%
	Cost of instruction	72	45.86%	27.73%	12.18%	113.31%
	Growth rate in...	N	Mean	S.D.	Min	Max
Non-flagship institution	In-state tuition	126	51.25%	37.58%	45.26%	331.08%
	Instructional salaries	126	14.67%	6.31%	11.87%	37.81%
	Athletic coaching salaries	126	61.74%	32.94%	3.52%	256.78%
	Football coaching salaries	126	67.36%	43.56%	3.44%	319.61%
	Total Athletic Expenses	121	61.14%	34.93%	9.87%	205.92%
	Cost of instruction	126	48.19%	25.08%	12.18%	113.31%

	Growth rate in...	N	Mean	S.D.	Min	Max
Flagship institutions	In-state tuition	43	53.33%	27.29%	0.00%	139.73%
	Instructional salaries	43	16.17%	6.03%	5.20%	27.76%
	Athletic coaching salaries	43	69.87%	41.63%	14.04%	258.37%
	Football coaching salaries	43	88.58%	61.88%	12.34%	291.15%
	Total Athletic Expenses	43	53.82%	19.92%	12.87%	93.96%
	Cost of instruction	43	55.74%	23.23%	22.36%	119.74%

	Growth rate in...	N	Mean	S.D.	Min	Max
Bottom 67% of institutions in BCS-AQ conferences	In-state tuition	35	57.82%	31.02%	6.09%	166.70%
	Instructional salaries	35	15.68%	6.12%	5.20%	25.51%
	Athletic coaching salaries	35	78.85%	39.98%	33.06%	258.37%
	Football coaching salaries	35	98.13%	64.23%	8.39%	291.15%
	Expenses	35	52.68%	24.42%	15.83%	119.40%
	Cost of instruction	35	54.48%	25.88%	2.81%	112.31%
	Growth rate in...	N	Mean	S.D.	Min	Max
Top 33% of institutions in BCS-AQ conferences	In-state tuition	18	52.60%	19.40%	17.94%	89.10%
	Instructional salaries	18	15.89%	5.62%	4.40%	27.76%
	Athletic coaching salaries	18	77.55%	28.29%	19.92%	135.56%
	Football coaching salaries	18	93.58%	47.21%	35.81%	232.37%
	Expenses	18	64.02%	21.42%	26.29%	116.89%
	Cost of instruction	18	53.89%	22.03%	22.36%	119.74%
	Growth rate in...	N	Mean	S.D.	Min	Max
Bottom 50% of institutions in BCS-AQ conferences	In-state tuition	25	58.06%	35.12%	6.09%	166.70%
	Instructional salaries	25	15.26%	6.28%	5.20%	25.51%
	Athletic coaching salaries	25	72.29%	24.71%	35.32%	121.04%
	Football coaching salaries	25	88.60%	48.95%	15.36%	205.10%
	Expenses	25	51.48%	25.28%	15.83%	119.40%
	Cost of instruction	25	50.22%	25.70%	2.81%	112.31%
	Growth rate in...	N	Mean	S.D.	Min	Max
Top 50% of institutions in BCS-AQ conferences	In-state tuition	28	54.25%	18.90%	17.94%	89.10%
	Instructional salaries	28	16.19%	5.61%	3.99%	27.76%
	Athletic coaching salaries	28	83.87%	43.70%	19.92%	258.37%
	Football coaching salaries	28	103.71%	66.08%	8.39%	291.15%
	Expenses	28	61.04%	21.99%	21.02%	116.89%
	Cost of instruction	28	57.90%	23.08%	22.36%	119.74%

Conference-by-conference listings:

America East					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	3	43.07%	19.13%	21.15%	56.42%
Instructional salaries	3	22.91%	4.48%	18.80%	27.69%
Athletic coaching salaries	3	38.38%	26.11%	14.04%	65.95%
Football coaching salaries	3	54.05%	21.98%	30.44%	73.93%
Expenses	3	49.16%	20.29%	36.94%	72.58%
Cost of instruction	3	65.29%	37.25%	38.32%	107.78%
Atlantic Coast (ACC)					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	8	53.62%	25.64%	6.09%	83.51%
Instructional salaries	8	15.36%	3.79%	9.91%	20.08%
Athletic coaching salaries	8	89.68%	18.16%	62.96%	121.04%
Football coaching salaries	8	112.20%	51.27%	52.48%	205.10%
Expenses	8	41.98%	14.74%	21.02%	67.07%
Cost of instruction	8	39.69%	21.01%	2.81%	63.58%
Big East					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	6	59.28%	54.40%	18.16%	166.70%
Instructional salaries	6	15.83%	6.85%	5.49%	25.51%
Athletic coaching salaries	6	87.54%	29.71%	54.54%	120.12%
Football coaching salaries	6	119.78%	34.82%	83.85%	170.26%
Expenses	6	78.81%	33.73%	33.01%	119.40%
Cost of instruction	6	63.25%	39.56%	21.74%	112.31%
Big Sky					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	10	55.34%	20.09%	20.01%	83.96%
Instructional salaries	10	13.96%	4.38%	5.29%	19.26%
Athletic coaching salaries	10	49.00%	22.20%	8.67%	80.12%
Football coaching salaries	10	49.52%	33.55%	3.44%	105.38%
Expenses	10	59.18%	26.54%	37.23%	101.97%
Cost of instruction	10	36.84%	26.27%	5.27%	68.95%
Big South					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	3	38.35%	15.47%	21.15%	51.12%
Instructional salaries	3	15.21%	8.33%	8.84%	24.63%
Athletic coaching salaries	3	42.80%	45.34%	6.17%	93.51%
Football coaching salaries	3	75.08%	25.57%	45.70%	92.20%
Expenses	3	46.68%	27.05%	22.07%	75.65%
Cost of instruction	3	80.02%	32.58%	48.19%	113.31%
Big Ten					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	10	46.27%	18.79%	17.94%	78.31%

