COMPETITIVE BALANCE IN NCAA SPORTS

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ABSTRACT

This paper attempts to determine variations in competitive balance of NCAA college sports since the induction of women's sports in 1982. The previous research that pertains to this study has been focused solely on changes in competitive balance of NCAA Division IA College Football. These past studies fail to make any comparisons between the different sports, especially women's sports, governed by the NCAA. This paper uses two common measures of competitive balance: the standard deviation of winning percentages and the Herfindahl-Hirschmann Index. It compares competitive balance across sports, divisions, conferences, and gender in the NCAA as a whole.

INTRODUCTION

The Nation Collegiate Athletic Association (NCAA) acquired control of all women's collegiate sports in 1982. The purpose of this paper is to investigate variations in competitive balance for NCAA college sports since then. The vastness of the NCAA has yet to be examined as it corresponds to competitive balance. I attempt to investigate competitive balance across different sports, seasons, divisions, conferences, and genders. I use two separate methods, the standard deviation of winning percentages and the Herfindahl-Hirschman Index to conduct my measurements.

This paper is organized as follows. The next section is a presentation of the various literatures on the study of competitive balance. It provides some background information on the topic and how competitive balance is measured. The third section analyzes the data and discusses some interesting observations. The final section concludes the paper and offers possibilities for future studies on the topic.

LITERATURE REVIEW

The study of competitive balance has been examined from many different perspectives and in the context of all types of sports. Simon Rottenberg (1955) conducted one of the first studies involving the economics of sports by investigating the labor markets of professional baseball. He noted that the ability of competitors must be approximately equal for teams in any sport to achieve financial success. His article has led to further research across the area of sports economics, including extensive research into the topic of competitive balance. This section reviews the literature in the back ground and importance of competitive balance, the ways competitive balance can be measured, the factors affecting competitive balance, and the effects of changes in competitive balance.

Introduction to Competitive Balance and Its Importance to Fans

Competitive balance is a study of how evenly distributed player talent, winning percentages, and championships are across different teams in their respected league. There is no way to determine the exact appropriate level of competitive balance because optimal balance is a determinate of the opinions and preferences of fans. Humphreys (2002, p 133) states that, "competitive balance reflects uncertainty about the outcomes of professional sporting events" and that, "to induce fans to purchase tickets to a game or to tune in to a broadcast, there must be some uncertainty regarding the outcome." Sanderson and Siegfried (2003) examine competitive imbalance as a problem, showing how closely payroll and market

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size correlate with winning as one determinate corresponding with competitive balance and discuss a number of resolutions to the problem. They refer to a national poll conducted by the MLB in 2001 where 75% of the 1000 fans polled believed that competitive balance was a serious problem and 42% indicated that they would lose interest if more teams did not have a realistic chance of winning. Zimbalist (2002) bases his study on the assumption that fans prefer uncertainty of outcomes, or in the words of MLB commissioner Allan "Bud" Selig, fans want to begin each season with hope and expectation. If the outcome of a game is easily predictable because competitors are so unevenly matched, fans aren't likely to be interested in the game because they can already determine the outcome.

Measures of Competitive Balance

There are many different ways in which one can measure competitive balance. One of the more frequently used metrics is the standard deviation of win percentages which measures the winning percentages in a given year for a league or over time for a team. Another method is the Herfindal-Hirschman Index which measures the concentration of first-place finishes or championships.

The actual standard deviation of win percentages in year t is defined by the equation

$$\sigma_{w,t} = \sqrt{\frac{\sum_{i=1}^{N}\left(WPCT_{i,t} - .500\right)^2}{N}}, \quad (1)$$

where N is the number of teams in the league and .500 is the average winning percentage. The actual standard deviation is often accompanied by the concept of an idealized standard deviation of win percentages, which assumes that all teams are equally competitive. The ideal controls for the problem associated with the actual standard deviation, where the number of games varies across sports and seasons. This idealized standard deviation measure represents perfect parity where each team has a 50/50 chance of winning each game and is shown as

$$\sigma_I = \frac{.5}{\sqrt{G}}, \quad (2)$$

with G representing the number of games played during the season by each team. The ratio of the actual to ideal standard deviations allows for comparisons between different sports and is shown as

$$R = \frac{\sigma_{w,t}}{\sigma_I}. \quad (3)$$

The measure is appropriate for determining competitive balance in a single season, but does not function properly when applied to a large number of seasons.

Humphreys (2002) illustrates this point by considering the won-loss records for teams in two hypothetical five-team leagues in each of five seasons (refer to Table I). He finds that the idealized and actual standard deviations are the same for each league despite a significant difference in relative standings between them. League 1 was dominated by Team A, which claimed all five championships in the five sample years and had identical relative standings for each year. League 2 saw more variation with each of the five championships won by a different team who also finished last once during the five seasons. Clearly League 2 is more competitively balanced than League 1, however, the actual and idealized standard deviations show them to be of equal competitive balance.

Table I: Won-Loss Records in Two Hypothetical Leagues

League 1						*League 2*					
Team	*1*	*2*	*3*	*4*	*5*	*Team*	*1*	*2*	*3*	*4*	*5*
A	4-0	4-0	4-0	4-0	4-0	F	4-0	3-1	2-2	1-3	0-4
B	3-1	3-1	3-1	3-1	3-1	G	3-1	2-2	1-3	0-4	4-0
C	2-2	2-2	2-2	2-2	2-2	H	2-2	1-3	0-4	4-0	3-1
D	1-3	1-3	1-3	1-3	1-3	I	1-3	0-4	4-0	3-1	2-2
E	0-4	0-4	0-4	0-4	0-4	J	0-4	4-0	3-1	2-2	1-3

A solution to the problem of measuring competitive balance across seasons is found in the Herfindahl-Hirschman Index, or *HHI*. *HHIs* are determined by a concentration of championships in a sports league over time measured by the distribution of the shares of championships. The actual *HHI* is calculated by finding the sum of the squares of the percentage shares of championships each team has for a certain number of seasons. The equation for *HHI* is

$$HHI = \sum_{i=1}^{N} (WS_i)^2, \tag{4}$$

where WS_i is share of championships earned by each team in a league for a particular amount of time, and N is the number of teams.

A problem arises with the actual *HHI*, which requires the number of teams to remain consistent when comparing leagues of different sizes. A measure of concentration the *HHI* will always decrease as the number of firms in a market or teams in a league increases. Depken (1999) provides a way to solve this problem. *HHIs* are similar to the standard deviation method in that they both require the comparison of actual measures to idealized measures. Perfect parity, which means each team in a league wins an equal share of championships, is found in the ideal index of

$$HHI = \frac{1}{N}, \tag{5}$$

where N again represents the number of teams in a league. Comparisons can be made across leagues of different sizes by finding the normalized HHI which is

$$dHHI = HHI - \frac{1}{N}. \tag{6}$$

Factors Influencing Competitive Balance in Various Sports

For the past half a century there have been numerous studies on changes in the competitive balance of professional and colligate sports leagues. There are also a vast number of factors that have been known to or could potentially influence competitive balance in the various sports.

Major League Baseball is one of the most frequently tested sports in the area of competitive balance. Depken (1999) conducted a study to determine how the competitiveness of baseball teams was affected by the removal of the reserve clause and the introduction of free-agency. In order to test the affects these factors had on competitive balance he calculated the *dHHI* of teams wins from 1920 to 1996 for the American League and the National League. He also factored in a set of explanatory variables, such as the distribution of playing talent and the designated hitter, which he believed altered parity across the leagues.

