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The Influence of the Bowl Championship Series on Competitive Balance in College Football

Editor's Choice Award

Stephen W. Dittmore & Craig M. Crow

KEYWORDS:

NCAA, Bowl Championship Series, intercollegiate athletics, college football, competitive balance, Herfindahl-Hirschman Index, bowl games, college conferences

ABSTRACT

Competitive balance in sport has been identified as a predictor of demand for sporting events, and leagues. Conferences frequently seek to maximize outcome uncertainty as a means of increasing demand. While competitive balance was not initially a goal of the Bowl Championship Series (BCS), competitive balance in American college football has generally been regarded as improved since the implementation of the BCS. The present study confirms empirically that within-season competitive balance inside all six founding BCS conferences has improved since its creation. However, only three of the six conferences exhibited improved between-season competitive balance, meaning frequent turnover of championship teams was not observed in all conferences. Potential implications for these findings and their impact on college football are discussed.

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Scholars in sport marketing and sport economics regularly cite the importance of the uncertainty of outcome as a unique factor in the sport product, and one which helps dictate demand for the sport product (Rein, Kotler, & Shields, 2006). Spectators would be less inclined to purchase tickets to an event whose outcome was almost certain. As a result, sport leagues and governing bodies often take measures to ensure a level of competitive balance exists within their leagues or bodies.

Humphreys (2002, p. 133) stated competitive balance was "thought to be an important determination of demand for sporting events" because it reflects uncertainty about the outcome. Theoretically, less certain the outcome of a particular event, the greater the interest or demand for that event.

College football in the United States dates back to the 1800s and was initially organized and operated by students. As a result,

regulations and oversight were loose, and as the phenomenon grew throughout the nation, many faculty members opposed the sport (Smith, 1988). In December 1905, New York University chancellor Henry M. McCracken persuaded representatives from 13 collegiate institutions to attend a meeting in New York City to discuss the problems plaguing college football (Crowley, 2006; Falla, 1981; Rader, 2004). Spurred by discussions at this meeting, the constitution and bylaws for the Intercollegiate Athletic Association of the United States (IAAUS) were formally adopted in the spring of 1906 (Falla, 1981). The newly formed governing body would be renamed the National Collegiate Athletic Association (NCAA) in 1910 (Davenport, 1985; Falla, 1981; Rader, 2004).

A shift in the NCAA's organizational structure was initiated at the August 1973

Special Convention when its membership was reorganized into three divisions for legislative and competitive purposes (Crowley, 2006; Falla, 1981). Institutions wishing to sponsor intercollegiate athletics programs at the highest competitive level joined Division I. In 1978, institutions sponsoring the sport of football at the Division I level further separated into two subdivisions, which were labeled I-A and I-AA, with Division I-A membership consisting of those institutions wishing to sponsor the sport of football at the highest competitive and financial levels. In the fall of 2006, Division I-A was renamed the Football Bowl Subdivision (FBS) and Division I-AA was renamed the Football Championship Subdivision (FCS), indicative of the postseason arrangement of each subdivision. The FBS boasted 120 active members as of the beginning of the 2009 college football season ("Composition & Sport Sponsorship," n.d.).

Demand for NCAA Division I college football, particularly of the FBS variety, has

exploded recently for a variety of reasons (Mandel, 2008). One of the factors creating increased attention for college football is the Bowl Championship Series (BCS), a coalition of Division I-FBS conferences, the University of Notre Dame, and select bowl game organizations ("The BCS is...," n.d.). In 1998, the BCS emerged from the Bowl Alliance with six founding conferences (Atlantic Coast, Big East, Big Ten, Big 12, Pacific-10, and Southeastern) guaranteed automatic bids to a BCS bowl game for their respective conference champions.

Former Southeastern Conference (SEC) Commissioner Roy Kramer, the creator of the BCS, had three objectives for the newly formed BCS: expand interest in the sport, work within the bowl structure, and create a title game (Thamel, 2008). To that end, the stated mission of the BCS is "to match the two top-rated teams in a national championship game and to create exciting and competitive matchups between eight other highly regarded teams in

Figure 1

Membership of the founding Bowl Championship Series Conferences as of the beginning of the 2009 football season

Atlantic Coast Conference (ACC): Boston College, Clemson, Duke, Florida State, Georgia Tech, Maryland, Miami (Fla.), North Carolina, North Carolina State, Virginia, Virginia Tech, and Wake Forest.

Big 12 Conference: Baylor, Colorado, Iowa State, Kansas, Kansas State, Missouri, Nebraska, Oklahoma, Oklahoma State, Texas, Texas A&M, and Texas Tech.

Big East Conference: Cincinnati, Connecticut, Louisville, Pittsburgh, Rutgers, South Florida, Syracuse, and West Virginia.

Big Ten Conference: Illinois, Indiana, Iowa, Michigan, Michigan State, Minnesota, Northwestern, Ohio State, Penn State, Purdue, and Wisconsin.

Pacific 10 (Pac-10) Conference: Arizona, Arizona State, California, Oregon, Oregon State, Stanford, UCLA, USC, Washington, and Washington State.

Southeastern Conference (SEC): Alabama, Arkansas, Auburn, Florida, Georgia, Kentucky, LSU, Mississippi, Mississippi State, South Carolina, Tennessee, and Vanderbilt.

four other games” (“The BCS is ...,” n.d.). While not one of its stated objectives, many observers believe that the BCS system seems to have also increased competitive balance within college football (Sacareno, 2007).