Instructional salaries	10	15.96%	7.31%	3.99%	27.76%
Athletic coaching salaries	10	58.85%	16.90%	19.92%	78.17%
Football coaching salaries	10	69.08%	23.02%	37.70%	107.85%
Expenses	10	50.64%	21.02%	15.83%	85.41%
Cost of instruction	10	51.32%	14.89%	23.97%	80.49%
Big Twelve					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	10	43.74%	14.41%	28.88%	72.56%
Instructional salaries	10	17.02%	4.23%	12.81%	24.06%
Athletic coaching salaries	10	65.37%	25.35%	33.06%	101.31%
Football coaching salaries	10	66.64%	38.43%	8.39%	132.46%
Expenses	10	48.96%	21.12%	20.75%	76.62%
Cost of instruction	10	54.06%	21.30%	26.83%	93.05%
Colonial Athletic					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	4	45.09%	28.87%	6.10%	74.84%
Instructional salaries	4	11.94%	2.68%	9.52%	15.01%
Athletic coaching salaries	4	63.76%	35.55%	31.57%	114.34%
Football coaching salaries	4	70.74%	45.54%	12.24%	121.79%
Expenses	4	89.23%	60.31%	47.24%	177.98%
Cost of instruction	4	43.88%	37.83%	9.01%	76.56%
Conference USA					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	8	84.37%	100.89%	32.72%	331.08%
Instructional salaries	8	15.21%	3.10%	11.55%	20.88%
Athletic coaching salaries	8	49.68%	17.03%	16.90%	74.79%
Football coaching salaries	8	54.57%	16.93%	28.17%	74.90%
Expenses	8	51.81%	26.22%	24.80%	106.49%
Cost of instruction	8	48.75%	14.01%	21.65%	71.09%
Mid-American (MAC)					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	12	23.92%	25.82%	45.26%	52.05%
Instructional salaries	12	15.63%	5.86%	4.69%	24.49%
Athletic coaching salaries	12	55.48%	31.42%	29.86%	128.78%
Football coaching salaries	12	64.82%	24.91%	30.10%	113.07%
Expenses	12	40.26%	17.24%	9.87%	82.38%
Cost of instruction	12	53.00%	24.17%	5.61%	88.42%
MidEastern Athletic (MEAC)					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	7	40.01%	23.58%	6.07%	73.83%
Instructional salaries	7	11.19%	6.54%	1.07%	21.68%
Athletic coaching salaries	7	70.51%	38.24%	31.58%	148.21%
Football coaching salaries	7	71.04%	47.13%	6.37%	130.15%
Expenses	6	85.44%	61.43%	39.27%	205.92%

Cost of instruction	7	28.02%	23.24%	12.18%	55.66%
Missouri Valley					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	5	36.80%	15.66%	18.29%	61.31%
Instructional salaries	5	17.67%	4.26%	10.88%	21.28%
Athletic coaching salaries	5	46.02%	16.69%	28.44%	65.15%
Football coaching salaries	5	55.46%	21.85%	35.10%	88.85%
Expenses	5	50.24%	42.05%	15.94%	112.22%
Cost of instruction	5	41.56%	14.32%	16.25%	50.98%
Mountain West					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	7	51.81%	36.92%	3.82%	89.93%
Instructional salaries	7	16.98%	3.61%	12.19%	21.57%
Athletic coaching salaries	7	59.48%	34.50%	14.24%	124.68%
Football coaching salaries	7	68.92%	51.41%	1.05%	147.01%
Expenses	7	73.99%	44.44%	32.86%	149.39%
Cost of instruction	7	49.77%	15.16%	31.68%	71.66%
Ohio Valley					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	10	51.82%	18.70%	18.26%	89.36%
Instructional salaries	10	9.40%	4.51%	3.12%	20.30%
Athletic coaching salaries	10	56.61%	33.92%	3.52%	118.84%
Football coaching salaries	10	54.95%	29.33%	2.84%	90.32%
Expenses	9	66.62%	27.84%	30.02%	112.17%
Cost of instruction	10	43.56%	23.05%	9.51%	74.08%
Pacific Ten					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	8	84.07%	17.79%	49.14%	113.59%
Instructional salaries	8	14.61%	9.98%	5.20%	25.36%
Athletic coaching salaries	8	84.06%	71.42%	41.46%	258.37%
Football coaching salaries	8	90.98%	87.99%	15.36%	291.15%
Expenses	8	49.10%	18.30%	25.67%	90.17%
Cost of instruction	8	59.33%	19.41%	36.82%	96.58%
SOUTH					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	5	50.83%	31.74%	0.00%	81.59%
Instructional salaries	5	14.67%	5.63%	6.40%	20.94%
Athletic coaching salaries	5	54.45%	19.93%	26.75%	78.47%
Football coaching salaries	5	51.03%	25.16%	18.18%	86.46%
Expenses	5	45.67%	27.95%	23.80%	92.89%
Cost of instruction	5	70.45%	9.00%	60.79%	85.19%
Southeastern					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	11	55.73%	19.77%	34.03%	89.10%

Instructional salaries	11	15.47%	3.25%	9.98%	20.55%
Athletic coaching salaries	11	90.75%	28.68%	41.38%	135.56%
Football coaching salaries	11	128.87%	69.47%	35.81%	263.40%
Expenses	11	72.60%	17.83%	45.37%	108.08%
Cost of instruction	11	59.21%	29.40%	22.36%	119.74%
Southland					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	7	46.46%	22.28%	1.56%	72.82%
Instructional salaries	7	13.31%	4.70%	8.84%	21.44%
Athletic coaching salaries	7	57.08%	17.40%	44.44%	94.13%
Football coaching salaries	7	63.35%	24.61%	32.31%	102.72%
Expenses	5	80.20%	33.29%	30.06%	112.72%
Cost of instruction	7	58.98%	16.13%	34.80%	78.88%
Southwestern Athletic					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	10	55.03%	43.83%	14.67%	170.80%
Instructional salaries	10	15.49%	13.34%	11.87%	37.81%
Athletic coaching salaries	10	83.35%	66.42%	21.83%	256.78%
Football coaching salaries	10	74.30%	90.94%	12.00%	319.61%
Expenses	9	74.33%	46.75%	18.32%	175.47%
Cost of instruction	10	44.54%	31.56%	6.16%	94.10%
Summit League					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	3	40.83%	0.54%	40.36%	41.43%
Instructional salaries	3	19.30%	8.96%	9.86%	27.69%
Athletic coaching salaries	3	84.76%	26.15%	57.07%	109.03%
Football coaching salaries	3	81.38%	44.90%	53.05%	133.15%
Expenses	3	83.19%	37.24%	40.98%	111.40%
Cost of instruction	3	19.41%	31.22%	8.77%	52.97%
Sun Belt					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	9	51.30%	17.76%	24.51%	87.15%
Instructional salaries	9	16.11%	5.55%	9.27%	23.69%
Athletic coaching salaries	9	60.36%	18.86%	31.80%	86.49%
Football coaching salaries	9	72.22%	26.73%	42.86%	120.58%
Expenses	9	50.24%	18.81%	27.31%	82.77%
Cost of instruction	9	61.92%	21.50%	36.33%	101.59%
Western Athletic					
Growth rate in...	N	Mean	S.D.	Min	Max
In-state tuition	8	67.73%	39.31%	6.02%	139.73%
Instructional salaries	8	15.25%	4.33%	9.90%	23.53%
Athletic coaching salaries	8	41.33%	21.47%	15.46%	84.58%
Football coaching salaries	8	46.40%	37.79%	6.89%	118.84%
Expenses	8	52.17%	31.19%	12.87%	103.93%