He found that free-agency has made the AL less competitive, while the NL has not been affected. Eckard (2001) used various measures of competitive balance to determine changes in the American League and the National League. He investigated market size and expansion as two factors responsible for changes in parity of baseball across different expansion periods, including the period primarily in question, 1995-1999. In comparing his tests, Eckard found consistent data confirming no change or a positive change towards more balance for the National League. He found mixed results for the American League, with certain tests indicating a decline in balance, others showing no change, and some even suggesting an increase in balance. Eckard believed there is a positive, but weak relationship between market size and winning for the American League and no existing relationship for the National League. Sanderson and Siegfried (2003) believed that variations in the market were very influential to the competitive structure of the MLB. They concluded that market size and location, as well as the preferences of fans and their willingness to act on those preferences all played a role in determining the appropriate level of competitive balance that is desired.

The competitive balance of English Soccer has often been used as a comparison for other sports leagues. Zimbalist (2002) described the characteristics of soccer's promotion/relegation leagues where successful teams rise to higher leagues and unsuccessful teams fall to lower leagues. He attributed the higher degree of competitive balance that is generally found in English Soccer to these characteristics, and concluded that because league membership is not fixed, teams do not have monopoly control over their territories.

There have also been an extensive amount of studies done on factors contributing to the changes in competitive balance of NCAA football. Bennett and Fizel (1995) tested the winning percentages of all nine Division I football conferences to determine the outcome of the Supreme Court decision to terminate NCAA control of college football telecasts. They found that on average competitive balance increased after the individual schools were granted property rights to college football telecasts. Sutter and Winkler (2003) studied the effects of changes in NCAA scholarship limits on competitive balance in college football. They measured changes in parity by comparing levels of competitive balance from periods after scholarship limits were implemented to periods prior to implementation. They also took into account other changes that could have led to less balance, thus offsetting the effect of scholarship limits, by including dummy variables into their calculations. Their research has led them to conclude that current scholarship limits have not produced greater parity.

Eckard (1998) tested the effect of the lack of NCAA cartel enforcement on college football on the basis that the economic theory of cartels suggests that one consequence may be reduced competitive balance. He developed a hypothesis that NCAA regulations inhibit the improvement of weaker programs and protect the more successful programs from competition. To test this hypothesis, he used data on national rankings and standings of major football conferences from the 1920's to 1995. He took measurements of competitive balance on a conference level using the variances of time and cumulative won-lost percentages across conference members, as well as on a national level using the HHI. The evidence from his tests suggests that balance has progressively worsened since the mid-1950s, corresponding to a trend toward more extensive regulation, tighter enforcement, and harsher penalties.

Depken and Wilson (2004) conducted another study on the effects of NCAA regulatory changes in Division I college football. For each year from 1888 to 2001, they calculated performance points for each team, where two points were allotted for each victory and one point for each tie, and the market share of those performance points for each team. They then calculated the HHI and dHHI for performance points for each year by using the market shares. The institutional changes they sought to investigate were the initial formation of the NCCA, the Sanity Code, the creation of a credible enforcement mechanism, minimum high-school GPA requirements, relegation of many schools to Division I-AA status, and the creation of the Bowl Championship Series system. They also find that increased NCAA regulations and enforcement has caused Division I-A football to become less balanced.

Effects of Changes in Competitive Balance

An appropriate level of competitive balance is determined by the preferences of fans. The issue of how competitive balance affects attendance has often been discussed in literature. Fan interest, in general, is directly related to the uncertainty of how a sporting event will end. Schmidt and Berri (2001) examined the relationship between competitive balance and attendance in the case of Major League Baseball. In their study, they confirmed that league competitive balance had a significant impact on league attendance. In other words, attendance rose when competitive balance improved, thus proving that fans observe a greater interest for contests that they cannot predict the outcome of. Fan interest and attendance is incredibly important to sports leagues and teams because they are directly related to how much revenue that league or team generates. If fans lose interest in sports, they will no longer purchase tickets to see the games, spend money on merchandise, or watch games on television. Without competitive balance, the demand for sports will eventually cease to exist.

ANALYSIS

In this study I attempted to measure competitive balance in NCAA sports with two different types of methods. I used the dHHI in accordance with Depken (1999) to measure parity for twelve different sports across each of the three divisions. I also measured the standard deviation for five sports in four Division I conferences dating back to the time that they became stable.

Frequency of Championships

For my first study, I found the lists of championship winners for a select group of sports across the three divisions from 1982 to the present. I then found the frequency of those championships for each team in a sport to determine the share of total championships for each team. I summed the squares of those shares to get the HHI (equation 4) for each sport, then subtracted the ideal HHI (equation 5) to get the dHHI (equation 6). I obtained the data in this study from the history pages of the various sports on the NCAA fan website.[1] The observations in this study can be found in Tables A1-A3 in the Appendix.
I observed Division I sports to be the least competitively balanced with an average dHHI of 0.177. This number is considered high in comparison to the average dHHI's of the other two divisions (refer to Table II). The Division I sports with a higher dHHI than the other divisions are baseball, softball, men's and women's basketball, and women's soccer.

Division I women's soccer is the least competitively balanced sport in this study with a dHHI of 0.506. North Carolina claimed the championship for 19 out of the past 28 years, resulting in the high dHHI that I found doing this study. Division II women's field hockey also has a low competitive balance of 0.392 because Bloomsburg has won the championship 12 out of the past 20 years. Men's lacrosse for Division I and Division III are also poorly balanced with dHHIs of over 0.23. In Division I Syracuse, Johns Hopkins, and Princeton are the main competitors and Hobart and Salisbury hold the two largest shares of championships in Division III. Division I softball also has a high dHHI because of the strength of the softball programs at Arizona and UCLA. Division II women's lacrosse also has a high dHHI but the reason for that is most likely that there have only been recorded for the past 9 years and there is an average of only 35 teams.

[1] http://www.ncaa.com/

Table II: Frequency of Championships
(dHHI for selected sports in each division)

Sports	Division I	Division II	Division III
Baseball	0.105	0.082	0.076
Softball	0.245	0.064	0.106
Men's Basketball	0.066	0.062	0.061
Women's Basketball	0.150	0.100	0.058
Men's Lacrosse	0.236	0.150	0.256
Women's Lacrosse	0.155	0.231	0.185
Men's Soccer	0.122	0.086	0.109
Women's Soccer	0.506	0.109	0.116
Men's Volleyball	0.164		
Women's Volley	0.119	0.077	0.196
Football	0.073	0.097	0.166
Field Hockey	0.189	0.392	0.156
Average	0.177	0.132	0.135

Certain sports, such as men's basketball and football, have a relatively high level of competitive balance. There is very little variation in competitive balance for men's basketball in each of the divisions. All three of the dHHI measures are right in the range of 0.06 (refer to Table II). In Football, there is an increase of 0.02 in the measurement of competitive balance from Division I to Division II as well as Division II to Division III. It seems that the longer a sport has been established, the more competitively balanced that sport is able to be. Some other sports with high levels of competitive balance are baseball in all divisions, women's basketball in Division III, and softball, men's soccer and women's volleyball in Division II. In Division III women's basketball there have been 21 different champions in the past 28 years.