The purpose of this study was to assess whether competitive balance within the six founding BCS conferences has improved since the implementation of the BCS. While recent controversies regarding the perceived fairness of the BCS’s process for selecting teams to participate in its bowl games have brought much attention to the BCS, those issues are outside the scope of this paper and are not addressed.

Competitive Balance in College Football

Several previous studies have examined how competitive balance in college football is affected by numerous variables. Results from these studies shows mixed effects on overall competitive balance.

In one of the earliest studies of competitive balance in college football, Bennett and Fizel (1995) examined the role of television appearances following the 1984 U.S. Supreme Court decision, which ruled that the NCAA Football Television Plan violated the Sherman Antitrust Act. Bennett and Fizel (1995) observed that overall competitive balance on the football field was enhanced by the Supreme Court decision during the study period of 1981-1991.

Eckard (1998) studied competitive balance in seven major NCAA Division I-A conferences prior to and after the beginning of NCAA enforcement of rules violations in 1953. To assess competitive balance, Eckard employed a measure of variance of relative team positions over time. He concluded the results support the hypothesis of the NCAA as a classic economic cartel that reduces competitive balance over time and creates less turnover in conference standings and national rankings.

Sutter and Winkler (2003) concluded that

the NCAA’s rule regarding scholarship limits in college football decreased competitive balance during the period following World War II. Depken and Wilson (2004) drew a similar conclusion in their comprehensive study which explored how different variables in college athletics influence competitive balance in college football. Depken and Wilson’s (2004) study examined the role of several changes in the regulation of college football between 1888 and 2001:

...the initial formation of the NCAA; the initial ban on scholarships; the creation of a viable enforcement mechanism; the limits placed on high-school grade point averages; the creation of multiple divisions in NCAA football; and the creation of the Bowl Championship (BCS) rating system (p. 198)

After calculating both the Herfindahl-Hirschman Index (HHI) to measure between-season competitive balance and a Structure-Conduct-Performance (SCP) to measure how the conduct of the market influenced performance within the industry, Depken and Wilson (2004) concluded that overall NCAA Division I-A (now FBS) football has become less balanced over time, which is relevant for the present study. According to Depken and Wilson (2004, p. 207), “the implementation of the BCS did not significantly alter the competitiveness of college football when measured by the HHI.” However, Depken and Wilson (2004) noted that the BCS did have a negative effect on competitive balance using the SCP measure.

Depken and Wilson’s (2004) study only included the first four seasons of competition after the BCS’s implementation, further underscoring the need for reexamination of this issue by the present study, which includes data from 10 years after the BCS’s creation.

In addition, Depken and Wilson (2004) investigated competitive balance among all college football programs, while the present study focuses upon competitive balance within the founding six BCS conferences.

In a second study on competitive balance in college football, Depken and Wilson (2006) studied the effects of NCAA enforcement on competitive balance in major conferences using the HHI method. The results indicated support for the NCAA's claim that enforcement of its membership enhances competitive balance.

Several researchers have found empirical support for the premise that conference realignment serves as a means to improve competitive balance in college football. Quirk's (2004) historical study of 18 NCAA Division I conferences suggested that a consequence of competitive imbalance within football can lead to churning, i.e., either top teams or bottom teams in a conference will leave to join another conference.

Rhoads (2004) sought to examine whether this churning was attributable solely to football or some combination of variables including other sports. His case study of the Western Athletic Conference and Mountain West Conference found support for increased competitive balance in football over time, but it discovered no impact on other sports. Rhoads (2004) speculated that the establishment of the BCS would increase churning among conferences outside the BCS: "University athletic departments that are not merely trying to protect rents - as the top major conferences are doing - are increasingly looking at achieving optimal competitive balance to maximize television and gate revenues" (p. 18).

Perline and Stoldt (2007) found support for Rhoads' (2004) assertion that conference realignment serves as a means to improve competitive balance in their case study of the Big 12 Conference. Using both within-season and between-season measures for a five-year

period before and a five-year period after realignment, the researchers concluded the Big Eight-Southwestern Conference realignment resulted in greater levels of competitive balance.

Method

This study followed the recommendations of Leeds and von Allmen (2005) by examining both within-season and between-season variations in competitive balance during three five-year periods. The first period included the five seasons prior to the formation of the BCS (1993-1997). The second period included the five seasons immediately after the creation of the BCS (1998-2002), while the third period included the subsequent five seasons from 2003-07.

Within-season variance was evaluated by considering the average standard deviation of team winning percentages for each year studied. Quirk and Fort (1997) described the calculation of within-season competitive balance:

For each team, calculate the difference between the team's W/L percentage for the season and the league average (.500). Square the difference for each team. Add these figures for all teams in the league, and then divide the total by the number of teams in the league. Take the square root, and you have the standard deviation of the league W/L percentages for that season. (p. 245)

Within-season variance, therefore, was calculated as:

$$\sigma_A = \sqrt{(\sum (WPCT - .500)^2) / N}$$

In this case, N is the number of teams in the conference. Such methodology calculates the actual average annual standard deviation. Many researchers (e.g., Bennett & Fizel, 1995; Quirk & Fort, 1997) suggest calculating a ratio of actual standard deviation to the idealized standard deviation. Bennett and Fizel (1995) explained the reason for using this approach:

