

**Information, Prediction Markets, and NCAA Basketball
Attendance: The Big East Conference**

**Rodney J. Paul – Syracuse University
Andrew P. Weinbach – Coastal Carolina University
Jonathan C. Plaut – Syracuse University**

Corresponding Author:

**Rodney J. Paul
Professor
Department of Sport Management
The David B. Falk College of Sport and Human Dynamics
810 Nottingham Road
Syracuse, NY 13224-2238
P: 315-443-8165
F: 315-443-9716
Email: rpaul01@syr.edu**

Information, Prediction Markets, and NCAA Basketball Attendance: The Big East Conference

Abstract: In recent years, the introduction and investigation of prediction markets and their uses has become very popular in the economics and finance literature. One place where the use of sports prediction markets, more commonly thought of as betting markets, is quite helpful is in exploring the validity of the uncertainty of outcome hypothesis. The uncertainty of outcome hypothesis states that fans prefer to watch games where the expected outcome of the game is close. We test this hypothesis for Big East college basketball, using betting market prices, and find support for this hypothesis in this market. In addition, expected scoring, also formed from prediction markets, is shown to increase attendance.

I. Introduction

The link between expectations and consumer behavior is an important element in determining consumer demand in a variety of markets. In relation to sports, this investigation into expectations about game outcomes and their impact on purchasing decisions for game tickets centers around the Uncertainty of Outcome Hypothesis. The basic premise behind this idea is that if fans enjoy uncertainty of outcome, in that they enjoy close games between relatively evenly matched teams, measures of uncertainty of outcome should have a significant effect on attendance. Odds and pointspreads from prediction markets (betting markets) are used as measures of uncertainty of outcome and are included in regression models of attendance.

Another element of expectations which could be important to sports-related markets is the role of expected scoring. If fans prefer to see more scoring compared to less due to more scoring generally being associated with more game excitement in the minds of most sports fans, games that feature higher-scoring teams are likely to have more fans purchase tickets. The expectations of scoring in a particular sport are also available through prediction market data, specifically, the posted betting market total on the game. The total, often referred to as the over/under, is the number at which bettors could place a wager on either more points being scored or fewer points being scored than the posted total. Other than the tails of the distribution, where the highest totals tend to be set slightly too high, the totals in the over/under market have been shown to be efficient.

We wish to extend the study of uncertainty of outcome and expected scoring as it relates to game attendance to college basketball in the United States. Specifically, we are studying one of the top NCAA basketball conferences in the country, the Big East. The Big East consists of sixteen teams, located mostly in the Northeastern part of the United States. The colleges of the big east differ in size and quality and most of the schools have a long and storied tradition with basketball. A list of the colleges in the Big East is given in appendix I.

Data was gathered for attendance on Big East basketball games for the previous three seasons, through the 2010-11 campaign. Games include both conference and non-conference games played at the home court of Big East Schools. In conjunction with game attendance, attributes of the colleges themselves, local area population and income per capita, and betting market data on the pointspread and total were gathered for each team and game.

The null hypotheses we test are that fans prefer uncertainty of outcome in college basketball and that they prefer more scoring to less. These are directly tested by including the pointspread and the total as independent variables in the regression and testing for statistical significance and sign of the coefficient. In addition, factors such as university enrollment, average SAT score, population, income per capita, and other control variable are included and their impact on game attendance is explored.

This paper is organized as follows. Section II presents a background literature review on uncertainty of outcome and game attendance. Section III presents the regression model and its results. Section IV concludes the paper.

II. Literature Review on Uncertainty of Outcome and Attendance

The effects of uncertainty of outcome as it pertains to game attendance have been studied for a variety of sports around the world. Many studies have attempted to decipher how the uncertainty of outcome impacts attendance in the English Football (Soccer) league. Peel and Thomas (1988) consider betting odds as a good ex-ante measure of uncertainty of outcome, suggesting that departures from efficiency in this market appear to be small. The authors examine attendances in the English Football League for the 1981-1982 season, and conclude that fans appear to enjoy uncertainty of outcome, as proxied by betting odds, but also prefer to attend games with good teams.