Dispersal of Winning Percentages

The other half of my study consists of a collection of actual and ideal standard deviations of winning percentages for five sports in four different conferences. The conferences are the Pac-10, the Big Ten, the Big 12, and the SEC. The sports are baseball, men's and women's basketball, football, and softball, (see Tables A4-A7 in the Appendix). I found the data for this study in the media guides for the various sports on each conference websites.[2]

I recorded the win/loss records for each year from the earliest stable period in each conference sport to the present, and then calculated the winning percentages across all the years and sports represented. I found the actual standard deviation of the winning percentages for each year and an ideal standard deviation based on the number of games played by each team for that season. The measurements that I use for comparison in this study are a collection of ratios of ideal to actual standard deviations. I display these

[2] http://www.bigten.org/
http://www.big12sports.com/
http://www.pac-10.org/genrel/070909aae.html
http://www.secsports.com/

ratios in three different types of tables in order to more clearly understand the data. The tables represented are as follows: a set of five tables (Tables III – VII) to compare the ratios of the four conferences in each of the five sports, a set of four tables (Tables VIII – XI) to measure the ratios of the five sports across each conference, and a table (Table XII) to measure gender differences by finding the average of the ratios of all conferences each year for men's and women's basketball, baseball and softball.

In comparing the ratios by sport, the Big 12 was the most unbalanced conference in baseball with an average ratio of 1.735. The average ratios of the Pac-10 and the SEC were almost identical. Both had ratios of 1.528 with variations found only in the lower decimal places. The Big Ten experienced two particularly balanced seasons in 1995 and 2002 where the ratios were 0.805 and 0.960, respectively. The Pac-10 also achieved two seasons with ratios below 1.0 in '06 and '08.

Table III: Dispersal of Winning Percentages in Baseball
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1991-1992	1.403			1.221
1992-1993	1.476			1.355
1993-1994	2.011			1.982
1994-1995	0.805			1.488
1995-1996	1.906			1.996
1996-1997	1.459	2.004		1.843
1997-1998	1.726	1.586		1.814
1998-1999	2.101	2.555	1.860	1.678
1999-2000	1.535	2.060	1.926	1.939
2000-2001	1.827	1.590	1.741	1.459
2001-2002	0.960	1.438	1.568	1.771
2002-2003	1.578	1.985	1.568	1.225
2003-2004	1.466	1.910	1.080	1.401
2004-2005	1.343	1.550	2.407	1.329
2005-2006	1.441	1.688	0.958	1.379
2006-2007	1.829	1.404	1.414	1.072
2007-2008	1.782	1.547	0.913	1.161
2008-2009	2.041	1.252	1.376	1.400
Average	1.594	1.736	1.528	1.529
		Overall Average		1.597

Table IV: Dispersal of Winning Percentages in Men's Basketball (Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1978-1979			1.707	
1979-1980			2.288	
1980-1981			2.266	
1981-1982			2.051	
1982-1983			2.108	
1983-1984			1.792	
1984-1985			1.772	
1985-1986			1.352	
1986-1987			1.474	
1987-1988			1.912	
1988-1989			2.534	
1989-1990			2.131	
1990-1991			1.133	
1991-1992			2.200	1.638
1992-1993	2.119		2.049	1.638
1993-1994	1.520		1.950	1.989
1994-1995	2.044		2.049	1.732
1995-1996	1.826		2.000	1.537
1996-1997	1.978	1.758	2.049	1.846
1997-1998	2.121	1.758	2.244	1.745
1998-1999	1.729	1.834	1.618	1.679
1999-2000	2.098	2.216	2.166	1.665
2000-2001	1.732	1.895	2.309	1.537
2001-2002	1.533	2.000	2.073	1.225
2002-2003	1.581	1.846	2.233	1.895
2003-2004	1.688	1.977	1.721	1.492
2004-2005	2.156	1.638	1.663	1.919
2005-2006	1.396	1.552	1.721	1.651
2006-2007	2.110	1.784	1.988	1.187
2007-2008	2.261	1.537	2.037	1.706
2008-2009	1.687	2.023	1.444	1.523
Average	1.858	1.832	1.937	1.645
		Overall Average		1.817

For men's and women's basketball, the Pac-10 proved to be the least balanced conference and the SEC the most balanced. The Pac-10 average ratios were 1.936 for men's basketball and 2.219 for women's basketball. The average ratios for the SEC were 1.644 for the men's and 1.897 for the women's teams. The Big Ten and the Big 12 had similar average ratios in men's and women's basketball. Men's basketball showed average ratios of 1.85 for the Big Ten and 1.83 for the Big 12. Women's basketball showed average ratios of 2.07 for the Big Ten and 2.00 for the Big 12.

Table V: Dispersal of Winning Percentages in Women's Basketball (Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1986-1987			2.177	
1987-1988			2.320	
1988-1989			2.120	
1989-1990			2.444	
1990-1991			2.131	
1991-1992			2.108	1.636
1992-1993	2.394		1.886	1.809
1993-1994	2.261		2.465	1.863
1994-1995	1.703		2.131	1.933
1995-1996	2.377		1.937	1.553
1996-1997	1.775	2.023	2.582	2.000
1997-1998	1.857	1.989	2.485	1.809
1998-1999	2.049	1.706	2.309	1.659
1999-2000	2.025	2.023	2.049	2.064
2000-2001	2.324	2.126	1.695	1.879
2001-2002	1.732	1.989	2.553	1.809
2002-2003	1.857	2.365	2.012	2.233
2003-2004	2.258	2.078	1.899	1.838
2004-2005	2.419	2.246	2.404	2.064
2005-2006	2.313	2.100	2.131	1.879
2006-2007	2.133	1.651	2.465	2.162
2007-2008	1.713	1.834	2.309	2.186
2008-2009	2.098	1.883	2.424	1.780
Average	2.076	2.001	2.219	1.898
			Overall Average	2.048

Of all five sports, football was the most competitively balanced sport with a total average ratio of 1.540. The Pac-10 was the football conference that showed the most competitive balance over time with an average ratio of 1.426. However, the other three conferences represented high levels of competitive balance as well with average ratios in the range of 1.56 to 1.58. Football was the only sport of the five to never experience a season with a ratio above 2.0 for all four conferences.

Table VI: Dispersal of Winning Percentages in Football
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1978-1979			1.310	
1979-1980			1.291	
1980-1981			1.267	
1981-1982			1.502	
1982-1983			1.416	
1983-1984			1.212	
1984-1985			1.528	
1985-1986			1.119	
1986-1987			1.339	
1987-1988			1.416	
1988-1989			1.456	
1989-1990			1.204	
1990-1991			1.213	
1991-1992			1.700	
1992-1993			1.302	1.466
1993-1994	1.692		1.202	1.726
1994-1995	1.368		1.333	1.712
1995-1996	1.672		1.586	1.627
1996-1997	1.732	1.679	1.491	1.651
1997-1998	1.789	1.651	1.667	1.567
1998-1999	1.789	1.651	1.700	1.859
1999-2000	1.517	1.679	1.374	1.651
2000-2001	1.140	1.784	1.528	1.414
2001-2002	1.095	1.679	1.700	1.446
2002-2003	1.789	1.567	1.453	1.606
2003-2004	1.643	1.679	1.333	1.732
2004-2005	1.517	1.446	1.700	1.624
2005-2006	1.612	1.414	1.700	1.595
2006-2007	1.789	1.243	1.227	1.567
2007-2008	1.378	1.477	1.186	1.279
2008-2009	1.483	1.679	1.757	1.477
Average	1.563	1.587	1.426	1.588
			Overall Average	1.541

Softball was the least competitively balanced sport with a total average ratio of 2.200. The most balanced conference was the Big 12 with an average ratio of 1.983, and the least balanced was the SEC with a ratio of 2.463. SEC softball had the highest average ratio of all the sports in all the conferences represented in this study and never experienced a season with ratios below 2.0. Softball was also the only sport with a season ratio over 3.0, observed in the season of 1995 by the Pac-10 conference.

