

Analysis of Wisconsin Basketball

In this paper, I analyze a variety of data concerning NCAA basketball. Google Bigquery has a large college basketball database that contains information about specific programs, seasons, games, and players. Because I attended Boston College and Wisconsin, and Wisconsin has the much better basketball program, I decided to focus on Wisconsin and its performance over the years. While I was at Wisconsin, people had a generally positive outlook about the basketball team, but they haven't won a national championship since 1942¹. Now that I have data spanning the entirety of the program's history, I can see if Wisconsin basketball lives up to the hype.

Data Overview

For my analysis, I use the NCAA Basketball database available on Google Bigquery. To perform my SQL queries, I use Kaggle, which has a monthly data allowance for Bigquery². The NCAA Basketball database has a variety of information about programs, teams, and players. For my analysis, I observe the tables as part of three different categories: general information, historical information, and Sportsradar data. The general information tables contain information about the basketball programs, mascots, and team colors. The historical information tables contain information about seasons, games, and playoff games. Finally, the Sportsradar tables contain information about events that happen during particular games, e.g. the number of three point attempts in an arbitrary game. Analyzing all of this data should give a good sense of Wisconsin's basketball program and its level of success over the years.

¹https://www.wikiwand.com/en/Wisconsin_Badgers_men%27s_basketball

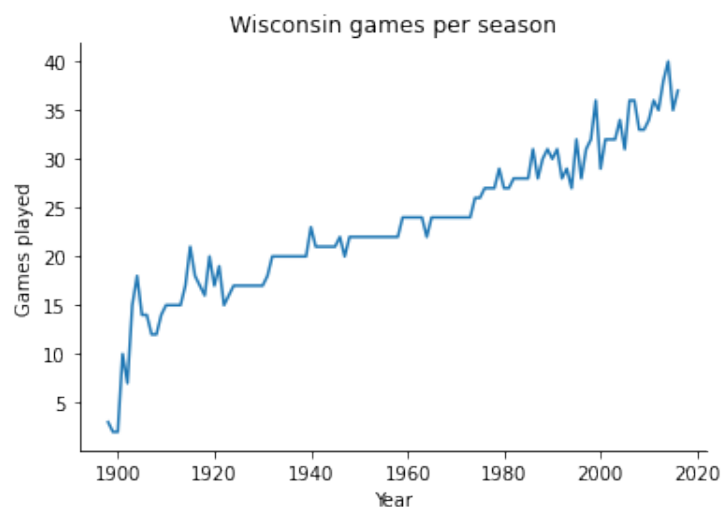
²For more information, see <https://www.kaggle.com/ncaa/ncaa-basketball>.

General Information

To begin, I analyzed the tables containing information about mascots, school colors, and school information. Although these don't give much information about Wisconsin's athletic performance, we can glean some basic information and perform some easy sanity checks. Not surprisingly, Bucky the Badger serves as Wisconsin's mascot. Although no other college has a badger mascot, five other teams have a mascot named Bucky, which makes it the most popular mascot name among the 351 total mascots. On a related note, 19 schools have a bulldog as a mascot, which makes it the most popular mascot by a large margin. From the team information table, we see that Wisconsin is a NCAA Men's Division I team playing in the Big Ten conference. They play at the Kohl Center, which has a capacity of 17,230. Three other D1 basketball teams play in Wisconsin, and Marquette has the largest stadium. Fourteen teams play in the Big Ten conference, and Wisconsin has the fifth largest venue in the conference.

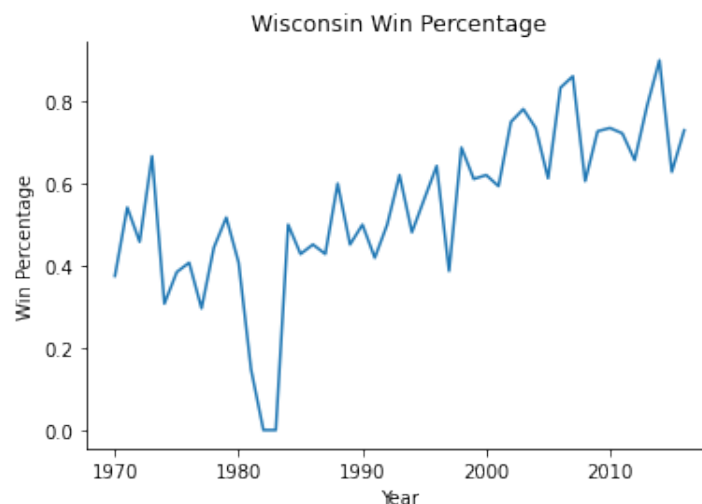
Historical Information

Figure 0.1: Games per season



The first historical table has information about Wisconsin's seasonal records dating from 1898 to 2016. During this time, Wisconsin had undefeated seasons in 1911 and 1913 and winless seasons in 1982 and 1983. From figure 0.1, we see that Wisconsin played relatively few games in the earlier years of its program (likely due to travel constraints), so I'm just going to look at data from 1970 onwards. Figure 0.2 shows Wisconsin's win percentage in this time. Wisconsin had an overall winrate of 54.4% and a maximum season winrate of 90%. The two winless seasons in 1982 and 1983 hurt their overall win percentage, but Wisconsin has been improving steadily and has had fairly consistent winning seasons since the mid 1990s.