The standard deviation of actual performance

divided by the idealized standard deviation measures the level of competitive balance. If all teams were of equal playing strength the actual standard deviation would equal the idealized standard deviation. Thus, as competitive balance increases the ratio of actual to idealized standard deviation approaches 1. (p. 189)

Therefore, the formula employed for calculating the ratio was:

$$\sigma R = \sigma A / \sigma I$$

Between-season variance was evaluated by calculating the Herfindahl-Hirschman Index (HHI), a measure of the concentration of firms in an industry (Leeds & von Allmen, 2005; Owen et al., 2007). Humphreys (2002) suggested the HHI was useful in that it reflects the concentration of championships in a sports league over time by measuring the distribution of championship shares. Several previous studies of competitive balance in team sports have employed the HHI (e.g., Depken & Wilson, 2004, 2006; Eckard, 1998; Perline & Stoldt, 2007; Sutter & Winkler, 2003). Championships were determined based on conference standings or the outcome of conference championship games, depending on each respective conference's method for determining its champion. Due to the differing methods used to crown champions in the founding BCS conferences, a decision for the present study needed to be made on the mechanism of awarding championship points for statistical examination. For those conferences that had a post-regular season conference championship game during the seasons under consideration (e.g., Big 12, SEC) the winner of the conference championship game—and consequently the conference's automatic BCS bid—was awarded the conference's entire championship point for that season. Conferences without such a championship game (e.g., Big East, Big Ten, Pac-10) allowed for the possibility of co-champions. In the event of conference

co-champions, the championship point for the season was split evenly among the teams with any claims to the conference title. For example, in 2004 four Big East teams (i.e., Boston College, Pittsburgh, Syracuse, and West Virginia) finished tied atop the conference standings. For that season, each team claiming a share of the Big East championship was awarded .25 championship points. This practice was consistent with Eckard's (1998) recommendation that co-champions be awarded a half point.

The HHI was calculated by measuring the number of championship points earned by each institution during a five-year period, dividing the institution's championship point total for the period by the number of seasons in the period (i.e., 5) to arrive at the institution's percentage of championship points for a period, squaring the percentage to arrive at an institutional total for the period, and then adding the institutional period totals together to arrive at a conference period total. For example, if an institution were to win its conference championship outright during each of the five seasons in a period, the institution would have a championship market share of 100% for the period, resulting in a conference HHI of 10,000 (i.e., 100^2). If a different institution won the conference championship outright each season during the five-year period, each institution would have a championship market share of 20%. Thus, the conference HHI for that period would be 2,000 ($20^2 + 20^2 + 20^2 + 20^2 + 20^2$). A smaller HHI is taken to mean that a conference is more competitively balanced in terms of distribution of championships shares.

Time Periods

Because the present study sought to examine the effect of the Bowl Championship Series on competitive balance in the six founding BCS conferences, calculating the level of competitive balance that existed in each conference prior to the BCS's implementation became necessary.

The five-year period (1993-1997) immediately before the BCS was identified as *P1*. A second five-year period (1998-2002) examined the immediate short-term effects of the BCS on competitive balance and was identified as *P2*. A final five-year period (2003-2007) was selected as *P3* for two reasons. First, it allowed for a longer-term study of the BCS's effect on

competitive balance. In addition, it allowed for the impact of conference realignment which occurred in the Atlantic Coast Conference (ACC) and Big East conferences during the *P3* period. Figure 2 reports the three periods used in the study. For comparison purposes, the researchers treated the Big 12's *P1* figures as if the conference existed for the entirety of *P1*.

Table 1 - Actual Standard Deviation of W/L Percentage

Year	ACC σA	Big 8/12* σA	Big East σA	Big Ten σA	Pac-10 σA	SEC σA	SWC σA
1993	.2654	.2966	.3272	.2758	.2016	.2676	.2648
1994	.3005	.3254	.2789	.2277	.2236	.2853	.2551
1995	.3005	.3029	.3029	.2795	.2548	.2736	.3193
1996	.3005	.2795	.3193	.2919	.2500	.2795	
1997	.3062	.2772	.2368	.3015	.2795	.2652	
P1 (5-yr avg)	.2942	.3083, 1993-95 .2783, 1996-97	.2930	.2753	.2419	.2742	.2798
1998	.2946	.2795	.2765	.3015	.2850	.3146	
1999	.2282	.2841	.2765	.2556	.2305	.2795	
2000	.3005	.3019	.3113	.1922	.2562	.2394	
2001	.2357	.2841	.3193	.1845	.2850	.2447	
2002	.2764	.2652	.3112	.3015	.2437	.2700	
P2 (5-yr avg)	.2671	.2830	.2990	.2471	.2601	.2696	
2003	.2205	.2841	.2856	.2770	.2236	.2932	
2004	.2261	.2447	.2182	.2556	.2850	.2748	
2005	.2165	.2394	.2367	.2718	.2850	.2700	
2006	.2447	.2104	.2573	.3015	.1943	.2652	
2007	.2339	.2500	.1747	.2323	.1878	.2184	
P3 (5-yr avg)	.2283	.2457	.2345	.2676	.2352	.2643	
2006	.2447	.2104	.2573	.3015	.1943	.2652	
2007	.2339	.2500	.1747	.2323	.1878	.2184	
P3 (5-yr avg)	.2283	.2457	.2345	.2676	.2352	.2643	

* - For the years 1993-95, the conference was known as the Big Eight. It became the Big 12 for the 1996 season.