Table VII: Dispersal of Winning Percentages in Softball (Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1992-1993			2.848	
1993-1994			2.968	
1994-1995			3.304	
1995-1996	2.441	2.152	2.959	
1996-1997	2.596	2.124	2.651	2.676
1997-1998	1.958	2.090	2.493	2.217
1998-1999	2.146	1.351	1.797	2.279
1999-2000	1.854	2.092	2.029	2.316
2000-2001	1.908	1.982	2.394	2.382
2001-2002	2.276	2.251	2.225	2.228
2002-2003	1.791	2.114	2.163	2.296
2003-2004	1.683	2.185	2.109	2.298
2004-2005	2.051	1.728	1.475	2.828
2005-2006	1.867	1.882	1.743	2.736
2006-2007	2.018	2.135	1.401	2.626
2007-2008	2.145	2.197	2.213	2.688
2008-2009	2.241	1.485	2.057	2.456
Average	2.070	1.983	2.284	2.464
			Overall Average	2.200

The second set of tables looked at ratios by conference. In Big Ten sports, football had the highest level of competitive balance with an average ratio of 1.562, closely followed by baseball with an average ratio of 1.593. Women's basketball was the least competitively balanced with an average ratio of 2.075, which was just slightly higher than the ratio 2.069 for softball. Big Ten women's basketball experienced ten seasons with ratios over 2.0 and baseball had two seasons with ratios below 1.0. There was also a dramatic change in competitive balance for baseball between the 1994 and 1995 seasons where ratios dropped from 2.011 to 0.805.

Table VIII: Dispersal of Winning Percentages in the Big Ten
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1991-1992	1.403				
1992-1993	1.476	2.119	2.394		
1993-1994	2.011	1.520	2.261	1.692	
1994-1995	0.805	2.044	1.703	1.368	
1995-1996	1.906	1.826	2.377	1.672	2.441
1996-1997	1.459	1.978	1.775	1.732	2.596
1997-1998	1.726	2.121	1.857	1.789	1.958
1998-1999	2.101	1.729	2.049	1.789	2.146
1999-2000	1.535	2.098	2.025	1.517	1.854
2000-2001	1.827	1.732	2.324	1.140	1.908
2001-2002	0.960	1.533	1.732	1.095	2.276
2002-2003	1.578	1.581	1.857	1.789	1.791
2003-2004	1.466	1.688	2.258	1.643	1.683
2004-2005	1.343	2.156	2.419	1.517	2.051
2005-2006	1.441	1.396	2.313	1.612	1.867
2006-2007	1.829	2.110	2.133	1.789	2.018
2007-2008	1.782	2.261	1.713	1.378	2.145
2008-2009	2.041	1.687	2.098	1.483	2.241
Average	1.594	1.858	2.076	1.563	2.070
				Overall Average	1.832

As with Big-10 sports, the Big 12 was found to be the most competitively balanced in the sport of football, which had an average ratio of 1.586, and the least in women's basketball which had an average ratio of 2.000. Baseball was also the second most balanced sport and softball was just slightly less balanced than women's basketball with an average ratio of 1.983. Baseball and men's basketball had only two seasons each with ratios of 2.0 or higher, and softball only experienced 5 of 14 seasons with ratios below 2.0.

Table IX: Dispersal of Winning Percentages in the Big 12
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1995-1996					2.152
1996-1997	2.004	1.758	2.023	1.679	2.124
1997-1998	1.586	1.758	1.989	1.651	2.090
1998-1999	2.555	1.834	1.706	1.651	1.351
1999-2000	2.060	2.216	2.023	1.679	2.092
2000-2001	1.590	1.895	2.126	1.784	1.982
2001-2002	1.438	2.000	1.989	1.679	2.251
2002-2003	1.985	1.846	2.365	1.567	2.114
2003-2004	1.910	1.977	2.078	1.679	2.185
2004-2005	1.550	1.638	2.246	1.446	1.728
2005-2006	1.688	1.552	2.100	1.414	1.882
2006-2007	1.404	1.784	1.651	1.243	2.135
2007-2008	1.547	1.537	1.834	1.477	2.197
2008-2009	1.252	2.023	1.883	1.679	1.485
Average	1.736	1.832	2.001	1.587	1.983
				Overall Average	1.828

Pac-10 sports are on average the least competitively balanced of all the conferences with a total average ratio of 1.878. Again football is the sport shown to be the most balanced with an average ratio of 1.426, followed by baseball with an average of 1.528. However, in the Pac-10 the least competitively balanced sports are softball and then women's basketball with respective ratios of 2.283 and 2.219. Women's basketball and softball achieved only four seasons each with ratios below 2.0. Baseball also had two seasons with ratios below 1.0 and only one season with a ratio above 2.0. In baseball there was also a large increase in competitive balance from the 2005 to 2006 seasons where ratios fell from 2.406 to 0.958. Softball's first six seasons were considerably unbalanced with average ratios of over 2.5.

Table X: Dispersal of Winning Percentages in the Pac-10
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1978-1979		1.707		1.310	
1979-1980		2.288		1.291	
1980-1981		2.266		1.267	
1981-1982		2.051		1.502	
1982-1983		2.108		1.416	
1983-1984		1.792		1.212	
1984-1985		1.772		1.528	
1985-1986		1.352		1.119	
1986-1987		1.474	2.177	1.339	
1987-1988		1.912	2.320	1.416	
1988-1989		2.534	2.120	1.456	
1989-1990		2.131	2.444	1.204	
1990-1991		1.133	2.131	1.213	
1991-1992		2.200	2.108	1.700	
1992-1993		2.049	1.886	1.302	2.848
1993-1994		1.950	2.465	1.202	2.968
1994-1995		2.049	2.131	1.333	3.304
1995-1996		2.000	1.937	1.586	2.959
1996-1997		2.049	2.582	1.491	2.651
1997-1998		2.244	2.485	1.667	2.493
1998-1999	1.860	1.618	2.309	1.700	1.797
1999-2000	1.926	2.166	2.049	1.374	2.029
2000-2001	1.741	2.309	1.695	1.528	2.394
2001-2002	1.568	2.073	2.553	1.700	2.225
2002-2003	1.568	2.233	2.012	1.453	2.163
2003-2004	1.080	1.721	1.899	1.333	2.109
2004-2005	2.407	1.663	2.404	1.700	1.475
2005-2006	0.958	1.721	2.131	1.700	1.743
2006-2007	1.414	1.988	2.465	1.227	1.401
2007-2008	0.913	2.037	2.309	1.186	2.213
2008-2009	1.376	1.444	2.424	1.757	2.057
Average	1.528	1.937	2.219	1.426	2.284
				Overall Average	1.879

The SEC was the conference with the lowest total average ratio of 1.824 despite the repeatedly high average ratios of softball. Baseball was the most balanced sport in this conference with an average ratio of 1.528, followed by football which had an average ratio of 1.588. Softball was clearly the least competitively balanced sport with all season ratios of well over 2.0 and an average ratio of 2.463. The season ratios for baseball, men's basketball, and football were all below the 2.0 level. Women's basketball also saw an average ratio that was below 2.0.