Cost of instruction	8	44.71%	10.38%	33.19%	61.82%

APPENDIX C

Correlation of growth in variables by category

-> BCSAQ = AQ						
(obs=53)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	-0.0091	1.0000				
Instructional Salaries	0.1261	-0.2948	1.0000			
Athletic Coaching Salaries	0.2183	0.2260	0.1122	1.0000		
Football Coaching Salaries	0.2343	0.1662	0.0851	*0.8469*	1.0000	
Expenses	0.1083	0.1713	-0.1222	*0.4069*	*0.4108*	1.0000
-> BCSAQ = noAQ						
(obs=44)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	0.1570	1.0000				
Instructional Salaries	0.2422	0.1280	1.0000			
Athletic Coaching Salaries	0.2064	-0.1961	0.2042	1.0000		
Football Coaching Salaries	0.0618	-0.1727	0.2012	*0.7727*	1.0000	
Expenses	0.2363	0.0585	0.2374	0.3864	0.2122	1.0000
-> Division = FBS						
(obs=97)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	0.0760	1.0000				
Instructional Salaries	0.1642	-0.0552	1.0000			
Athletic Coaching Salaries	0.2181	0.0165	0.1294	1.0000		
Football Coaching	0.1938	0.0199	0.1057	*0.8455*	1.0000	

	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Salaries						
Expenses	0.1632	0.0981	0.0330	0.3900	0.3290	1.0000

-> Division = FCS
(obs=67)

	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	-0.1707	1.0000				
Instructional Salaries	0.0930	-0.3118	1.0000			
Athletic Coaching Salaries	-0.0273	0.0892	-0.2049	1.0000		
Football Coaching Salaries	-0.0351	0.1373	-0.1202	*0.5445*	1.0000	
Expenses	-0.0919	0.2553	-0.1838	*0.6809*	0.3401	1.0000

-> Flagship = no
(obs=121)

	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	0.0243	1.0000				
Instructional Salaries	0.1430	-0.1340	1.0000			
Athletic Coaching Salaries	-0.0338	0.0397	-0.0817	1.0000		
Football Coaching Salaries	-0.0802	0.0758	-0.0106	*0.6742*	1.0000	
Expenses	-0.0518	0.1394	-0.1433	*0.5092*	0.2244	1.0000

-> Flagship = yes
(obs=43)

	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of	1.0000					
In-State Tuition	-0.1025	1.0000				
Instructional Salaries	0.0770	-0.1244	1.0000			
Athletic Coaching Salaries	*0.4221*	0.0827	0.1231	1.0000		
Football Coaching Salaries	*0.4544*	0.0590	0.0932	*0.8624*	1.0000	
Expenses	0.3760	0.0497	0.1053	*0.5651*	*0.5703*	1.0000

-> BCSAQthirds = bottomthirds						
(obs=35)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	-0.0712	1.0000				
Instructional Salaries	0.1600	-0.2728	1.0000			
Athletic Coaching Salaries	0.1820	0.1789	0.2382	1.0000		
Football Coaching Salaries	0.1373	0.1248	0.1787	*0.8456*	1.0000	
Expenses	0.0418	0.1941	-0.0090	*0.4044*	*0.4112*	1.0000
-> BCSAQthirds = topthird						
(obs=18)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	0.2186	1.0000				
Instructional Salaries	0.0405	-0.3872	1.0000			
Athletic Coaching Salaries	0.3410	*0.4369*	-0.2712	1.0000		
Football Coaching Salaries	*0.5449*	0.3343	-0.1876	*0.8525*	1.0000	
Expenses	0.3070	0.2204	-0.4281	*0.4860*	*0.4967*	1.0000
-> BCSAQhalf =						
(obs=111)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	-0.0034	1.0000				
Instructional Salaries	0.1337	-0.0849	1.0000			
Athletic Coaching Salaries	0.0364	-0.0636	-0.1001	1.0000		
Football Coaching Salaries	0.0003	-0.0292	-0.0203	*0.6189*	1.0000	

Expenses	-0.0213	0.1204	-0.1031	*0.5891*	0.2763	1.0000
-> BCSAQhalf = bottomhalf						
(obs=25)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	-0.0225	1.0000				
Instructional Salaries	0.1284	-0.3812	1.0000			
Athletic Coaching Salaries	0.0544	0.1566	0.0972	1.0000		
Football Coaching Salaries	0.0249	0.1019	0.0161	*0.8283*	1.0000	
Expenses	-0.0840	0.2420	-0.0683	0.3107	0.3508	1.0000
-> BCSAQhalf = tophalf						
(obs=28)						
	Cost of Instruction	In-State Tuition	Instructional Salaries	Athletic Coaching Salaries	Football Coaching Salaries	Expenses
Cost of Instruction	1.0000					
In-State Tuition	0.0470	1.0000				
Instructional Salaries	0.1011	-0.1483	1.0000			
Athletic Coaching Salaries	0.2945	*0.4047*	0.1119	1.0000		
Football Coaching Salaries	0.3677	0.3114	0.1224	*0.8582*	1.0000	
Expenses	0.2643	0.1048	-0.2251	*0.4676*	*0.4468*	1.0000

APPENDIX D

Analysis of variance (ANOVA) of variables by category

	SS	Df	MS	F
Cost of instruction BCS AQ	10.3090236	168	.061363236	1.96
In-state tuition BCS AQ	20.792846	168	.123766941	0.84
Instructional salaries BCS AQ	0.657065177	168	.003911102	1.51
Athletic coaching salaries BCS AQ	21.0521864	168	.125310633	7.48***
Football coaching salaries BCS AQ	41.2457321	168	.24551031	9.87***
Cost of instruction Athletic Conference	10.3090236	168	.061363236	1.73*
In-state tuition Athletic Conference	20.792846	168	.123766941	1.13
Instructional salaries Athletic Conference	0.657065177	168	.003911102	1.00
Athletic coaching salaries Athletic Conference	21.0521864	168	.125310633	1.64*
Football coaching salaries Athletic Conference	41.2457321	168	.24551031	1.85*
Cost of instruction Division	10.3090236	168	.061363236	3.74
In-state tuition Division	20.792846	168	.123766941	1.49
Instructional salaries Division	0.657065177	168	.003911102	3.04
Athletic coaching salaries Division	21.0521864	168	.125310633	1.99
Football coaching salaries Division	41.2457321	168	.24551031	6.17*
Cost of instruction Flagship	10.3090236	168	.061363236	3.01
In-state tuition Flagship	20.792846		.123766941	0.11
Instructional salaries Flagship	0.657065177	168	.003911102	1.83
Athletic coaching salaries Flagship	21.0521864	168	.125310633	1.70
Football coaching salaries Flagship	41.2457321	168	.24551031	6.05*
Cost of instruction BCS AQ thirds	3.10218459	52	.059657396	0.01
In-state tuition BCS AQ thirds	3.94305985	52	.075828074	0.42
Instructional salaries BCS AQ thirds	0.180921903	52	.003479267	0.01
Athletic coaching salaries BCS AQ thirds	6.79831166	52	.130736763	0.02
Football coaching salaries BCS AQ thirds	17.841635	52	.343108366	0.07
Cost of instruction BCS AQ halves	3.10218459	52	.059657396	1.31
In-state tuition BCS AQ halves	3.94305985	52	.075828074	0.25
Instructional salaries BCS AQ halves	0.180921903	52	.003479267	0.32
Athletic coaching salaries BCS AQ halves	6.79831166	52	.130736763	1.36
Football coaching salaries BCS AQ halves	17.841635	52	.343108366	0.88