Peel and Thomas (1992) also studied English Football in the 1986-87 season, concluding that fans do not wish to attend games with very high odds on the favorite. In addition, Peel and Thomas (1992) found that fans enjoy when the home team is favored, meaning that, all else equal, fans would prefer to see a close game in which the home squad prevails. Expected goals scored, proxied by the betting market over/under (total) was also shown to have positive and significant effects on attendance. This illustrates a clear preference for more scoring compared to less.

Forrest and Simmons (2002) researched the 1997-98 season and found support that uncertainty of outcome helps to increase attendance. Using betting market odds and correcting for behavioral biases in the market, Forrest and Simmons (2002) find that fewer fans attend games when the adjusted odds on the favorite are quite high, while more fans attend games as the odds on the favorite fall.

All three divisions of the Scottish Football League were studied by Peel and Thomas (1996) for the 1991-92 season using betting market odds as a measure of uncertainty of outcome. Based on the model of Theil (1967), maximum uncertainty of outcome is found to occur when the probabilities of a home win, road win, and draw are all equal. The authors conclude that fans do not have a preference for uncertainty of outcome in Scottish Football.

Buraimo and Simmons (2009) also show that fan attendance is not influenced by uncertainty of outcome in the traditional expected manner. In a study of the Spanish Primera division, fans attending games prefer less uncertainty of outcome in Spanish Football. Using betting market odds to construct the probability of a home win, Buraimo and Simmons (2009) show that attendance is maximized when there is a high home team win probability or there is a low home team win probability. Overall, these results concerning attendance reject the uncertainty of outcome hypothesis, as fans do not appear to enjoy expected close matches in the Spanish Primera Division.

The sport of Rugby has also attracted considerable attention in terms of the testing of uncertainty of outcome on attendance using betting market odds. In a study of British rugby league matches in the 1994-95 season, Peel and Thomas (1996) determine that outcome uncertainty plays a significant role in the determination of attendance for rugby. Fans of rugby appear to enjoy uncertainty of outcome as betting market odds on this sport have a negative and significant effect on attendance. Therefore, as the odds on the favorite increases, fewer fans attend these games.

Carmichael, et al (1999) also found statistical evidence of the uncertainty of outcome being important as it relates to rugby attendance. Using the 1994-95 season of English Rugby League fixtures, the authors find that attendance is lower for games with longer match odds. This means that as the odds on the favorite increases, fewer fans attend rugby matches. Again, this suggests that fans do enjoy uncertainty of outcome in this sport. In addition, Carmichael, et al (1999) also examined the pre-season odds of each team to win their division and found that teams which were longshots to win their divisions had lower attendance, while teams which were favorites or had shorter odds to win the division had higher attendance at their matches. This result also supports the notion of the importance of uncertainty of outcome as fans prefer to watch teams which have a chance to win their division and overall title.

For rugby in New Zealand, however, uncertainty of outcome was not shown to have an impact on attendance. In a study of the Super 12 Rugby league for the 1999-2001 seasons, Owen and Weatherston (2004) used betting odds as a proxy for uncertainty of outcome. Based on attendance at individual matches, the authors find little evidence that uncertainty of outcome has any effect on attendance.

Uncertainty of outcome in cricket matches was studied by Morley and Thomas (2007). In an examination of the limited overs cricket matches for 1996 and 1997, the authors found that uncertainty of outcome apparently was not preferred by fans. As the odds on the favored team increased, more fans actually attended the games.

In the major North American sports, the relationship between attendance and uncertainty of outcome has also been studied and the results have generally been consistent. Welki and Zlatoper (1999) examined the National Football League. They used actual game attendance as a proportion of total tickets sold as their dependent variable to capture both the number of people in attendance and those with tickets who chose not to attend the game. The points spread and points spread squared were used as proxies for uncertainty of outcome in NFL games and found support for the uncertainty of outcome hypothesis. Games with smaller points spreads, all else equal, were shown to generate higher attendance.