Table XI: Dispersal of Winning Percentages in the SEC
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1991-1992	1.221	1.638	1.636		
1992-1993	1.355	1.638	1.809	1.466	
1993-1994	1.982	1.989	1.863	1.726	
1994-1995	1.488	1.732	1.933	1.712	
1995-1996	1.996	1.537	1.553	1.627	
1996-1997	1.843	1.846	2.000	1.651	2.676
1997-1998	1.814	1.745	1.809	1.567	2.217
1998-1999	1.678	1.679	1.659	1.859	2.279
1999-2000	1.939	1.665	2.064	1.651	2.316
2000-2001	1.459	1.537	1.879	1.414	2.382
2001-2002	1.771	1.225	1.809	1.446	2.228
2002-2003	1.225	1.895	2.233	1.606	2.296
2003-2004	1.401	1.492	1.838	1.732	2.298
2004-2005	1.329	1.919	2.064	1.624	2.828
2005-2006	1.379	1.651	1.879	1.595	2.736
2006-2007	1.072	1.187	2.162	1.567	2.626
2007-2008	1.161	1.706	2.186	1.279	2.688
2008-2009	1.400	1.523	1.780	1.477	2.456
Average	1.529	1.645	1.898	1.588	2.464
				Overall Average	1.825

In comparing ratios by gender, I decided to exclude football as it did not correspond to a comparable women's sport. Baseball was the most balanced sport with a total average of all four conferences of 1.593. Baseball only saw one season in which the average of the four conference ratios was over 2.0. There was about 0.7 point difference between baseball and its sister sport, softball, which had the highest total average ratio of 2.315. It was only in the 1999 season that the average of the four conference ratios for softball dropped below 2.0. Interestingly, it was in this same season that the average of conference ratios rose above 2.0. The difference between men's and women's basketball is not as great, with the men's ratio at 1.854 and women's at 2.086. There were only three seasons where the average of the four conference ratios for women's basketball was less than men's.

Upon completion of this part of the study I have come to the conclusion that men's sports overall show more competitive balance than women's sports. I base this conclusion on the evidence shown in the comparisons of the ratios of these five different sports.

Table XII: Dispersal of Winning Percentages in Gender
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball Averages	Softball Averages	Men's Basketball Averages	Women's Basketball Averages
1978-1979			1.707	
1979-1980			2.288	
1980-1981			2.266	
1981-1982			2.051	
1982-1983			2.108	
1983-1984			1.792	
1984-1985			1.772	
1985-1986			1.352	
1986-1987			1.474	2.177
1987-1988			1.912	2.320
1988-1989			2.534	2.120
1989-1990			2.131	2.444
1990-1991			1.133	2.131
1991-1992	1.312		1.919	1.872
1992-1993	1.416	2.848	1.935	2.030
1993-1994	1.997	2.968	1.820	2.196
1994-1995	1.146	3.304	1.942	1.922
1995-1996	1.951	2.517	1.788	1.956
1996-1997	1.769	2.512	1.908	2.095
1997-1998	1.709	2.190	1.967	2.035
1998-1999	2.048	1.893	1.715	1.931
1999-2000	1.865	2.073	2.036	2.040
2000-2001	1.654	2.166	1.868	2.006
2001-2002	1.434	2.245	1.708	2.021
2002-2003	1.589	2.091	1.889	2.117
2003-2004	1.464	2.069	1.720	2.018
2004-2005	1.657	2.020	1.844	2.283
2005-2006	1.367	2.057	1.580	2.106
2006-2007	1.430	2.045	1.767	2.103
2007-2008	1.351	2.311	1.885	2.011
2008-2009	1.517	2.060	1.669	2.046
Total Average	1.593	2.316	1.854	2.086

CONCLUSIONS

The observations I have made throughout this study have lead me to draw two basic conclusions about variations of competitive balance in NCAA sports. Firstly, I have found evidence to show that Division I sports on average have less competitive balance than Division II or Division III. The simplest explanation for this is the presence of cartel effects in Division I. Regulations and restrictions put on sports by the NCAA often benefit the strong teams because they do not allow for growth of the weaker teams. It is also the case that successful, high ranking conferences have the incentive to collude against possible future competition in other conferences. Those strong conferences often earn high revenues and are often concerned with protecting their revenues.

My second conclusion is that men's sports are typically more balanced than women's sports. The explanation for this is possibility the occurrence of life cycle effects in competitive balance. Men's sports are more mature and established than women's sports, thus leading to more stability in the parity of the sport. Possible future research on this topic could explore the progression of competitive balance through time for men's sports in order to prove the existence of life cycle effects in competitive balance.

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APPENDIX

Table A1: NCAA Division I Championship Winners

Academic Year	Baseball	Basketball (M.)	Basketball (W.)	Field Hockey	Football	Lacrosse (M.)	Lacrosse (W.)	Soccer (M.)	Soccer (W.)	Softball	Volleyball (M.)	Volleyball (W.)
1981-1982	Miami (Fla.)	North Carolina	Louisiana Tech	Old Dominion	Penn St.	North Carolina	Massachusetts	Indiana	North Carolina	UCLA	UCLA	Hawaii
1982-1983	Texas	North Carolina St.	Southern California	Old Dominion	Miami (Fla.)	Syracuse	Delaware	Indiana	North Carolina	Texas A&M	UCLA	Hawaii
1983-1984	Cal St. Fullerton	Georgetown	Southern California	Old Dominion	Brigham Young	Johns Hopkins	Temple	Clemson	North Carolina	UCLA	UCLA	UCLA
1984-1985	Miami (Fla.)	Villanova	Old Dominion	Connecticut	Oklahoma	Johns Hopkins	New Hampshire	UCLA	George Mason	UCLA	Pepperdine	Pacific
1985-1986	Arizona	Louisville	Texas	Iowa	Penn St.	North Carolina	Maryland	Duke	North Carolina	Cal St. Fullerton	Pepperdine	Pacific
1986-1987	Stanford	Indiana	Tennessee	Maryland	Miami (Fla.)	Johns Hopkins	Penn St.	Clemson	North Carolina	Texas A&M	UCLA	Hawaii
1987-1988	Stanford	Kansas	Louisiana Tech	Old Dominion	Notre Dame	Syracuse	Temple	Indiana	North Carolina	UCLA	Southern California	Texas
1988-1989	Wichita St.	Michigan	Tennessee	North Carolina	Miami (Fla.)	Syracuse	Penn St.	Santa Clara, Virginia	North Carolina	UCLA	UCLA	Long Beach St.
1989-1990	Georgia	UNLV	Stanford	Old Dominion	Georgia Tech	Syracuse	Harvard	UCLA	North Carolina	UCLA	Southern California	UCLA
1990-1991	LSU	Duke	Tennessee	Old Dominion	Miami (Fla.)	North Carolina	Virginia	Virginia	North Carolina	Arizona	Long Beach St.	
1991-1992	Pepperdine	Duke	Stanford	Old Dominion	Alabama	Princeton	Maryland	Virginia	North Carolina	UCLA	Pepperdine	Stanford
1992-1993	LSU	North Carolina	Texas Tech	Maryland	Florida State	Syracuse	Virginia	Virginia	North Carolina	Arizona	UCLA	Long Beach St.
1993-1994	Oklahoma	Arkansas	North Carolina	James Madison	Nebraska	Princeton	Princeton	Virginia	North Carolina	Arizona	Penn St.	Stanford
1994-1995	Cal St. Fullerton	UCLA	Connecticut	North Carolina	Nebraska	Syracuse	Maryland	Wisconsin	Notre Dame	UCLA	UCLA	Nebraska
1995-1996	LSU	Kentucky	Tennessee	North Carolina	Florida	Princeton	Maryland	St. John's (N.Y.)	North Carolina	Arizona	UCLA	Stanford
1996-1997	LSU	Arizona	Tennessee	North Carolina	Michigan	Princeton	Maryland	UCLA	North Carolina	Arizona	Stanford	Stanford
1997-1998	Southern California	Kentucky	Tennessee	Old Dominion	Tennessee	Princeton	Maryland	Indiana	Florida	Fresno St.	UCLA	Long Beach St.
1998-1999	Miami (Fla.)	Connecticut	Purdue	Maryland	Florida State	Virginia	Maryland	Indiana	North Carolina	UCLA	Brigham Young	Penn St.
1999-2000	LSU	Michigan St.	Connecticut	Old Dominion	Oklahoma	Syracuse	Maryland	Connecticut	North Carolina	Oklahoma	UCLA	Nebraska
2000-2001	Miami (Fla.)	Duke	Notre Dame	Michigan	Miami (Fla.)	Princeton	Maryland	North Carolina	Santa Clara	Arizona	Brigham Young	Stanford
2001-2002	Texas	Maryland	Connecticut	Wake Forest	Ohio State	Syracuse	Princeton	UCLA	Portland	California	Hawaii	Southern California
2002-2003	Rice	Syracuse	Connecticut	Wake Forest	Louisiana State	Virginia	Princeton	Indiana	North Carolina	UCLA	Lewis	Southern California
2003-2004	Cal St. Fullerton	Connecticut	Connecticut	Wake Forest	Southern California	Syracuse	Virginia	Indiana	Notre Dame	UCLA	Brigham Young	Stanford
2004-2005	Texas	North Carolina	Baylor	Maryland	Texas	Johns Hopkins	Northwestern	Maryland	Portland	Michigan	Pepperdine	Washington
2005-2006	Oregon St.	Florida	Maryland	Maryland	Florida	Virginia	Northwestern	UC Santa Barb.	North Carolina	Arizona	UCLA	Nebraska
2006-2007	Oregon St.	Florida	Tennessee	North Carolina	Louisiana State	Johns Hopkins	Northwestern	Wake Forest	Southern California	Arizona	UC Irvine	Penn St.
2007-2008	Fresno St.	Kansas	Tennessee	Maryland	Florida	Syracuse	Northwestern	Maryland	North Carolina	Arizona St.	Penn St.	Penn St.
2008-2009		North Carolina	Connecticut				Northwestern			Washington	UC Irvine	