***p<.001, ** p<.01, * p<.05

```
oneway Cost of instruction BCSAQ
Analysis of Variance
Source   SS        df      MS       F        Prob > F
Between groups  .238167132    2        .119083566    1.96     0.1437
Within groups   10.0708565   166     .06066781
Total    10.3090236   168     .061363236
Bartlett's test for equal variances:    chi2(2) =       7.5447 Prob>chi2 = 0.023

oneway In-state tuition BCSAQ
Analysis of Variance
Source   SS        df      MS       F        Prob > F
Between groups  .207879059    2        .103939529    0.84     0.4343
Within groups   20.584967    166     .124005825
Total    20.792846    168     .123766941
Bartlett's test for equal variances:    chi2(2) =       35.7225 Prob>chi2 = 0.000

oneway Instructional salaries BCSAQ
Analysis of Variance
Source   SS        df      MS       F        Prob > F
Between groups  .011748923    2        .005874461    1.51     0.2237
Within groups   .645316254   166     .003887447
Total    .657065177   168     .003911102
Bartlett's test for equal variances:    chi2(2) =       10.1735 Prob>chi2 = 0.006

oneway Athletic coaching salaries BCSAQ
Analysis of Variance
Source   SS        df      MS       F        Prob > F
```

```
Between groups   1.74024147      2       .870120733     7.48      0.0008
Within groups    19.3119449     166      .116337018
Total     21.0521864           168      .125310633
Bartlett's test for equal variances:     chi2(2) =        7.2126 Prob>chi2 = 0.027

oneway Football coaching salaries BCSAQ
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   4.38351016      2       2.19175508     9.87      0.0001
Within groups    36.8622219     166      .222061578
Total     41.2457321           168      .24551031
Bartlett's test for equal variances:     chi2(2) =       15.8373 Prob>chi2 = 0.000

oneway Expenses BCSAQ
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   .593106317      2       .296553159     3.01      0.0523
Within groups    15.888435      161      .098685932
Total     16.4815414           163      .101113751
Bartlett's test for equal variances:     chi2(2) =       12.5686 Prob>chi2 = 0.002
.

oneway Cost of instruction AthleticConference
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   2.39551068      25      .095820427     1.73      0.0244
Within groups    7.91351293     143      .055339251
Total     10.3090236           168      .061363236
Bartlett's test for equal variances:     chi2(22) =      30.3483 Prob>chi2 = 0.110
note: Bartlett's test performed on cells with positive variance:
3 singleobservation cells not used

oneway In-state tuition AthleticConference
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   3.43772395      25      .137508958     1.13      0.3143
Within groups    17.3551221     143      .12136449
Total     20.792846            168      .123766941
Bartlett's test for equal variances:     chi2(22) =      96.1600 Prob>chi2 = 0.000
note: Bartlett's test performed on cells with positive variance:
3 singleobservation cells not used

oneway Instructional salaries AthleticConference
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   .098085948      25      .003923438     1.00      0.4665
Within groups    .558979229     143      .003908946
Total     .657065177           168      .003911102
Bartlett's test for equal variances:     chi2(22) =      50.0186 Prob>chi2 = 0.001
note: Bartlett's test performed on cells with positive variance:
3 singleobservation cells not used

oneway Athletic coaching salaries AthleticConference
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   4.69351282      25      .187740513     1.64      0.0380
Within groups    16.3586736     143      .114396319
Total     21.0521864           168      .125310633
Bartlett's test for equal variances:     chi2(22) =      57.9450 Prob>chi2 = 0.000
note: Bartlett's test performed on cells with positive variance:
3 singleobservation cells not used

oneway Football coaching salaries AthleticConference
Analysis of Variance
Source   SS        df      MS         F       Prob > F
Between groups   10.0801873      25      .403207492     1.85      0.0134
Within groups    31.1655448     143      .217940873
Total     41.2457321           168      .24551031
Bartlett's test for equal variances:     chi2(22) =      65.0842 Prob>chi2 = 0.000
```

```
note: Bartlett's test performed on cells with positive variance:
3 singleobservation cells not used

oneway Expenses AthleticConference
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  3.48313796      25      .139325518      1.48      0.0812
Within groups   12.9984034      138     .094191329
Total     16.4815414     163      .101113751
Bartlett's test for equal variances:     chi2(22) =       42.4485 Prob>chi2 = 0.006
note: Bartlett's test performed on cells with positive variance:
3 singleobservation cells not used
.

oneway Cost of instruction Division
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  .226012576      1       .226012576      3.74      0.0547
Within groups   10.083011       167     .060377312
Total     10.3090236     168      .061363236
Bartlett's test for equal variances:     chi2(1) =        4.5187 Prob>chi2 = 0.034

oneway In-state tuition Division
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  .184293067      1       .184293067      1.49      0.2234
Within groups   20.608553       167     .123404509
Total     20.792846      168      .123766941
Bartlett's test for equal variances:     chi2(1) =       16.2553 Prob>chi2 = 0.000

oneway Instructional salaries Division
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  .011743263      1       .011743263      3.04      0.0831
Within groups   .645321914      167     .003864203
Total     .657065177     168      .003911102
Bartlett's test for equal variances:     chi2(1) =        7.7682 Prob>chi2 = 0.005

oneway Athletic coaching salaries Division
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  .247378016      1       .247378016      1.99      0.1607
Within groups   20.8048084      167     .124579691
Total     21.0521864     168      .125310633
Bartlett's test for equal variances:     chi2(1) =        0.5669 Prob>chi2 = 0.451

oneway Football coaching salaries Division
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  1.47029819      1       1.47029819      6.17      0.0140
Within groups   39.7754339      167     .238176251
Total     41.2457321     168      .24551031
Bartlett's test for equal variances:     chi2(1) =        1.1772 Prob>chi2 = 0.278

oneway Expenses Division
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  .542211698      1       .542211698      5.51      0.0201
Within groups   15.9393297      162     .098390924
Total     16.4815414     163      .101113751
Bartlett's test for equal variances:     chi2(1) =       11.3161 Prob>chi2 = 0.001
.

oneway Cost of instruction Flagship
Analysis of Variance
Source    SS         df      MS          F        Prob > F
Between groups  .182808012      1       .182808012      3.01      0.0843
Within groups   10.1262156      167     .060636022
Total     10.3090236     168      .061363236
```

```
Bartlett's test for equal variances:     chi2(1) =        0.3551 Prob>chi2 = 0.551

oneway In-state tuition Flagship
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .013925624    1      .013925624    0.11     0.7384
Within groups   20.7789204   167     .124424673
Total    20.792846     168     .123766941
Bartlett's test for equal variances:     chi2(1) =        5.6946 Prob>chi2 = 0.017

oneway Instructional salaries Flagship
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .007137471    1      .007137471    1.83     0.1775
Within groups   .649927707   167     .003891783
Total    .657065177    168     .003911102
Bartlett's test for equal variances:     chi2(1) =        0.1283 Prob>chi2 = 0.720

oneway Athletic coaching salaries Flagship
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .211665948    1      .211665948    1.70     0.1946
Within groups   20.8405204   167     .124793536
Total    21.0521864    168     .125310633
Bartlett's test for equal variances:     chi2(1) =        3.6726 Prob>chi2 = 0.055

oneway Football coaching salaries Flagship
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  1.44311152    1      1.44311152    6.05     0.0149
Within groups   39.8026206   167     .238339045
Total    41.2457321    168     .24551031
Bartlett's test for equal variances:     chi2(1) =        8.5032 Prob>chi2 = 0.004

oneway Expenses Flagship
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .170117284    1      .170117284    1.69     0.1955
Within groups   16.3114241   162     .100687803
Total    16.4815414    163     .101113751
Bartlett's test for equal variances:     chi2(1) =       15.8946 Prob>chi2 = 0.000
.

oneway Cost of instruction BCSAQthirds
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .000405751    1      .000405751    0.01     0.9352
Within groups   3.10177884    51     .060819193
Total    3.10218459     52     .059657396
Bartlett's test for equal variances:     chi2(1) =        0.5517 Prob>chi2 = 0.458

oneway In-state tuition BCSAQthirds
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .032429127    1      .032429127    0.42     0.5184
Within groups   3.91063072    51     .076679034
Total    3.94305985     52     .075828074
Bartlett's test for equal variances:     chi2(1) =        4.2926 Prob>chi2 = 0.038

oneway Instructional salaries BCSAQthirds
Analysis of Variance
Source   SS       df       MS       F        Prob > F
Between groups  .000049852    1      .000049852    0.01     0.9061
Within groups   .180872051    51     .003546511
Total    .180921903     52     .003479267
Bartlett's test for equal variances:     chi2(1) =        0.1546 Prob>chi2 = 0.694

oneway Athletic coaching salaries BCSAQthirds
Analysis of Variance
```

```
Source   SS        df      MS       F          Prob > F
Between groups  .002014549   1       .002014549    0.02      0.9026
Within groups   6.79629711   51      .133260728
Total    6.79831166   52      .130736763
Bartlett's test for equal variances:    chi2(1) =      2.4194 Prob>chi2 = 0.120


oneway Football coaching salaries BCSAQthirds
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .024622945   1       .024622945    0.07      0.7917
Within groups   17.8170121   51      .349353178
Total    17.841635    52      .343108366
Bartlett's test for equal variances:    chi2(1) =      1.9382 Prob>chi2 = 0.164


oneway Expenses BCSAQthirds
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .152884673   1       .152884673    2.78      0.1017
Within groups   2.8070872    51      .055040925
Total    2.95997187   52      .056922536
Bartlett's test for equal variances:    chi2(1) =      0.3697 Prob>chi2 = 0.543
.

oneway Cost of instruction BCSAQhalf
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .07797579    1       .07797579     1.31      0.2568
Within groups   3.0242088    51      .059298212
Total    3.10218459   52      .059657396
Bartlett's test for equal variances:    chi2(1) =      0.2879 Prob>chi2 = 0.592


oneway In-state tuition BCSAQhalf
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .019151815   1       .019151815    0.25      0.6200
Within groups   3.92390803   51      .076939373
Total    3.94305985   52      .075828074
Bartlett's test for equal variances:    chi2(1) =      9.2229 Prob>chi2 = 0.002


oneway Instructional salaries BCSAQhalf
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .001121174   1       .001121174    0.32      0.5753
Within groups   .179800729   51      .003525504
Total    .180921903   52      .003479267
Bartlett's test for equal variances:    chi2(1) =      0.3148 Prob>chi2 = 0.575


oneway Athletic coaching salaries BCSAQhalf
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .176976219   1       .176976219    1.36      0.2484
Within groups   6.62133544   51      .129830107
Total    6.79831166   52      .130736763
Bartlett's test for equal variances:    chi2(1) =      7.5332 Prob>chi2 = 0.006


oneway Football coaching salaries BCSAQhalf
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .301630649   1       .301630649    0.88      0.3534
Within groups   17.5400044   51      .343921654
Total    17.841635    52      .343108366
Bartlett's test for equal variances:    chi2(1) =      2.1855 Prob>chi2 = 0.139


oneway Expenses BCSAQhalf
Analysis of Variance
Source   SS        df      MS       F          Prob > F
Between groups  .120611828   1       .120611828    2.17      0.1472
Within groups   2.83936004   51      .055673726
Total    2.95997187   52      .056922536
```

```
Bartlett's test for equal variances:      chi2(1) =         0.4837 Prob>chi2 = 0.487
```