Figure 2

Period 1 (1993-1997 seasons)
 Period 2 (1998-2002 seasons)
 Period 3 (2003-2007 seasons)

Results*Within-Season*

Overall within-season results revealed improved competitive balance in all six conferences following the implementation of the BCS. From *P1* to *P3*, all conferences had

decreased ratios of actual standard deviations to idealized standard deviations ranging from extreme in the ACC ($\sigma R = 1.7653$ to $\sigma R = 1.5277$) to slight in the Big Ten ($\sigma R = 1.8260$ to $\sigma R = 1.7753$) and Pac-10 ($\sigma R = 1.5298$ to $\sigma R = 1.4873$). Table 1 reports complete within-season results including year-to-year scores for actual standard deviations for each conference as well as five-year averages. Table 2 reports year-to-year scores for the ratio of actual to idealized standard deviations for each conference as well as five-year averages.

Table 2 - Ratio: Actual Standard Deviation/Idealized Standard Deviation

Year	ACC σR	Big 8/12* σR	Big East σR	Big Ten σR	Pac-10 σR	SEC σR	SWC σR
1993	1.5811	1.6780	1.8510	1.8293	1.2748	1.8543	1.4981
1994	1.8028	1.8409	1.5775	1.5104	1.4142	1.9767	1.4432
1995	1.8028	1.7133	1.7135	1.8538	1.6113	1.8956	1.8063
1996	1.8028	1.9365	1.8063	1.9365	1.5811	1.9365	
1997	1.8371	1.9203	1.3393	2.0000	1.7678	1.8371	
P1 (5-yr avg)	1.7653	1.7441, 1993-95 1.928, 1996-97	1.6575	1.8260	1.5298	1.9000	1.5825
1998	1.7678	1.9365	1.5639	2.0000	1.8028	2.1794	
1999	1.3693	1.9685	1.5641	1.6956	1.4577	1.9365	
2000	1.8028	2.0917	1.7608	1.2748	1.6202	1.6583	
2001	1.4143	1.9685	1.8065	1.2247	1.8028	1.6956	
2002	1.6583	1.8371	1.7606	2.0000	1.5411	1.8708	
P2 (5-yr avg)	1.6025	1.9605	1.6912	1.6390	1.6449	1.8681	
2003	1.3229	1.9685	1.6154	1.8371	1.4142	2.0310	
2004	1.5000	1.6956	1.1547	1.6956	1.8028	1.9040	
2005	1.5000	1.6583	1.3391	1.8028	1.8028	1.8708	
2006	1.6956	1.4577	1.4558	2.0000	1.2286	1.8371	
2007	1.6202	1.7321	0.9884	1.5411	1.1880	1.5133	
P3 (5-yr avg)	1.5277	1.7024	1.3107	1.7753	1.4873	1.8312	

* - For the years 1993-95, the conference was known as the Big Eight. It became the Big 12 for the 1996 season.

While competitive balance improved in all six conferences from *P1* to *P3*, only four conferences improved competitive balance from *P1* to *P2*, the immediate five-year period following the BCS's creation. Both the Big East ($\sigma R = 1.6575$ to $\sigma R = 1.6912$) and Pac-10 ($\sigma R = 1.5298$ to $\sigma R = 1.6449$) showed decreased competitive balance during this period. Only the Big Ten ($\sigma R = 1.6390$ to $\sigma R = 1.7753$) exhibited decreased competitive balance between *P2* to *P3*.

Between-Season

Unlike the within-season results where all six founding BCS conferences exhibited improved competitive balance, overall between-season results showed competitive balance improvement in only three of the six conferences following the implementation of the BCS, meaning frequent turnover of championship teams was not observed in all conferences. The Pac-10 showed the greatest decrease in competitive balance from *P1* to *P3* (HHI = 1595 to HHI = 6600), while the ACC (HHI = 8200 to HHI = 3600) and the SEC

(HHI = 6800 to HHI = 2800) demonstrated the greatest improvement in competitive balance between *P1* and *P3*. The Big East essentially stayed the same, regardless of whether the University of Miami's 1995 season, in which the institution was ineligible for the conference title, was included (HHI = 2723 to HHI = 2700) or not (HHI = 2523 to HHI = 2700).

While between-season competitive balance improved from *P1* to *P2* in four of the six founding BCS conferences, between-season competitive balance decreased in four of the six conferences from *P2* to *P3*, the second five-year period following the BCS's creation. The Big 12 (HHI = 2800 to HHI = 4400), Big Ten (HHI = 1744 to HHI = 3600), Pac-10 (HHI = 1795 to HHI = 6600), and SEC (HHI = 2000 to HHI = 2800) showed decreased competitive balance during this period. Only the ACC (HHI = 5400 to HHI = 3600) and Big East (HHI = 4400 to HHI = 2700) exhibited increased competitive balance between *P2* to *P3* (see Table 3 for complete between-season results).

Table 3 - Between-Season Results

Period	ACC HHI	Big 8/12* HHI	Big East HHI	Big Ten HHI	Pac-10 HHI	SEC HHI	SWC HHI
P1 (1993- 1997)	8200	10000, 1993-95 5000, 1996-97	2523 ^a 2723 ^b	2200	1595	6800	2889 ^c 5556 ^d
P2 (1998- 2002)	5400	2800	4400	1744	1795	2000	
P3 (2003- 2007)	3600	4400	2700	3600	6600	2800	

^a Miami not eligible for 1995 Big East championship. ^b Includes Miami as co-champion in 1995. ^c Texas A&M not eligible for 1994 SWC championship. ^d Includes Texas A&M as outright champion in 1994.