Table A2: NCAA Division II Championship Winners

Academic Year	Baseball	Basketball (M.)	Basketball (W.)	Field Hockey	Football	Lacrosse (M.)	Lacrosse (W.)	Soccer (M.)	Soccer (W.)	Softball	Volleyball (W.)
1981-1982	UC Riverside	Dist. Columbia	Cal Poly Pomona	Lock Haven	Texas St.			Florida Int'l		Sam Houston St.	UC Riverside
1982-1983	Cal Poly Pomona	Wright St.	Virginia Union	Bloomsburg	North Dakota St.			Seattle Pacific		Cal St. Northridge	Cal St. Northridge
1983-1984	Cal St. Northridge	Central Mo.	Central Mo.		Troy St.			Florida Int'l		Cal St. Northridge	Portland St.
1984-1985	Fla. Southern	Jacksonville St.	Cal Poly Pomona		North Dakota St.			Seattle Pacific		Cal St. Northridge	Portland St.
1985-1986	Troy	Sacred Heart	Cal Poly Pomona		North Dakota St.			Seattle Pacific		Stephen F. Austin	UC Riverside
1986-1987	Troy	Ky. Wesleyan	New Haven		Troy St.			Southern Conn. St.		Cal St. Northridge	Cal St. Northridge
1987-1988	Fla. Southern	Mass.-Lowell	Hampton		North Dakota St.			Florida Tech	Cal St. East Bay	Cal St. Bakersfield	Portland St.
1988-1989	Cal Poly	N.C. Central	Delta St.		Mississippi Col.			Southern N.H.	Barry	Cal St. Bakersfield	Cal St. Bakersfield
1989-1990	Jacksonville St.	Ky. Wesleyan	Delta St.		North Dakota St.			Southern Conn. St.	Sonoma St.	Cal St. Bakersfield	
1990-1991	Jacksonville St.	North Ala.	North Dakota St.		Pittsburg St.			Florida Tech	Cal St. Dom. Hills	Augustana (S.D.)	West Tex. A&M
1991-1992	Tampa	Virginia Union	Delta St.	Lock Haven	Jacksonville St.			Southern Conn. St.	Barry	Mo. Southern St.	Portland St.
1992-1993	Tampa	Cal St. Bakersfield	North Dakota St.	Bloomsburg	North Ala.	Adelphi		Seattle Pacific	Barry	Fla. Southern	Northern Mich.
1993-1994	Central Mo. St.	Cal St. Bakersfield	North Dakota St.	Lock Haven	North Ala.	Springfield		Tampa	Franklin Pierce	Merrimack	Northern Mich.
1994-1995	Fla. Southern	Southern Ind.	North Dakota St.	Lock Haven	North Ala.	Adelphi		Southern Conn. St.	Franklin Pierce	Kennesaw St.	Barry
1995-1996	Kennesaw St.	Fort Hays St.	North Dakota St.	Bloomsburg	Northern Colo.	C.W. Post		Grand Canyon	Franklin Pierce	Kennesaw St.	Neb.-Omaha
1996-1997	Cal St. Chico	Cal St. Bakersfield	North Dakota	Bloomsburg	Northern Colo.	NYIT		Cal St. Bakersfield	Franklin Pierce	California (Pa.)	West Tex. A&M
1997-1998	Tampa	UC Davis	North Dakota	Bloomsburg	Northwest Mo. St.	Adelphi		Southern Conn. St.	Lynn	California (Pa.)	Hawaii Pacific
1998-1999	Cal St. Chico	Ky. Wesleyan	North Dakota	Bloomsburg	Northwest Mo. St.	Adelphi		Southern Conn. St.	Franklin Pierce	Humboldt St.	BYU-Hawaii
1999-2000	Southeastern Okla.	Metro St.	Northern Ky.	Lock Haven	Delta St.	Limestone		Cal St. Dom. Hills	UC San Diego	North Dakota St.	Hawaii Pacific
2000-2001	St. Mary's (Tex.)	Ky. Wesleyan	Cal Poly Pomona	Bentley	North Dakota St.	Adelphi	C.W. Post	Tampa	UC San Diego	Neb.-Omaha	Barry
2001-2002	Columbus St.	Metro St.	Cal Poly Pomona	Bloomsburg	Grand Valley St.	Limestone	West Chester	Sonoma St.	Christian Bros.	St. Mary's (Tex.)	BYU-Hawaii
2002-2003	Central Mo. St.	Northeastern St.	South Dakota St.	Bloomsburg	Grand Valley St.	NYITM	Stonehill	Lynn	Kennesaw St.	UC Davis	North Ala.
2003-2004	Delta St.	Kennesaw St.	California (Pa.)	Bloomsburg	Valdosta St.	Le Moyne	Adelphi	Seattle	Metro St.	Angelo St.	Barry
2004-2005	Fla. Southern	Virginia Union	Washburn	Mass.-Lowell	Grand Valley St.	NYIT	Stonehill	Fort Lewis	Neb.-Omaha	Lynn	Grand Valley State
2005-2006	Tampa	Winona St.	Grand Valley St.	Bloomsburg	Grand Valley St.	Le Moyne	Adelphi	Dowling	Metro St.	Lock Haven	Tampa
2006-2007	Tampa	Barton	Southern Conn. St.	Bloomsburg	Valdosta St.	Le Moyne	C.W. Post	Franklin Pierce	Tampa	SIU Edwardsville	Concordia-St. Paul
2007-2008	Mount Olive	Winona St.	Northern Ky.	Bloomsburg	Minn.-Duluth	NYIT	West Chester	Cal St. Dom. Hills	Seattle Pacific	Humboldt St.	Concordia-St. Paul
2008-2009	Lynn	Findlay	Minn. St. Mankato			C.W. Post	Adelphi			Lock Haven	