APPENDIX E

Paired t-tests of instructional salaries and football salaries by category

```
. ttest istotal==fbtotal

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |   169  .1505425  .0048107   .0625388   .1410453   .1600397
 fbtotal |   169  .7275765  .0381146    .49549    .6523312   .8028218
---------+--------------------------------------------------------------------
    diff |   169  -.577034  .0382667   .4974667  -.6525795  -.5014885
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)           t = -15.0793
 Ho: mean(diff) = 0                   degrees of freedom =    168

 Ha: mean(diff) < 0       Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000     Pr(T > t) = 1.0000


. by AthleticConference, sort: ttest istotal==fbtotal

--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = America East

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |    3   .2290526  .0258913    .044845   .1176513   .3404538
 fbtotal |    3   .5404583  .1269138   .2198211  -.0056075  1.086524
---------+--------------------------------------------------------------------
    diff |    3  -.3114057   .116516   .2018117  -.8127338   .1899223
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)           t = -2.6726
 Ho: mean(diff) = 0                   degrees of freedom =     2

 Ha: mean(diff) < 0       Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0581     Pr(|T| > |t|) = 0.1161     Pr(T > t) = 0.9419


--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Atlantic 10

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |    2  .1096218  .0092957   .0131461  -.0084911   .2277348
 fbtotal |    2   .166148  .0427623    .060475  -.3771982   .7094942
---------+--------------------------------------------------------------------
    diff |    2  -.0565262   .052058   .0736211  -.7179853    .604933
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)           t = -1.0858
 Ho: mean(diff) = 0                   degrees of freedom =     1

 Ha: mean(diff) < 0       Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.2369     Pr(|T| > |t|) = 0.4738     Pr(T > t) = 0.7631


--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Atlantic Coast

Paired t test
------------------------------------------------------------------------------
```

```
Variable |   Obs     Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |    8  .1535649  .0133898   .0378721   .1219031   .1852268
 fbtotal |    8  1.122014  .1812514   .5126564   .6934227   1.550606
---------+--------------------------------------------------------------
    diff |    8  -.9684492  .1756596   .4968405  -1.383818  -.5530802
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t =  -5.5132
Ho: mean(diff) = 0                    degrees of freedom =      7

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0004    Pr(|T| > |t|) = 0.0009    Pr(T > t) = 0.9996
```