* - For the years 1993-95, the conference was known as the Big Eight. It became the Big 12 for the 1996 season.

Conclusions

Within-Season Measure

The ACC showed the greatest overall increase of competitive balance during the study period ($\sigma R = 1.7653$ to $\sigma R = 1.5277$). This is largely attributable to the introduction of three new schools—Boston College, the University of Miami (Fla.), and Virginia Tech—during the study period. The presence of these football programs effectively balanced out the dominance of schools such as Florida State and Georgia Tech and created more overall uncertainty of outcome in conference games.

Results from the Big East were mixed with a strong overall increase in competitive balance from *P1* to *P3* ($\sigma R = 1.6575$ to $\sigma R = 1.3107$), despite a decrease in competitive balance from *P1* to *P2* ($\sigma R = 1.6575$ to $\sigma R = 1.6912$). One noteworthy finding is that the end of *P2* was the last period before the departures of Boston College, Miami (Fla.), and Virginia Tech for the ACC. *P3* represented the period when Cincinnati, Connecticut, Louisville, and South Florida joined the Big East. Similar to the ACC, realignment in the Big East appears to have created an overall more competitive conference.

While the ACC and Big East were improving within-season competitive balance, the Big Ten was moving in the opposite direction, showing greatly reduced competitive balance between *P2* to *P3* ($\sigma R = 1.6390$ to $\sigma = 1.7753$). This decrease moved the Big Ten from the conference with the most balance in *P2* to the conference with the least balance in *P3*. This would seem to suggest teams in the Big Ten experienced very little outcome uncertainty in their conference games. The same teams in the conference (e.g., Ohio State and Penn State) have high winning percentages from season to season, and the same teams (e.g., Minnesota and Indiana) also have poor winning percentages from season to season. In fact, within the *P3* period, Indiana produced three 1-7 seasons and

two 3-5 seasons, while Ohio State finished 8-0 once, 7-1 twice, 6-2 once, and 4-4 once.

Given that all six conferences showed improved within-season competitive balance between *P1* and *P3*, arguing that the Bowl Championship Series has hurt competitive balance in college football becomes difficult. The Big Ten is trending toward less competitive balance recently, but most conferences have exhibited consistent, steady trends toward more outcome uncertainty in their football games.

Further, the results of the within-season measure seem to validate the decisions of the ACC and Big East conferences to add members, at least in terms of football competitive balance. The impact of those decisions on other aspects of the athletic department and university missions, though certainly important issues for consideration, are beyond the scope of the present study.

Between-Season Measure

The ACC was the only conference that became increasingly competitive with the passing of each period of measurement. Several factors likely led to the ACC's display of increased between-season competitive balance during the periods under consideration. First, Florida State dominated the ACC upon joining the conference in 1992, winning at least a share of the conference title every season between 1992 and 2000. Consequently, Florida State would not claim at least a partial championship point for a season (i.e., 2001) until *P2*. The ACC's increase in between-season competitive balance from *P2* to *P3* is likely attributable to the addition of new members Boston College, Miami, and Virginia Tech during *P3*, which gave the conference 12 members, permitting the conference to hold a conference championship game (per NCAA mandates). Thus, the conference's championship point could no longer be split because an outright conference champion could now be crowned via the championship game. Finally, the ACC

had much room for improvement, as the conference sported the worst between-season competitive balance of any of the founding BCS conferences in *P1* (HHI = 8200) and *P2* (HHI = 5400).

To the contrary, the Pac-10 was the only conference to exhibit a decrease in between-season competitive balance with each passing period. The continual decline of between-season competitive balance in the Pac-10 can likely be attributed to two related factors: first, the University of Southern California (USC) reemerged as a dominant program in *P3*; and second, the Pac-10 permits for the possibility of co-champions, allowing USC to claim a share of the conference championship without winning the conference outright in 2006 and 2007. Consequently, USC was able to earn at least a share of a championship point during every season in *P3*.

Between-season competitive balance patterns for the Big 12, Big Ten, and SEC were found to be similar. Each of the aforementioned conferences experienced an increase in between-season competitive balance from *P1* to *P2*, only to see between-season competitive balance decrease from *P2* to *P3*. The Big East was the only conference other than the Pac-10 to experience a decrease in between-season competitive balance from *P1* to *P2*. However, unlike the Pac-10, the Big East rebounded in *P3* by posting an increase in competitive balance as compared to *P2*. The Big East's increase in between-season competitive balance was likely stimulated by the departure of Boston College, Miami, and Virginia Tech and the addition of new institutions Connecticut, Cincinnati, Louisville, and South Florida. The departure of Miami and Virginia Tech was particularly helpful to improving the Big East's between-season competitive balance from *P2* to *P3*, as the two institutions accounted for 80% of the conference's championship point total during *P2*.

The Big Ten and SEC had the greatest competitive balance, as measured by HHI, in the periods after the implementation of the BCS (i.e., *P2* and *P3*). Given that the two conferences determine their respective champions in dissimilar fashions, different explanations for these results likely exist. Only three of the 11 Big Ten institutions failed to earn at least a share of a conference title during *P2* or *P3* (i.e., Indiana, Michigan State, and Minnesota). The 1998 (Michigan, Ohio State, and Wisconsin) and 2000 (Michigan, Northwestern, and Purdue) seasons, in which three teams laid claim to a share of the conference title, contributed greatly to a *P2* conference-HHI of 1744 for the Big Ten. As for the SEC, only one institution—Louisiana State University (LSU) in *P3*—won multiple conference championship within *P2* or *P3*. *P2* was particularly balanced, as each season in the period ended with a different institution being crowned SEC champion.