Table A3: NCAA Division III Championship Winners

Academic Year	Baseball	Basketball (M.)	Basketball (W.)	Field Hockey	Football	Lacrosse (M.)	Lacrosse (W.)	Soccer (M.)	Soccer (W.)	Softball	Volleyball (W.)
1981-1982	Eastern Conn. St.	Wabash	Elizabethtown	Ithaca	Augustana (Ill.)	Hobart		UNC Greensboro		Eastern Conn. St.	La Verne
1982-1983	Marietta	Scranton	North Central (Ill.)	TCNJ	Augustana (Ill.)	Hobart		UNC Greensboro		TCNJ	Elmhurst
1983-1984	Ramapo	Wis.-Whitewater	Rust	Bloomsburg	Augustana (Ill.)	Hobart		Wheaton (Ill.)		Buena Vista	UC San Diego
1984-1985	Wis.-Oshkosh	North Park	Scranton	TCNJ	Augustana (Ill.)	Hobart	TCNJ	UNC Greensboro		Eastern Conn. St.	Elmhurst
1985-1986	Marietta	SUNY Potsdam	Salem St.	Salisbury	Wagner	Hobart	Ursinus	UNC Greensboro	Rochester	Eastern Conn. St.	UC San Diego
1986-1987	Montclair St.	North Park	Wis.-Stevens Point	Bloomsburg	Ithaca	Hobart	TCNJ	UNC Greensboro	Rochester	TCNJ	UC San Diego
1987-1988	Ithaca	Ohio Wesleyan	Concordia-M'head	TCNJ	Dayton	Hobart	TCNJ	UC San Diego	William Smith	Central (Iowa)	UC San Diego
1988-1989	N.C. Wesleyan	Wis.-Whitewater	Elizabethtown	Lock Haven	Allegheny	Hobart	Ursinus	Elizabethtown	UC San Diego	TCNJ	Washington-St. Louis
1989-1990	Eastern Conn. St.	Rochester	Hope	TCNJ	Ithaca	Hobart	Ursinus	Rowan	Ithaca	Eastern Conn. St.	UC San Diego
1990-1991	Southern Me.	Wis.-Platteville	St. Thomas (Minn.)	TCNJ	Wis.-La Crosse	Hobart	TCNJ	UC San Diego	Ithaca	Central (Iowa)	Washington-St. Louis
1991-1992	Wm. Paterson	Calvin	Alma	William Smith	Mount Union	Nazareth	TCNJ	Kean	Cortland St.	TCNJ	Washington-St. Louis
1992-1993	Montclair St.	Ohio Northern	Central (Iowa)	Cortland St.	Albion	Hobart	TCNJ	UC San Diego	TCNJ	Central (Iowa)	Washington-St. Louis
1993-1994	Wis.-Oshkosh	Lebanon Valley	Capital	Cortland St.	Wis.-La Crosse	Salisbury	TCNJ	Bethany (W.V.)	TCNJ	TCNJ	Washington-St. Louis
1994-1995	La Verne	Wis.-Platteville	Capital	TCNJ	Mount Union	Salisbury	TCNJ	Williams	UC San Diego	Chapman	Washington-St. Louis
1995-1996	Wm. Paterson	Rowan	Wis.-Oshkosh	TCNJ	Mount Union	Nazareth	TCNJ	TCNJ	UC San Diego	TCNJ	Washington-St. Louis
1996-1997	Southern Me.	Ill. Wesleyan	New York U.	William Smith	Mount Union	Nazareth	Middlebury	Wheaton (Ill.)	UC San Diego	Simpson	UC San Diego
1997-1998	Eastern Conn. St.	Wis.-Platteville	Washington-St. Louis	Middlebury	Pacific Lutheran	Washington (Md.)	TCNJ	Ohio Wesleyan	Macalester	Wis.-Stevens Point	Central (Iowa)
1998-1999	N.C. Wesleyan	Wis.-Platteville	Washington-St. Louis	TCNJ	Mount Union	Salisbury	Middlebury	St. Lawrence	UC San Diego	Simpson	Central (Iowa)
1999-2000	Montclair St.	Calvin	Washington-St. Louis	William Smith	Mount Union	Middlebury	TCNJ	Messiah	TCNJ	St. Mary's (Minn.)	Central (Iowa)
2000-2001	St. Thomas (Minn.)	Catholic	Washington-St. Louis	Cortland St.	Mount Union	Middlebury	Middlebury	Richard Stockton	Ohio Wesleyan	Muskingum	La Verne
2001-2002	Eastern Conn. St.	Otterbein	Wis.-Stevens Point	Rowan	St. John's (Minn.)	Middlebury	Middlebury	Messiah	Ohio Wesleyan	Ithaca	Wis.-Whitewater
2002-2003	Chapman	Williams	Trinity (Tex.)	Salisbury	Linfield	Salisbury	Amherst	Trinity (Tex.)	Oneonta St.	Central (Iowa)	Washington-St. Louis
2003-2004	George Fox	Wis.-Stevens Point	Wilmington (Ohio)	Salisbury	Mount Union	Salisbury	Middlebury	Messiah	Wheaton (Ill.)	St. Thomas (Minn.)	Juniata
2004-2005	Wis.-Whitewater	Wis.-Stevens Point	Millikin	Salisbury	Mount Union	Salisbury	TCNJ	Messiah	Messiah	St. Thomas (Minn.)	Wis.-Whitewater
2005-2006	Marietta	Va. Wesleyan	Hope	Ursinus	Wis.-Whitewater	Cortland State	TCNJ	Messiah	Wheaton (Ill.)	Rutgers-Camden	Juniata
2006-2007	Kean	Amherst	DePauw	Bowdoin	Mount Union	Salisbury	Franklin & Marshall	Middlebury	Wheaton (Ill.)	Linfield	Washington-St. Louis
2007-2008	Trinity (Conn.)	Washington-St. Louis	Howard Payne	Bowdoin		Salisbury	Hamilton	Messiah	Messiah	Wis.-Eau Claire	Emory
2008-2009	St. Thomas (Minn.)	Washington-St. Louis	George Fox			Cortland State	Franklin & Marshall			Messiah	

Table A4: Big Ten

	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
Academic Year	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal
1991-1992	0.133	0.094								
1992-1993	0.141	0.096	0.250	0.118	0.282	0.118				
1993-1994	0.191	0.095	0.179	0.118	0.266	0.118	0.299	0.177		
1994-1995	0.077	0.095	0.241	0.118	0.213	0.125	0.242	0.177		
1995-1996	0.183	0.096	0.215	0.118	0.297	0.125	0.296	0.177	0.251	0.103
1996-1997	0.142	0.097	0.233	0.118	0.222	0.125	0.306	0.177	0.272	0.105
1997-1998	0.169	0.098	0.265	0.125	0.232	0.125	0.316	0.177	0.202	0.103
1998-1999	0.200	0.095	0.216	0.125	0.256	0.125	0.316	0.177	0.221	0.103
1999-2000	0.146	0.095	0.262	0.125	0.253	0.125	0.268	0.177	0.226	0.122
2000-2001	0.178	0.098	0.217	0.125	0.290	0.125	0.202	0.177	0.213	0.112
2001-2002	0.088	0.092	0.192	0.125	0.217	0.125	0.194	0.177	0.270	0.118
2002-2003	0.143	0.090	0.198	0.125	0.232	0.125	0.316	0.177	0.209	0.117
2003-2004	0.130	0.089	0.211	0.125	0.282	0.125	0.290	0.177	0.189	0.112
2004-2005	0.121	0.090	0.270	0.125	0.302	0.125	0.268	0.177	0.239	0.117
2005-2006	0.128	0.089	0.175	0.125	0.289	0.125	0.285	0.177	0.217	0.116
2006-2007	0.167	0.091	0.264	0.125	0.267	0.125	0.316	0.177	0.248	0.123
2007-2008	0.159	0.090	0.266	0.118	0.202	0.118	0.244	0.177	0.244	0.114
2008-2009	0.210	0.103	0.199	0.118	0.247	0.118	0.262	0.177	0.252	0.112