In Major League Baseball, Knowles, Sherony, and Halpert (1992) studied the 1988 National League season. They used betting market odds to construct the probability of a home team win, which served as a proxy for uncertainty of outcome within the games. The authors found that uncertainty of outcome, as measured through the odds, was a significant determinant of attendance. This led to their conclusion that the maximization of fan attendance would occur when the home team was a slight favorite. Rascher (1999) studied the 1996 baseball season and found similar fan preference for uncertainty of outcome. In general, large favorites were not found to be popular with the ticket-buying baseball audience. Like Knowles, et al (1992) slight home favorites outperformed other favorites at the gate.

Lemke (2010) found the opposite result for the 2007 Major League baseball season. The betting market odds on baseball games was included in an attendance model and used as a measure of expected win probability, reflecting uncertainty of outcome. This variable was

included alongside many other explanatory variables, many directly correlated with the betting market odds, and the opposite result compared to the other baseball studies was found. Lemke (2010) found that fans in the 2007 season preferred a lack of uncertainty of outcome as attendance increased as the probability of the home team winning increased. This result could represent a fundamental change in the way baseball fans viewed their sport, or the relationship between the betting market odds and other explanatory variables may confound this result.

In relation to the study of basketball, Mills and Fort (2011) studied the NBA, along with the NFL and NHL, and found that the effect on attendance of uncertainty of outcome differs widely across these sports. He concludes that there is little evidence supporting the uncertainty of outcome hypothesis. Rascher and Solmes (2007) suggest that while uncertainty of outcome in basketball is important, fans in attendance prefer to see their team win. They suggest that fans prefer situations where the home team is expected to win two-thirds of the time, compared to other possible win probabilities.

Overall, the results relating uncertainty of outcome to game attendance appears mixed. This could be a result of the time and actual costs of attending a live sporting event plays a key role in what fans desire, whether that is for an easy win by the home team to allow for celebration before, during and after the game, or if they would prefer a close contest. A less ambiguous market might be the study of uncertainty of outcome as it relates to television audiences, where the cost of watching the game, or switching it off, is much lower. In addition, with many sports in relation to television, other games may appear on television at the same time, driving fans to watch the most competitive games. Forrest, Simmons, and Buraimo (2005) and Paul and Weinbach (2007) are a couple of examples where TV audiences and uncertainty of outcome are examined.

III. Regression model of Big East Basketball Attendance

The basic regression model for this study uses individual game attendance for each home game for Big East basketball from the 2008-09 season to the 2010-11 season as the dependent variable. The independent variables consist of control variables for the college and local city, days of the week, months of the season, and variables representing team success and our measures of uncertainty of outcome and expected scoring. The regression model is presented in equation 1 below.

$$\text{Attendance}_t = \alpha_0 + \beta_1 (\text{Stadium Capacity}) + \beta_2 (\text{Population}) + \beta_3 (\text{Income Per Capita}) + \beta_4 (\text{Enrollment}) + \beta_5 (\text{Enrollment}^2) + \beta_6 (\text{SAT Score}) + \beta_7 (\text{Sunday}) + \beta_8 (\text{Monday}) + \beta_9 (\text{Tuesday}) + \beta_{10} (\text{Thursday}) + \beta_{11} (\text{Friday}) + \beta_{12} (\text{Saturday}) + \beta_{13} (\text{December}) + \beta_{14} (\text{January}) + \beta_{15} (\text{February}) + \beta_{16} (\text{March}) + \beta_{17} (\text{Win Percentage}) + \beta_{18} (\text{Home Favorite Dummy}) + \beta_{19} (\text{Absolute Value of Points Spread}) + \beta_{20} (\text{Total}) + \varepsilon \quad (1)$$