-> AthleticConference = Big East

Paired t test

```
Variable |   Obs     Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |    6  .1582679  .0279676   .0685063    .086375   .2301608
 fbtotal |    6  1.197774  .1421459   .3481848   .8323768   1.563172
---------+--------------------------------------------------------------
    diff |    6  -1.039506  .1396768   .3421368  -1.398557  -.6804559
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t =  -7.4422
Ho: mean(diff) = 0                    degrees of freedom =      5

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0003    Pr(|T| > |t|) = 0.0007    Pr(T > t) = 0.9997
```


-> AthleticConference = Big Sky

Paired t test

```
Variable |   Obs     Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |   10  .1395548  .0138461   .0437852   .1082328   .1708769
 fbtotal |   10  .4951663  .1060881   .3354801   .2551783   .7351543
---------+--------------------------------------------------------------
    diff |   10  -.3556115  .1049672   .3319354  -.5930638  -.1181591
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t =  -3.3878
Ho: mean(diff) = 0                    degrees of freedom =      9

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0040    Pr(|T| > |t|) = 0.0080    Pr(T > t) = 0.9960
```


-> AthleticConference = Big South

Paired t test

```
Variable |   Obs     Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |    3  .1520735  .0480871   .0832893  -.0548286   .3589755
 fbtotal |    3  .7508452    .14761   .2556679   .1157308    1.38596
---------+--------------------------------------------------------------
    diff |    3  -.5987717  .1254874   .2173505    -1.1387  -.0588431
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t =  -4.7716
Ho: mean(diff) = 0                    degrees of freedom =      2

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0206    Pr(|T| > |t|) = 0.0412    Pr(T > t) = 0.9794
```

```
--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Big Ten

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |    10   .1596304   .0231161   .0730997    .107338    .2119227
 fbtotal |    10   .6908367   .0728105    .230247   .5261279    .8555454
---------+--------------------------------------------------------------------
    diff |    10  -.5312063   .0752795   .2380546  -.7015003   -.3609123
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)              t = -7.0565
 Ho: mean(diff) = 0                   degrees of freedom =      9

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0001      Pr(T > t) = 1.0000


--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Big Twelve

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |    10   .1702095   .0133785   .0423065   .1399453    .2004737
 fbtotal |    10   .6663684    .121533   .3843211   .3914416    .9412951
---------+--------------------------------------------------------------------
    diff |    10  -.4961589   .1207401   .3818136  -.7692919   -.2230259
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)              t = -4.1093
 Ho: mean(diff) = 0                   degrees of freedom =      9

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0013      Pr(|T| > |t|) = 0.0026      Pr(T > t) = 0.9987


--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Colonial Athletic

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     4    .119446   .0134009   .0268018   .0767985    .1620936
 fbtotal |     4   .7073632   .2276754   .4553509  -.0172016    1.431928
---------+--------------------------------------------------------------------
    diff |     4  -.5879172   .2330261   .4660523   -1.32951     .153676
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)              t = -2.5230
 Ho: mean(diff) = 0                   degrees of freedom =      3

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0430      Pr(|T| > |t|) = 0.0860      Pr(T > t) = 0.9570


--------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Conference USA

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     8   .1521077   .0109626   .0310069   .1261853    .1780301
 fbtotal |     8   .5456963    .059856   .1692983   .4041594    .6872332
---------+--------------------------------------------------------------------
```

```
 diff |    8  -.3935886   .0577974  .1634759  -.5302578  -.2569193
---------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t = -6.8098
 Ho: mean(diff) = 0                   degrees of freedom =    7

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0001     Pr(|T| > |t|) = 0.0003     Pr(T > t) = 0.9999
```

```
------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------
-> AthleticConference = Great West

Paired t test
------------------------------------------------------------------------------
Variable |  Obs    Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |   1  .2256791      .         .        .         .
 fbtotal |   1  .4705843      .         .        .         .
---------+--------------------------------------------------------------------
    diff |   1  -.2449052      .         .        .         .
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t =    .
 Ho: mean(diff) = 0                   degrees of freedom =    0

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) =   .      Pr(|T| > |t|) =   .       Pr(T > t) =   .
```

```
------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------
-> AthleticConference = Horizon League

Paired t test
------------------------------------------------------------------------------
Variable |  Obs    Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |   1  .1083704      .         .        .         .
 fbtotal |   1  1.526169      .         .        .         .
---------+--------------------------------------------------------------------
    diff |   1  -1.417799      .         .        .         .
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t =    .
 Ho: mean(diff) = 0                   degrees of freedom =    0

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) =   .      Pr(|T| > |t|) =   .       Pr(T > t) =   .
```

```
------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------
-> AthleticConference = Mid-American

Paired t test
------------------------------------------------------------------------------
Variable |  Obs    Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |  12  .1562868  .0169199  .0586123  .1190463  .1935273
 fbtotal |  12  .6482342  .0719137  .2491163  .4899532  .8065152
---------+--------------------------------------------------------------------
    diff |  12  -.4919474  .0682234  .2363328  -.6421061  -.3417887
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t = -7.2108
 Ho: mean(diff) = 0                   degrees of freedom =   11

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000     Pr(T > t) = 1.0000
```

```
------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------
-> AthleticConference = Mid-Eastern Athletic
```

```
Paired t test
------------------------------------------------------------------------------
Variable |   Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     7   .1119361   .0247172   .0653956   .0514553   .1724169
 fbtotal |     7   .7104197   .1781201   .4712614   .2745756   1.146264
---------+--------------------------------------------------------------------
    diff |     7  -.5984837   .1865578   .4935855  -1.054974  -.1419932
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)              t =  -3.2080
Ho: mean(diff) = 0                       degrees of freedom =      6

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0092      Pr(|T| > |t|) = 0.0184      Pr(T > t) = 0.9908


------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Missouri Valley

Paired t test
------------------------------------------------------------------------------
Variable |   Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     5   .1767129   .0190482    .042593   .1238267   .2295991
 fbtotal |     5   .5545831   .0977309   .2185329   .2832387   .8259276
---------+--------------------------------------------------------------------
    diff |     5  -.3778702   .1012325   .2263627  -.6589366  -.0968038
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)              t =  -3.7327
Ho: mean(diff) = 0                       degrees of freedom =      4

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0101      Pr(|T| > |t|) = 0.0202      Pr(T > t) = 0.9899


------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Mountain West

Paired t test
------------------------------------------------------------------------------
Variable |   Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     7   .1698487   .0136608   .0361431   .1364219   .2032755
 fbtotal |     7   .6892187   .1943081    .514091   .2137638   1.164674
---------+--------------------------------------------------------------------
    diff |     7  -.5193701   .1951981   .5164457  -.9970026  -.0417375
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)              t =  -2.6607
Ho: mean(diff) = 0                       degrees of freedom =      6