Finally, one interesting note is that, for each of the three periods under consideration, the respective founding BCS conferences with the best and worst HHI figures were conferences whose champions were not determined by a championship game. Thus, it can be concluded for the period under study that those conferences without a championship game were at neither an advantage nor a disadvantage for between-season competitive balance due to their lower number of conference members.

Study Limitations and Future Research

This study employed a standard HHI as suggested by Leeds and von Allmen (2005, p. 163) because it “allows us to compute a benchmark against which we can compare results.” However, such an approach does not account for a change in number of firms (or teams) within a conference over a given period of time (i.e., ACC). Other studies measuring

competitive balance in sports recommend using a normalized HHI to account for the change in number of teams in a league or conference over a period of time (e.g., Depken & Wilson, 2004; Owen, Ryan, & Weatherston, 2007).

Conferences use different criteria to determine champions in the event of a tie, creating possible inequities between the conferences composing the study population. As previously mentioned, the NCAA mandates that a conference have 12 FBS members in order to hold a conference championship game. Only three BCS conferences (ACC, Big 12, and SEC) met this criterion at some point during the study period, creating a situation where the champions of those conferences must win an extra game.

For example, during every season under consideration, the SEC champion was determined by the conference's championship game. Thus, the conference's championship point for a particular season was never split. Meanwhile, the possibility existed for co-champions in some conferences, such as the Pac-10, meant more than one institution could earn a portion of a championship point for a particular season. A case could be made to consider both conference championship game participants as co-champions and award each a half-point. However, the present study chose to award only a single point to the winner of the conference championship game.

Had conferences such as the Big Ten sponsored a conference championship game, or had conferences such as the SEC based its champion on regular-season in-conference record, the results and conclusions of this study could look very different. Future research may wish to examine whether the presence of a conference championship game affects between-season competitive balance.

Overall Conclusions and Implications

The study confirms the notion that overall competitive balance in the founding BCS conferences has improved since the beginning of the BCS in 1998. All six founding BCS member conferences scored higher on the within-season measure of competitive balance, and three of the six member conferences showed improved competitive balance using the between-season measure. Several conclusions and implications emerge from this.

First, given that demand for the sport product is attributable, in part, by the closeness of the competition, or the uncertainty of game outcomes, (Humphreys, 2002; Simmons, 2006), conferences may be in position to leverage competitive balance for greater revenues. In late 2008, the SEC, a conference that showed steady within-season improvement in competitive balance and overall improvement in between-season competitive balance, signed a 15-year, \$2.25 billion multimedia contract with ESPN ("ESPN, SEC reach," 2008). Conferences seeking to increase revenues through enhanced rights agreements similar to the SEC could point to their competitive balances and greater uncertainty of outcome as a selling tool.

Second, despite the finding that all six conferences showed improved *within*-season competitive balance between *P1* and *P3*, four of the six conferences witnessed decreased *between*-season competitive balance between *P2* and *P3*. This trend should alarm those associated with the conferences as it suggests while overall balance is getting better, the top teams consistently remain strong year to year. Nowhere was this more pronounced than the Pac-10 Conference, where within-season competitive balance improved from *P2* to *P3* ($\sigma R = 1.6449$ to $\sigma R = 1.4873$), while between-season balance decreased significantly from *P2* to *P3* (HHI = 1595 to HHI = 6600). USC captured three conference championships

outright and shared two others (with California in 2006 and Arizona State in 2007) during P3.

Failure to achieve between-season competitive balance, such as in the Pac-10, may have the opposite effect of increasing demand for the product. While demand may increase for games in which the outcome may not be known (e.g., Oregon State vs. Stanford), the repeated championships for USC may actually decrease demand for its games within the Pac-10 as consumers become less motivated to attend/consume games in which the outcome may not be as uncertain.

Finally, recent conference realignment seems to have positively impacted competitive balance in the ACC and Big East, which were the only realigned BCS conferences. This finding falls in line with the theoretical proposition of Fort and Quirk (1999), who suggested, "One consequence of imbalance is that if there is a great disparity in drawing potential between two conference colleges, either the weaker or the stronger, or both, will be under both internal and external pressure to leave the conference" (p. 19). Fort and Quirk asserted that conference realignment will have the effect of grouping members with similar drawing power.

Quirk (2004) tackled this notion empirically in his study of 18 NCAA Division I conferences between their inception and 2001 and concluded, "There is evidence of considerable amounts of 'churning' in conference memberships for those major conferences below the top level, and there might be a link between this churning and competitive balance problems within the conference" (p. 72).

The present study's findings compliment the research of Perline and Stoldt (2007) and Rhoads (2004), both of which concluded that conference realignment had a positive effect

on competitive balance. At the time when this article was written, both the Big Ten and Pac-10 conferences were rumored to be considering expansion to 12 or more teams ("Big Ten," 2009; Big12Sports.com, 2010). Evidence in this paper suggests such realignment would benefit the competitive balances in those conferences.

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RESEARCH THAT MATTERS!