The variables representing the college and the city in which it resides consist of a variety of factors which are likely to influence attendance. The population variable represents the population of the local city where the university is located. Population has been shown to have different effects on attendance in different sports at a variety of levels. It is likely that more populated areas will attract more fans, due to the presence of more people who might be college basketball fans, but larger areas also contain more entertainment options, which could decrease attendance. Income per capita is the income of the local city. The impact of income per capita

on attendance has varied across different sports and settings. Although it may seem likely that cities with higher income per capita figures would attract a greater number of fans, it is possible that college basketball could be an inferior good, where higher income areas actually lead to fewer fans in attendance. Like the attendance variable described above, this is likely due to other entertainment options available in a city when it is wealthier overall.

The overall size of the student body is likely an important determinant of attendance for college sports. Given the difference in size of the universities in the Big East conference, we ultimately settled upon using both enrollment and enrollment squared to represent the size of the university. We would expect attendance to increase with enrollment, but it may decline for the largest of schools, again, given other entertainment activities available on campus. In a similar vein, the size of the arena is also included as an independent variable to account for the arena the games take place in. In previous research, most of the stadium capacity variables have been shown to have a positive effect on attendance.

Other variable included with the college variables was average SAT score. Given its availability, along with the other independent variables noted above, it was included in the regression to determine if the overall quality of the student has any impact on game attendance. This variable could reflect something about preferred sports of different levels of intellectual ability or it could reflect something to do with the opportunity cost of studying compared to attending a college basketball game. In any case, we thought it could provide some insight and interesting results if included in the model.

The next set of variables included in the regression model as independent variables account for the day of the week and the month of the season. Wednesday is the excluded categorical dummy for the days of the week and November, the first month of the season, is the excluded category for the months of the season. Due to the opportunity cost of the fans' time, weekend games are likely to be more popular than weekday games. With respect to the months of the season, due to the excitement of the NCAA basketball tournament, games are likely to be more interesting to fans as the end of the season approaches. Therefore, we expect the later months of the season, February and March, to have more fans in attendance at games than earlier months of the season.

The last group of variables represents the key elements of this study, our measurements of uncertainty of outcome, team quality, and expected scoring. Our measure of uncertainty of outcome is the points spread, taken from betting market data. The points spread on college basketball games have generally been shown to optimal and unbiased forecasts of game outcomes. Therefore, this variable serves as a proxy for expectations about individual game outcomes. We model the uncertainty of outcome with the points spread in two ways. Rather than differentiating between favorites and underdogs with either negative values (representing home favorites) and positive values (representing road favorites), we choose to use the absolute value of the points spread as our measure of uncertainty of outcome, couple with a simple dummy variable for the existence of home favorites. The home favorite dummy captures that fans are likely to expect that the home team will win the game, while the absolute value of the points spread represents the expected closeness of the contest. Given that games with smaller points spreads could feature match-ups between two teams of high or low quality, the win percentage of the home team, going into that game, is included as an additional determinant.

To test if fans are more likely to attend games that are expected to be high-scoring, we include the betting market total as an independent variable. Scoring has been shown to be popular in many different sports, as the total has been shown to impact both attendance and

television ratings. If fans prefer games that are expected to be high-scoring, higher betting market totals should lead to more fans in attendance.

Regression results are presented in table 1 below. Coefficients are noted and t-stats are shown in parentheses. Statistical significance is denoted by *-notation with * being significant at the 10% level, ** being significant at the 5% level, and *** being significant at the 1% level. Table II gives a quick summary of the results, noting the independent variables that were found to have a statistically significant impact on attendance in a positive or negative fashion.