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0187      Pr(|T| > |t|) = 0.0375      Pr(T > t) = 0.9813


------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-> AthleticConference = Northeast

Paired t test
------------------------------------------------------------------------------
Variable |   Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     1   .1732363        .          .          .          .
 fbtotal |     1   .5086548        .          .          .          .
---------+--------------------------------------------------------------------
    diff |     1  -.3354185        .          .          .          .
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)              t =      .
Ho: mean(diff) = 0                       degrees of freedom =      0
```

```
 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) =   .      Pr(|T| > |t|) =   .      Pr(T > t) =   .

--------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Ohio Valley

Paired t test
------------------------------------------------------------------------------
Variable |   Obs    Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |   10   .0939508   .0142536   .0450739   .0617069   .1261948
 fbtotal |   10   .5495329   .0927446   .293284    .3397302   .7593357
---------+--------------------------------------------------------------------
   diff  |   10  -.4555821   .0899451   .2844314  -.659052   -.2521121
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t = -5.0651
 Ho: mean(diff) = 0                  degrees of freedom =    9

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0003    Pr(|T| > |t|) = 0.0007    Pr(T > t) = 0.9997

--------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Pacific Ten

Paired t test
------------------------------------------------------------------------------
Variable |   Obs    Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |    8   .1461471   .0352993   .0998414   .0626776   .2296166
 fbtotal |    8   .9098294   .311095    .8799095   .1742067   1.645452
---------+--------------------------------------------------------------------
   diff  |    8  -.7636823   .3042446   .8605338  -1.483107  -.0442581
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t = -2.5101
 Ho: mean(diff) = 0                  degrees of freedom =    7

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0202    Pr(|T| > |t|) = 0.0404    Pr(T > t) = 0.9798

--------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------
-> AthleticConference = SOUTH

Paired t test
------------------------------------------------------------------------------
Variable |   Obs    Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |    5   .1466985   .0251687   .0562788   .0768191   .2165779
 fbtotal |    5   .5102629   .1125123   .2515851   .1978788   .8226471
---------+--------------------------------------------------------------------
   diff  |    5  -.3635645   .1264053   .2826509  -.714522   -.012607
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)            t = -2.8762
 Ho: mean(diff) = 0                  degrees of freedom =    4

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0226    Pr(|T| > |t|) = 0.0452    Pr(T > t) = 0.9774

--------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------
-> AthleticConference = Southeastern

Paired t test
------------------------------------------------------------------------------
Variable |   Obs    Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |   11   .154729   .0097858   .0324558   .1329249   .1765331
```

```
 fbtotal |   11  1.288728  .2094737  .6947457  .8219919  1.755465
---------+--------------------------------------------------------------
    diff |   11  -1.133999  .2120657  .7033424  -1.606511  -.6614875
-------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)            t = -5.3474
 Ho: mean(diff) = 0                    degrees of freedom =     10

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0002     Pr(|T| > |t|) = 0.0003      Pr(T > t) = 0.9998


--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Southland

Paired t test
-------------------------------------------------------------------------
Variable |   Obs    Mean  Std. Err.  Std. Dev. [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |    7   .133067  .0177492    .04696  .0896363  .1764977
 fbtotal |    7  .6334808  .0930136   .246091  .4058847   .861077
---------+--------------------------------------------------------------
    diff |    7  -.5004139  .1015303  .2686238  -.7488494  -.2519783
-------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)            t = -4.9287
 Ho: mean(diff) = 0                    degrees of freedom =      6

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0013     Pr(|T| > |t|) = 0.0026      Pr(T > t) = 0.9987


--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Southwestern Athletic

Paired t test
-------------------------------------------------------------------------
Variable |   Obs    Mean  Std. Err.  Std. Dev. [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |   10  .1548664   .042195  .1334323  .0594147  .2503181
 fbtotal |   10  .7429603   .287578  .9094016  .0924136  1.393507
---------+--------------------------------------------------------------
    diff |   10  -.5880939  .2960118  .9360716  -1.257719  .0815314
-------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)            t = -1.9867
 Ho: mean(diff) = 0                    degrees of freedom =      9

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0391     Pr(|T| > |t|) = 0.0782      Pr(T > t) = 0.9609


--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> AthleticConference = Summit League

Paired t test
-------------------------------------------------------------------------
Variable |   Obs    Mean  Std. Err.  Std. Dev. [95% Conf. Interval]
---------+--------------------------------------------------------------
 istotal |    3  .1929792  .0517264  .0895928  -.0295816   .41554
 fbtotal |    3  .8137984  .2592588  .4490495  -.3017023  1.929299
---------+--------------------------------------------------------------
    diff |    3  -.6208192  .3061282  .5302296  -1.937983  .6963441
-------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)            t = -2.0280
 Ho: mean(diff) = 0                    degrees of freedom =      2

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0899     Pr(|T| > |t|) = 0.1797      Pr(T > t) = 0.9101


--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
```

```
-> AthleticConference = Sun Belt

Paired t test
------------------------------------------------------------------------------
Variable |    Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |      9   .161144   .0184883    .055465   .1185098    .2037781
 fbtotal |      9  .7221555   .0891134   .2673402   .5166596    .9276513
---------+--------------------------------------------------------------------
    diff |      9  -.5610115  .0923418   .2770254  -.7739521    -.348071
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)             t =  -6.0754
 Ho: mean(diff) = 0                       degrees of freedom =       8

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0001    Pr(|T| > |t|) = 0.0003     Pr(T > t) = 0.9999


------------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> AthleticConference = Western Athletic

Paired t test
------------------------------------------------------------------------------
Variable |    Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |      8  .1524991   .0153071    .043295   .1163035    .1886946
 fbtotal |      8  .4640087   .1335918   .3778547   .1481142    .7799031
---------+--------------------------------------------------------------------
    diff |      8  -.3115096  .1264433   .3576356  -.6105004   -.0125188
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)             t =  -2.4636
 Ho: mean(diff) = 0                       degrees of freedom =       7

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0216    Pr(|T| > |t|) = 0.0432     Pr(T > t) = 0.9784

. by Division, sort: ttest istotal==fbtotal

------------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> Division = FBS

Paired t test
------------------------------------------------------------------------------
Variable |    Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     97  .1577243    .005411    .053292   .1469835     .168465
 fbtotal |     97  .8079365   .0519907   .5120495   .7047357    .9111373
---------+--------------------------------------------------------------------
    diff |     97  -.6502122  .0516995   .5091812  -.7528349   -.5475895
------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)             t = -12.5768
 Ho: mean(diff) = 0                       degrees of freedom =      96

 Ha: mean(diff) < 0      Ha: mean(diff) != 0      Ha: mean(diff) > 0
 Pr(T < t) = 0.0000    Pr(|T| > |t|) = 0.0000     Pr(T > t) = 1.0000


------------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
-> Division = FCS

Paired t test
------------------------------------------------------------------------------