THE INFLUENCE OF THE BOWL CHAMPIONSHIP SERIES ON COMPETITIVE BALANCE IN COLLEGE FOOTBALL

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Research Problem

The purpose of this study was to assess whether competitive balance within the six founding Bowl Championship Series (BCS) conferences has improved since the implementation of the BCS. Competitive balance in sport has been identified as a predictor of demand for sporting events and leagues. The present study confirms, through empirical results, that within-season competitive balance within all six founding BCS conferences has improved since its creation. However, only three of the six conferences exhibited improved between-season competitive balance, meaning frequent turnover of championship teams was not observed in all conferences. This article would likely be useful to intercollegiate athletic managers in any of the six BCS conference offices as well as their member institutions.

Issue

Scholars in sport marketing and sport economics regularly cite the importance of the uncertainty of outcome as a unique factor in sport, and one which helps dictate demand for the sport product. Spectators would be less inclined to purchase tickets to an event whose outcome was predetermined. As a result, sport leagues and governing bodies often take measures to ensure a level of competitive balance exists within their leagues or bodies.

Humphreys (2002, p. 133) stated competitive balance was “thought to be an important determination of demand for sporting events” because it reflects uncertainty about the outcome. The less certain the outcome of a particular event, the greater the interest or demand for that event.

Sports Illustrated writer Stewart Mandel indicated in his 2008 book *Bowls, Polls & Tattered Souls* that demand for NCAA Division I college football has exploded recently for a variety of reasons. One factor creating increased attention for college football is the Bowl Championship Series (BCS), a coalition of Division I-FBS conferences, the University of Notre Dame, and select bowl game organizations. The BCS emerged from the Bowl Alliance in 1998, with six founding conferences (Atlantic Coast, Big East, Big Ten, Big 12, Pacific-10, and Southeastern) guaranteed an automatic bid to a BCS bowl game for their respective conference champion.

Former Southeastern Conference Commissioner Roy Kramer, the creator of the BCS, told *New York Times* writer Pete Thamel in 2008 that he had three objectives for the BCS at the time of its founding: expand interest

in the sport, work within the bowl structure, and create a title game. At the end of the 2007, *USA Today* writer Jon Sacareno observed that while not a stated objective, the BCS system seems to have also increased competitive balance within college football. Regardless of the objectives of the BCS, the reality is that a fair amount of criticism is leveled against the BCS each year by universities outside the BCS, certain members of the media, and, more recently, publically elected members of Congress.

This controversy is not, however, altogether bad for the BCS. Economics professors Randy Grant, John Leadley, and Zenon Zygmunt wrote in their 2008 book, *The Economics of Intercollegiate Sports*, broadcast networks may actually favor the BCS because the controversial nature drives ratings upward. Further, the possibility of a playoff system similar to what is contested in basketball would weaken the importance of the regular season and drive ratings downward.

Although not a focus of this study, current controversy surrounding the BCS and its process for determining a national champion is worth noting. Individual universities, Congressmen, and even the President of the United States have suggested college football would be better served with a playoff system. An analysis of those opinions is beyond the scope of the current study.

The purpose of this study, therefore, was to assess whether Saraceno's observation of increased competitive balance within the six founding BCS conferences was true and how those findings might affect the landscape of college football.

Summary

This study followed the recommendations of Leeds and von Allmen (2005) by examining both within-season and between-season variation in competitive balance during three five-year periods. The first period studied was the five seasons prior to the formation of the BCS (1993-1997). The second period studied was the five seasons immediately after the creation of the BCS (1998-2002), while the third period included the subsequent five seasons from 2003-2007.

Within-Season Balance

Within-season variance measures how teams in a given conference or league vary in competition in a given year. If all teams were of equal playing strength, it would be assumed that all teams would win half their games and lose the other half, i.e., each team would have a .500 winning percentage. Within-season balance was evaluated by considering the ratio of actual average standard deviation of team winning percentages for each year studied to the idealized standard deviation.

Overall within-season results revealed improved competitive balance in all six conferences following the implementation of the BCS. From 1993-2007, all conferences had decreased ratios of actual standard deviations to idealized standard deviations ranging from highly increased competitive balance in the ACC to slight increased competitive balance in the Big Ten and Pac-10.

While overall competitive balance improved from 1993-2007, only four conferences improved competitive balance from 1998-2002, the immediate five-year period following the BCS's creation. Both the Big East and Pac-10 showed decreased competitive balance during this period. Only the Big Ten exhibited decreased competitive balance from 2003-2007.

Between-Season Balance

While within-season variance measures dispersion from top to bottom within a given conference or league, it does not measure whether the same team wins the conference championship from year to year. To accomplish this, between-season variance was evaluated by calculating the Herfindahl-Hirschman Index (HHI), a measure of the concentration of firms in an industry. The HHI was useful in that it reflects the concentration of championships in a sports league over time by measuring the distribution of championship shares. Championships were defined based on conference standings or outcome of conference championship games, depending on each respective conference's method for determining a champion. Co-champions were awarded a half point based on the recommendation of Eckard (1998).

Unlike the within-season results, overall between-season results showed competitive balance improvement in only three of the six conferences following the implementation of the BCS, meaning frequent turnover of championship

teams was not observed in all conferences. The Pac-10 showed the greatest decrease in competitive balance from 1993-2007, while the ACC and the SEC demonstrated the greatest improvement in competitive balance between 1993-2007. The Big East essentially stayed the same, regardless of whether the University of Miami's 1995 season, during which the institution was ineligible for the conference title, was included or not.