Table 1: Regression Results
Dependent Variable: Game Attendance

Independent Variable	Coefficient (t-stat)
Intercept	-13584.12*** (-2.7945)
Stadium Capacity	0.4232*** (11.4299)
Population	-0.0004*** (-3.4652)
Income Per Capita	-0.0589** (-2.3084)
Enrollment	0.3041*** (2.9760)
Enrollment Squared	-0.000008*** (-3.5397)
SAT Score Average	2.7934*** (2.7920)
Sunday	-143.1628 (-0.2293)
Monday	-148.8490 (-0.1932)
Tuesday	108.0661 (0.1750)
Thursday	-327.8931 (-0.4898)
Friday	86.1739 (0.0917)
Saturday	1597.165*** (2.9152)
December	863.0063 (0.4888)
January	2821.838 (1.4367)
February	3617.721* (1.8249)
March	5491.491***

	(2.6176)
Win Percentage	7465.365*** (4.1391)
Home Favorite Dummy	979.6954** (2.0552)
Pointsread (Absolute Value)	-100.5611** (-2.4501)
Total	42.8726** (1.9796)
R-squared	0.4642

Table II: Summary of Statistically Significant Variables in Attendance Model

Positive Effect on Attendance	Negative Effect on Attendance
Stadium Capacity	Population
College Enrollment	Income Per Capita
SAT Score Average	College Enrollment Squared
Saturday	Pointsread
Month of February	
Month of March	
Home Team Win Percentage	
Home Favorite Dummy Variable	
Las Vegas Total	

The model revealed mostly expected results as it relates to the control variables related to the home team college and surrounding area. The capacity of the stadium was shown to have a positive and significant effect on attendance. Larger venues appeared to be more popular for college basketball games than smaller venues. The population of the local area was shown to have a negative and significant effect on game attendance as was income per capita. Both of these statistically significant results likely stem from larger and wealthier cities are likely to have more entertainment possibilities available to their populations. College basketball appears to be an inferior good for the schools of the Big East, which include teams in the big cities of New York and Chicago, and more heavily populated areas also draw fewer fans to the stadium.

The enrollment of the college has a non-linear effect as it relates to college basketball game attendance. Larger colleges and universities attract greater crowds up to a point, then decline with very large institutions. Again, this is likely to be a function of substitution effects into other forms of entertainment. At smaller AQ (Division I) schools in the Big East, college basketball appears to be a prime draw for the students at the university. As the size of the college grows, however, more entertainment options are likely available to the students and attendance falls by a small, yet statistically significant, amount. SAT score was shown to have a positive and significant effect on attendance. Although relatively small, it appears that colleges with higher SAT scores draw a statistically significant number of additional fans. Basketball, at the Big East level, appears to be more popular the better the student body scored on its college aptitude test.

The days of the week and month of the season variables produced the anticipated results. Saturday was a very popular game for Big East basketball, with over 1500 more fans attending games on Saturday, compared to the omitted daily category of Wednesday. Attendance in college basketball was also shown to increase over the course of the season, with positive and significant effects on attendance seen in February and March. The nature of college basketball, with a regular season, followed by conference tournaments, followed by the highly-popular NCAA tournament, likely leads to these large increases in attendance at the end of the season as teams vie for championship tournament bids.

Fans of Big East college basketball also appear to be quite sensitive to the performance of the home team. Local fans appear to attend more games the better the team is performing. This is evidenced by the positive and significant effect of win percentage on attendance, with statistical significance at the 1% level.

In relation to the key variables for this study, the role of uncertainty of outcome and expected scoring, statistically significant results were found for each of the variables. The dummy variable for home favorites was positive and significant at the 1% level and led to 1440 additional fans in the arena if the home team was expected to win the game. The absolute value of the pointspread, our measure for uncertainty of outcome of the game, was found to have a negative and significant effect, also at the 1% level. Fans of Big East basketball appear to enjoy uncertainty of outcome in games as each additional point of the pointspread led to nearly 154 fewer fans in attendance. This result supports the uncertainty of outcome hypothesis, which has not been shown to be universal across sports. In addition, expected scoring appears to play an important effect when it comes to attendance for Big East basketball. For each additional point of the total, the betting market proxy for expected scoring in the game, 65 more fans attended the game. This result implies that fans of Big East basketball appear to prefer more scoring to less. To illustrate the marginal effects of both the pointspread and the total on attendance, table III shows a typical range of possible pointspreads and totals in typical college basketball games and notes the additional increase (or decrease) in attendance due to the magnitude of these variables (all else assumed equal).