Variable |    Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |     72  .1408671   .0085383   .0724499   .1238422     .157892
 fbtotal |     72  .6193138   .0534505   .4535423   .5127365     .725891
---------+--------------------------------------------------------------------
    diff |     72  -.4784467  .0550053   .4667351  -.5881241   -.3687693
```

```
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)             t = -8.6982
 Ho: mean(diff) = 0                    degrees of freedom =     71

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

. by BCSAQ, sort: ttest istotal==fbtotal

----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> BCSAQ = AQ

Paired t test
--------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------
 istotal |    53   .1575042   .0081023   .0589853   .1412458   .1737625
 fbtotal |    53   .9658388   .0804596   .5857545   .8043849   1.127293
---------+----------------------------------------------------------------
    diff |    53  -.8083346   .0801774     .5837   -.9692223   -.647447
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)             t = -10.0818
 Ho: mean(diff) = 0                    degrees of freedom =     52

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> BCSAQ = n/a

Paired t test
--------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------
 istotal |    72   .1408671   .0085383   .0724499   .1238422    .157892
 fbtotal |    72   .6193138   .0534505   .4535423   .5127365    .725891
---------+----------------------------------------------------------------
    diff |    72  -.4784467   .0550053   .4667351  -.5881241  -.3687693
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)             t = -8.6982
 Ho: mean(diff) = 0                    degrees of freedom =     71

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> BCSAQ = noAQ

Paired t test
--------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------
 istotal |    44   .1579894   .0069625   .0461837   .1439482   .1720305
 fbtotal |    44   .6177359    .048311    .320459   .5203075   .7151644
---------+----------------------------------------------------------------
    diff |    44  -.4597465   .0474032   .3144374  -.5553442  -.3641488
--------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)             t = -9.6986
 Ho: mean(diff) = 0                    degrees of freedom =     43

 Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

. by Flagship, sort: ttest istotal==fbtotal
```

```
----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> Flagship = no

Paired t test
--------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------------
 istotal |   126   .146746   .0056197    .063081    .135624   .1578681
 fbtotal |   126   .6735937  .0388082    .435621    .5967874   .7503999
---------+----------------------------------------------------------------------
    diff |   126  -.5268476  .0393484    .441685   -.6047231  -.4489722
--------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)             t = -13.3893
 Ho: mean(diff) = 0                     degrees of freedom =    125

 Ha: mean(diff) < 0        Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000


----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> Flagship = yes

Paired t test
--------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------------
 istotal |    43   .161667   .00919     .0602626    .1431209   .1802131
 fbtotal |    43   .8857587  .0943648   .6187913    .6953229   1.076195
---------+----------------------------------------------------------------------
    diff |    43  -.7240917  .0939549   .6161034   -.9137004  -.5344831
--------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)             t = -7.7068
 Ho: mean(diff) = 0                     degrees of freedom =     42

 Ha: mean(diff) < 0        Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

. by BCSAQthirds, sort: ttest istotal==fbtotal

----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> BCSAQthirds =

Paired t test
--------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------------
 istotal |   116   .1473617  .0059508   .0640924    .1355743   .1591492
 fbtotal |   116   .6187153  .0377602   .4066903    .5439195   .6935111
---------+----------------------------------------------------------------------
    diff |   116  -.4713535  .0384557   .4141807   -.5475269  -.3951802
--------------------------------------------------------------------------------
    mean(diff) = mean(istotal - fbtotal)             t = -12.2570
 Ho: mean(diff) = 0                     degrees of freedom =    115

 Ha: mean(diff) < 0        Ha: mean(diff) != 0       Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000


----------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-> BCSAQthirds = bottomthirds

Paired t test
--------------------------------------------------------------------------------
Variable |   Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+----------------------------------------------------------------------
 istotal |    35   .1568087  .0103372   .061156     .1358009   .1778165
 fbtotal |    35   .9812961  .108571    .6423149    .7606533   1.201939
```

```
---------+-----------------------------------------------------------------
  diff |    35  -.8244875   .1072072   .6342461   -1.042359   -.6066163
---------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)                  t = -7.6906
 Ho: mean(diff) = 0                        degrees of freedom =     34

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

----------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------
-> BCSAQthirds = topthird

Paired t test
---------------------------------------------------------------------------
Variable |    Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+-----------------------------------------------------------------
 istotal |    18   .1588566   .0132485   .0562088   .1309046   .1868085
 fbtotal |    18   .9357829   .1112861    .472147   .7009897   1.170576
---------+-----------------------------------------------------------------
  diff |    18  -.7769263   .1145136   .4858402   -1.018529   -.5353237
---------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)                  t = -6.7846
 Ho: mean(diff) = 0                        degrees of freedom =     17

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000

. by BCSAQhalf, sort: ttest istotal==fbtotal

----------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------
-> BCSAQhalf =

Paired t test
---------------------------------------------------------------------------
Variable |    Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+-----------------------------------------------------------------
 istotal |   116   .1473617   .0059508   .0640924   .1355743   .1591492
 fbtotal |   116   .6187153   .0377602   .4066903   .5439195   .6935111
---------+-----------------------------------------------------------------
  diff |   116  -.4713535   .0384557   .4141807   -.5475269   -.3951802
---------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)                  t = -12.2570
 Ho: mean(diff) = 0                        degrees of freedom =    115

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000


----------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------
-> BCSAQhalf = bottomhalf

Paired t test
---------------------------------------------------------------------------
Variable |    Obs     Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+-----------------------------------------------------------------
 istotal |    25   .1526367   .0125628   .0628139   .1267083    .178565
 fbtotal |    25    .886001   .0979005   .4895024   .6839443   1.088058
---------+-----------------------------------------------------------------
  diff |    25  -.7333643   .0985023   .4925116   -.9366631   -.5300655
---------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)                  t = -7.4451
 Ho: mean(diff) = 0                        degrees of freedom =     24

 Ha: mean(diff) < 0        Ha: mean(diff) != 0        Ha: mean(diff) > 0
 Pr(T < t) = 0.0000      Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000
```

```
---------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------
-> BCSAQhalf = tophalf

Paired t test
------------------------------------------------------------------------------
Variable |   Obs     Mean  Std. Err.  Std. Dev.  [95% Conf. Interval]
---------+--------------------------------------------------------------------
 istotal |   28  .1618502  .0106101  .0561435     .14008   .1836204
 fbtotal |   28  1.037123  .1248772   .660788    .7808958  1.293349
---------+--------------------------------------------------------------------
    diff |   28  -.8752724  .1240258  .6562831  -1.129752  -.6207924
------------------------------------------------------------------------------
   mean(diff) = mean(istotal - fbtotal)             t = -7.0572
Ho: mean(diff) = 0                    degrees of freedom =     27

Ha: mean(diff) < 0       Ha: mean(diff) != 0       Ha: mean(diff) > 0
Pr(T < t) = 0.0000     Pr(|T| > |t|) = 0.0000      Pr(T > t) = 1.0000
```