Analysis

Within-Season Balance

The ACC showed the greatest overall increase of within-season competitive balance during the study period. This is largely attributable to the introduction of three new schools—Boston College, Miami (Fla.), and Virginia Tech—during the study period. The presence of these football programs effectively balanced out the dominance of schools such as Florida State and Georgia Tech and created more overall uncertainty of outcome in conference games.

Results from the Big East were mixed with a strong overall increase in competitive balance from 1993-2007, despite a decrease in competitive balance from 1998-2002. Of note is that, during the end of that period, Boston College, Miami (Fla.) and Virginia Tech were still in the Big East. The 2003-2007 period included conference newcomers Cincinnati, Connecticut, Louisville, and South Florida. This realignment appears to have created an overall more competitive conference.

While the ACC and Big East were improving within-season competitive balance, the Big Ten was moving in the opposite direction, showing greatly reduced competitive balance from 2003-2007. This decrease moved the Big Ten from the conference with the most balance between 1998-2002 to the conference with the least balance from 2003-2007, which suggests that teams in the Big Ten experienced very little outcome uncertainty in their conference games. Given that all six conferences showed improved within-season competitive balance between 1993-2007, arguing that the Bowl Championship Series has hurt competitive balance in college football becomes difficult.

Between-Season Balance

The ACC was the only conference that became increasingly competitive in terms of between-season balance with the passing of each period of measurement. Several factors likely led to the ACC's display of increased between-season competitive balance during the periods under consideration. First, Florida State dominated the ACC upon joining the conference in 1992, winning at least a share of the conference title every season between 1992-2000. The ACC's increase in between-season competitive balance from 2003-2007 is likely attributable to the addition of new members Boston College, Miami, and Virginia Tech during 2004, which gave the conference 12 members, permitting it to hold a championship game per NCAA mandates. Accordingly, the conference's championship point could no longer be split because an outright conference champion could be crowned via the championship game. Finally, the ACC had much room for improvement, as the conference sported the worst between-season competitive balance of any of the founding BCS conferences from 1993-2002.

Conversely, the Pac-10 was the only conference to exhibit a decrease in between-season competitive balance with each passing period. The continual decline of between-season competitive balance in the Pac-10 can likely be attributed to two related factors: first, USC reemerged as a dominant program from 2003-2007; and second, the Pac-10 permits for the possibility of co-champions, which allowed USC to share a claim to the conference championship without winning the conference outright in 2006 and 2007. Consequently, USC was able to earn at least a share of a championship point during every season from 2003-2007.

Finally, another interesting note is that for each of the three periods under consideration, the respective founding BCS conferences with the best and worst HHI figures were conferences whose champions were not determined by championship games. Thus, for the periods under consideration, those conferences without championship games were at neither an advantage nor a disadvantage for between-season competitive balance due to their lower number of conference members.

Discussions/Implications

The study supports the notion that overall competitive balance in the founding BCS conferences has improved since the beginning of the BCS in 1998. All six founding BCS member conferences scored higher on the within-

season measure of competitive balance, and three of the six member conferences showed improved competitive balance using the between-season measure.

Several conclusions and implications emerge from these findings.

First, given that demand for sport product is attributable in part to the closeness of the competition (or the level of uncertainty of game outcomes), according to results of this study, intercollegiate conferences may be in a position to leverage this increased competitive balance for greater revenues in various contract negotiations. In late 2008, the SEC, a conference which showed steady within-season improvement in competitive balance and overall improvement in between-season competitive balance, signed a 15-year, \$2.25 billion multimedia contract with ESPN. Conferences seeking to increase revenues through enhanced rights agreements similar to the SEC could point to competitive balance and uncertainty of outcome as a selling tool.

Second, despite the finding that all six conferences showed improved *within*-season competitive balance between 1993 and 2007, four of the six conferences witnessed decreased *between*-season competitive balance between 2003 and 2007. This trend should alarm those associated with the conferences as it suggests that, while overall competitive balance is improving, the top teams remain strong from season to season. Nowhere was this more pronounced than the Pac-10, where within-season competitive balance improved from 2003 to 2007 while between-season balance simultaneously decreased significantly in the same period as USC captured three conference championships outright and shared two others (2006 with California and 2007 with Arizona State).

Failure to achieve between-season competitive balance, such as within the Pac-10, may have the opposite effect of increasing demand for the product. While demand may increase for games in which the outcome may not be known (e.g., Oregon State vs. Stanford), the repeated championships for USC may actually decrease demand for its games within the Pac-10 as consumers become less motivated to attend/consume games in which the outcome may not be as uncertain.

Finally, recent conference realignment seems to have positively impacted competitive balance in the ACC and Big East, the only founding BCS conferences to expand during the study period. Given NCAA rules regarding conference championship games, it seems unlikely that conferences with 12 members (SEC, ACC, and Big 12) would add members. However, for the remaining three BCS conferences (Big East, Big Ten, and Pac-10), both room and motivation to grow exist, according to results of this study. Previous research has suggested that conference realignment will have the effect of grouping members with similar drawing power. This grouping could create uncertainty in conferences outside of the BCS. As sports economist James Quirk noted in 2004, "There is evidence of considerable amount 'churning' in conference memberships, for those major conferences below the top level, and there might be a link between this churning and competitive balance problems within the conference."

Essentially, according to results of this study, the Big East, Big Ten, and Pac-10 would benefit from adding additional schools from non-founding BCS conferences such as the Mountain West, Conference USA, and Mid-American. While this would improve the fortunes of the BCS conferences, it would likely further hurt the non-BCS conferences.