Table III: Simple Illustration of the Marginal Effects of the Pointspread and Total on Attendance

Pointspread (Absolute Value)	Marginal Effect on Attendance	Total	Marginal Effect on Attendance
0	0	120	5145
5	-503	130	5573
10	-1006	140	6002
15	-1508	150	6431
20	-2011	160	6860

The results found in this study related to the uncertainty of outcome hypothesis are similar to those found in North America in studies of the National Football League (Welki and Zlatoper, 1999), Major League Baseball (Knowles, Sherony, and Halpert, 1992; Rascher, 1999), and the NBA (Rascher and Solmes, 2007) in that uncertainty of outcome improved attendance as the pointspread was found to have a negative and significant effect on attendance. This is different from other studies in North America where uncertainty of outcome was either found to

not impact attendance or where fans were found to prefer more certainty of outcome (i.e. Lemke, 2010; Mills and Fort, 2011). In other areas of the world, studies of sports such as soccer, rugby, and cricket found mixed results, depending upon league and country, in terms of the impact of uncertainty of outcome on attendance. These mixed results call for more studies of different sports in different countries to ascertain both the impact of uncertainty of outcome on attendance and to attempt to determine the reasons behind the considerable differences found within the uncertainty of outcome research.

In terms of the impact of scoring on attendance, the results appear to be more certain in terms of the sign and significance of the scoring variable. In addition to this study of college basketball, where the absolute value of the Las Vegas Total on the game was shown to have a positive and significant impact on attendance, similar findings where fans were also shown to prefer scoring when attending or watching games on television have been found in English soccer (Peel and Thomas, 1992) and in the National Football League (Paul and Weinbach, 2007).

IV. Conclusions

The role of uncertainty of outcome and expected scoring on attendance was investigated for Big East Conference college basketball. Fans of Big East basketball were shown to prefer uncertainty of outcome in their sport as the pointspread, our proxy for uncertainty of outcome, was shown to have a negative and significant effect on attendance. The betting market total on Big East basketball games, our proxy for expected scoring, was shown to have a positive and significant effect on attendance. This implies that fans of Big East basketball prefer seeing higher-scoring games compared to lower-scoring games and choose to purchase more tickets for games that are expected to be higher scoring.

In other results from the regression model, attendance was shown to increase based upon the win-loss record of the home team, fans preferred the home team to be expected to win the game (proxied by a home favorite dummy variable), weekend games were shown to be more popular than weekday games, and more fans attended games as the season approached "March Madness".

In relation to college and local area attributes, the size of the local population and local income per capita were shown to have a negative relationship with individual game attendance. These results likely stem from larger metropolitan areas which contain colleges in the Big East having more entertainment possibilities in relation to sports and other activities. Therefore, college basketball is revealed to be an inferior good in this sample as people substitute into other entertainment activities in larger and wealthier areas.

The enrollment at the university was determined to have a non-linear relationship with game attendance. As enrollment increases, more people attend college basketball games. There reaches a point, however, where larger universities see a decrease in attendance as the enrollment squared variable was shown to have a negative and significant effect. It is likely that this result also stems from other available entertainment opportunities on larger campuses compared to smaller campuses. As an interesting aside, average SAT score was shown to have a positive and significant effect on attendance for basketball. This result could state something about the types of fans who enjoy this sport and could make for an interesting avenue of future research.

Overall, the study of attendance for Big East college basketball was shown to support the uncertainty of outcome hypothesis. In addition, the notion that fans prefer more scoring to less was also confirmed in this sample. Potential avenues for future research in this sport include a

study of more conferences and colleges to attempt to determine if the impact of the uncertainty of outcome hypothesis is consistent across NCAA basketball. Further studies of college basketball, in addition to those in other sports, may help shed more light on the true role of the uncertainty of outcome hypothesis on attendance at sporting events.