Table A5: Big 12

	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
Academic Year	**Sdwin**	**Sdideal**	**Sdwin**	**Sdideal**	**Sdwin**	**Sdideal**	**Sdwin**	**Sdideal**	**Sdwin**	**Sdideal**
1995-1996									0.238	0.110
1996-1997	0.185	0.092	0.220	0.125	0.253	0.125	0.297	0.177	0.267	0.126
1997-1998	0.150	0.095	0.220	0.125	0.249	0.125	0.292	0.177	0.257	0.123
1998-1999	0.241	0.094	0.229	0.125	0.213	0.125	0.292	0.177	0.173	0.128
1999-2000	0.190	0.092	0.277	0.125	0.253	0.125	0.297	0.177	0.249	0.119
2000-2001	0.148	0.093	0.237	0.125	0.266	0.125	0.315	0.177	0.242	0.122
2001-2002	0.140	0.097	0.250	0.125	0.249	0.125	0.297	0.177	0.268	0.119
2002-2003	0.192	0.097	0.231	0.125	0.296	0.125	0.277	0.177	0.251	0.119
2003-2004	0.187	0.098	0.247	0.125	0.260	0.125	0.297	0.177	0.263	0.121
2004-2005	0.150	0.097	0.205	0.125	0.281	0.125	0.256	0.177	0.205	0.119
2005-2006	0.164	0.097	0.194	0.125	0.262	0.125	0.250	0.177	0.224	0.119
2006-2007	0.139	0.099	0.223	0.125	0.206	0.125	0.220	0.177	0.254	0.119
2007-2008	0.149	0.097	0.192	0.125	0.229	0.125	0.261	0.177	0.260	0.119
2008-2009	0.122	0.097	0.253	0.125	0.235	0.125	0.297	0.177	0.176	0.119

Table A6: Pac-10

	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
Academic Year	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal
1978-1979			0.201	0.118			0.241	0.184		
1979-1980			0.270	0.118			0.240	0.186		
1980-1981			0.267	0.118			0.236	0.186		
1981-1982			0.242	0.118			0.276	0.184		
1982-1983			0.248	0.118			0.264	0.186		
1983-1984			0.211	0.118			0.229	0.189		
1984-1985			0.221	0.125			0.277	0.181		
1985-1986			0.159	0.118			0.200	0.179		
1986-1987			0.174	0.118	0.257	0.118	0.243	0.181		
1987-1988			0.225	0.118	0.273	0.118	0.271	0.192		
1988-1989			0.299	0.118	0.250	0.118	0.268	0.184		
1989-1990			0.251	0.118	0.288	0.118	0.221	0.184		
1990-1991			0.134	0.118	0.251	0.118	0.220	0.181		
1991-1992			0.259	0.118	0.248	0.118	0.300	0.177		
1992-1993			0.241	0.118	0.222	0.118	0.233	0.179	0.307	0.108
1993-1994			0.230	0.118	0.290	0.118	0.212	0.177	0.307	0.103
1994-1995			0.241	0.118	0.251	0.118	0.236	0.177	0.312	0.094
1995-1996			0.236	0.118	0.228	0.118	0.280	0.177	0.289	0.098
1996-1997			0.241	0.118	0.304	0.118	0.264	0.177	0.253	0.095
1997-1998			0.264	0.118	0.293	0.118	0.295	0.177	0.238	0.095
1998-1999	0.190	0.102	0.191	0.118	0.272	0.118	0.300	0.177	0.171	0.095
1999-2000	0.197	0.102	0.255	0.118	0.241	0.118	0.243	0.177	0.223	0.110
2000-2001	0.180	0.103	0.272	0.118	0.200	0.118	0.270	0.177	0.263	0.110
2001-2002	0.160	0.102	0.244	0.118	0.301	0.118	0.300	0.177	0.243	0.109
2002-2003	0.160	0.102	0.263	0.118	0.237	0.118	0.257	0.177	0.236	0.109
2003-2004	0.110	0.102	0.203	0.118	0.224	0.118	0.236	0.177	0.233	0.110
2004-2005	0.246	0.102	0.196	0.118	0.283	0.118	0.300	0.177	0.161	0.109
2005-2006	0.098	0.103	0.203	0.118	0.251	0.118	0.300	0.177	0.191	0.110
2006-2007	0.144	0.102	0.234	0.118	0.290	0.118	0.205	0.167	0.154	0.110
2007-2008	0.093	0.102	0.240	0.118	0.272	0.118	0.198	0.167	0.241	0.109
2008-2009	0.132	0.096	0.170	0.118	0.286	0.118	0.293	0.167	0.226	0.110

Table A7: SEC

	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
Academic Year	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal
1991-1992	0.126	0.103	0.249	0.125	0.247	0.151				
1992-1993	0.130	0.096	0.249	0.125	0.273	0.151	0.259	0.177		
1993-1994	0.191	0.096	0.205	0.125	0.281	0.151	0.305	0.177		
1994-1995	0.142	0.095	0.217	0.125	0.291	0.151	0.303	0.177		
1995-1996	0.185	0.093	0.192	0.125	0.234	0.151	0.288	0.177		
1996-1997	0.169	0.092	0.231	0.125	0.289	0.144	0.292	0.177	0.257	0.096
1997-1998	0.169	0.093	0.218	0.125	0.242	0.134	0.277	0.177	0.210	0.095
1998-1999	0.154	0.092	0.210	0.125	0.222	0.134	0.329	0.177	0.211	0.093
1999-2000	0.181	0.093	0.208	0.125	0.276	0.134	0.292	0.177	0.220	0.095
2000-2001	0.133	0.091	0.192	0.125	0.251	0.134	0.250	0.177	0.222	0.093
2001-2002	0.164	0.092	0.153	0.125	0.242	0.134	0.256	0.177	0.207	0.093
2002-2003	0.112	0.092	0.237	0.125	0.298	0.134	0.284	0.177	0.212	0.092
2003-2004	0.128	0.091	0.187	0.125	0.246	0.134	0.306	0.177	0.212	0.092
2004-2005	0.122	0.092	0.240	0.125	0.276	0.134	0.287	0.177	0.261	0.092
2005-2006	0.126	0.092	0.206	0.125	0.251	0.134	0.282	0.177	0.251	0.092
2006-2007	0.100	0.093	0.148	0.125	0.289	0.134	0.277	0.177	0.249	0.095
2007-2008	0.107	0.092	0.213	0.125	0.292	0.134	0.226	0.177	0.257	0.095
2008-2009	0.128	0.092	0.190	0.125	0.238	0.134	0.261	0.177	0.239	0.097