References

- Buraimo, B. and Simmons, R. (2009) "A Tale of Two Audiences: Spectators, Television Viewers, and Outcome Uncertainty in Spanish Football." *Journal of Economics and Business*, 61, 326-338.
- Carmichael, F., Millington, J. and Simmons, R. (1999) "Elasticity of Demand for Rugby League Attendance and the Impact of 'BSkyB', *Applied Economics Letters*, 6(12): 797-800.
- Forrest, David and Simmons, Robert (2002) "Outcome Uncertainty and Attendance Demand in Sport: The Case of English Soccer." *The Statistician*, 51(2): 229-41.
- Forrest, David, Simmons, Robert, and Buraimo, Babatunde (2005) "Outcome Uncertainty and the Couch Potato Audience." *Scottish Journal of Political Economy*, 52 (4): 641-661.
- Knowles, Glenn, Sherony, Keith and Hauptert, Mike (1992), "The Demand for Major League Baseball: A Test of the Uncertainty of Outcome Hypothesis," *The American Economist*, 36(2), 72-80.
- Lemke, Robert J., Leonard, and Tlhokwane, Kelebogile (2010), "Estimating Attendance at Major League Baseball Games for the 2007 Season", *Journal of Sports Economics*, 11: 316-323.
- Mills, B. and Fort, R. (2011) "League Level Attendance and Outcome Uncertainty in the NBA, NFL, and NHL" Working Paper: University of Michigan.
- Morley, B., & Thomas, D. (2007). Attendance demand and core support: Evidence from limited-overs cricket. *Applied Economics*, 39, 2085–2097.
- Peel, David and Thomas, Dennis (1988). "Outcome Uncertainty and the Demand for Football: An Analysis of Match Uncertainties in the English Football League." *Scottish Journal of Political Economy*, 35 (3), pp. 242-249.
- Peel, David and Thomas, Dennis (1992). "The Demand for Football: Some Evidence on Outcome Uncertainty," *Empirical Economics*, 17(2), 323-331.
- Peel, David and Thomas, Dennis (1996). "Attendance Demand: An Investigation of Repeat Fixtures." *Applied Economics Letters*, 3: 391-394.
- Owen, D. and Weatherspoon, C. (2004) "Uncertainty of Outcome and Super 12 Rugby Union Attendance: Application of a General-to-Specific Modeling Strategy." *Journal of Sports Economics* 5: 347-370.
- Paul, Rodney J. and Weinbach, Andrew P. (2007) "The Uncertainty of Outcome and Scoring Effects on Nielsen Ratings for Monday Night Football." *Journal of Economics and Business* 59(3):199-211.

Rascher, D. (1999) "The Optimal Distribution of Talent in Major League Baseball." In L. Hadley, E. Gustafson, & J. Fizel (Eds.), *Sports Economics: Current Research* (pp. 27-54), Westport, CT: Praeger.

Rascher, D. and Solmer, J. (2007) "Do Fans Want Close Contests? A Test of the Uncertainty of Outcome Hypothesis in the National Basketball Association." Working paper. Available at SSRN: <http://ssrn.com/abstract=1690886>.

Theil, H. (1967) Economics and Information Theory, McGraw-Hill, Chicago.

Welki, Andrew M., and Zlatoper, Thomas J. (1999), "US Professional Football Game-Day Attendance," *Atlantic Economic Journal*, 27(3), 285-98.

Appendix I: Big East Schools 2008-09 to 2010-11

Team

Cincinnati Bearcats
Connecticut Huskies
DePaul Blue Demons
Georgetown Hoyas
Louisville Cardinals
Marquette Golden Eagles
Notre Dame Fighting Irish
Pittsburgh Panthers
Providence Friars
Rutgers Scarlet Knights
Seton Hall Pirates
South Florida Bulls
St. John's Red Storm
Syracuse Orange
Villanova Wildcats
West Virginia Mountaineers