Figure 0.2: Win Percentages



The second historical table has information about each regular season game from 1996 to 2016. In this time, Wisconsin had the most wins against Penn State with a total of 31. On average, Wisconsin scored 68 points and allowed 54 points in these games. During the same stretch, Wisconsin had the most losses against Michigan State with a total of 26. Wisconsin scored 52 points and allowed 63 on average when playing Michigan State. Figure 0.3 in the appendix shows seasonal averages for Wisconsin's offense and defense. Overall, Wisconsin scored 66 points and allowed 58 on average for their games in this time

period. Figure 0.4 in the appendix shows seasonal averages for attendance at Wisconsin's games. An average of 13,721 people attended Wisconsin's games from 1996 to 2016, but this number had significant variation season to season.

Table 0.1: Round Appearances

Round	Appearances
64	21
32	16
16	10
8	4
4	3
2	1

The final historical table has information about each playoff game ranging from 1984 to 2016. In these years, Wisconsin played 55 games and had an average seed of 5.22. Table 0.1 contains information about how many times Wisconsin appeared in each round. Wisconsin's only appearance in the final came in the year 2015, when they lost to Duke. Wisconsin's largest margin of victory in a playoff game was 40 points, and their largest margin of defeat was 30 points. Wisconsin had the most wins against Arizona (with 3) and most losses against Kentucky (with 2). Upsets happen when a lower seeded team beats a higher seeded team, and chokes happen when higher seeded teams lose to lower seeded teams. In total, Wisconsin had 8 upsets and 9 chokes.

Sportsradar Data

The first Sportsradar table has information about each individual play from games starting in the 2013-2014 season. Table 0.2 in the appendix contains counts of every event for Wisconsin in the database. Based off of their high count in this table, I'm going to take a look at Wisconsin's rebounds, two pointers, and three pointers at the game level. Over

the 179 games in the sample, Wisconsin averaged 34 rebounds, 17 two pointers, and 7 three pointers per game. During the same time, Wisconsin had game maximums of 53, 31, and 13 for rebounds, two pointers, and three pointers respectively.

The second Sportsradar table has detailed game level data for games starting in the 2013-2014 season. This table has more detailed attendance information, and we can see that two games against Kentucky and one against Duke had over 70,000 audience members³. This table also has more detailed information about the scores of each game. Wisconsin let up the most points in a 80-91 loss to Purdue. Wisconsin scored the most points in a 103-85 win against North Dakota, which was also Wisconsin's highest scoring game in general. Concerning, Wisconsin scored 17.53 two pointers per game and had a shooting percentage of 51.02. For three pointers, Wisconsin scored 7.17 per game and had a shooting percentage of 35.479. Two pointers and three pointers made up 49.54 and 30.42 percent of Wisconsin's offense respectively. This compares to 43 and 25.4 percent respectively across all collegiate programs. This shows that Wisconsin relied on three pointers for offense much more than the average college basketball team.

The final Sportsradar table has detailed information about individual players at the game level starting in the 2013-2014 season. Nigel Hayes, who currently plays in Europe, led Wisconsin in playtime, points, and assists during this stretch. During tournament games, Bronson Koenig, who currently plays in the NBA G league, led the Badgers in playtime and assists, but Nigel Hayes still had the most points. Of the top five players in points, the only current NBA player is Frank Kaminsky, who currently plays for the Phoenix suns.

³These games happened at AT&T stadium, home of the Dallas Cowboys, and Lucas Oil Stadium, home of the Indianapolis Colts.

Conclusion

In conclusion, Wisconsin appears to have a fairly strong basketball team. Although they have had a spotty overall history, Wisconsin has had strong performances and many tournament appearances since the mid 90's. However, Wisconsin has not had any NCAA tournament wins since 1942, so it would be hard to call it an elite program. Furthermore, not many recent Wisconsin basketball players currently play in the NBA, so the program may not do such a great job developing talents. In the future, I would like to expand this analysis by getting a higher data limit from Bigquery. This would allow me to both model how specific game events affect winning likelihoods and expand my analysis to more teams besides Wisconsin. Furthermore, I don't feel that this data necessarily does justice for how many players matriculate from programs to the NBA. Players take time to develop, and this dataset has a relatively small timeframe. Therefore, it would be helpful to have a longer reaching dataset concerning individual players for future analyses.

Appendix

Figure 0.3: Offense and Defense

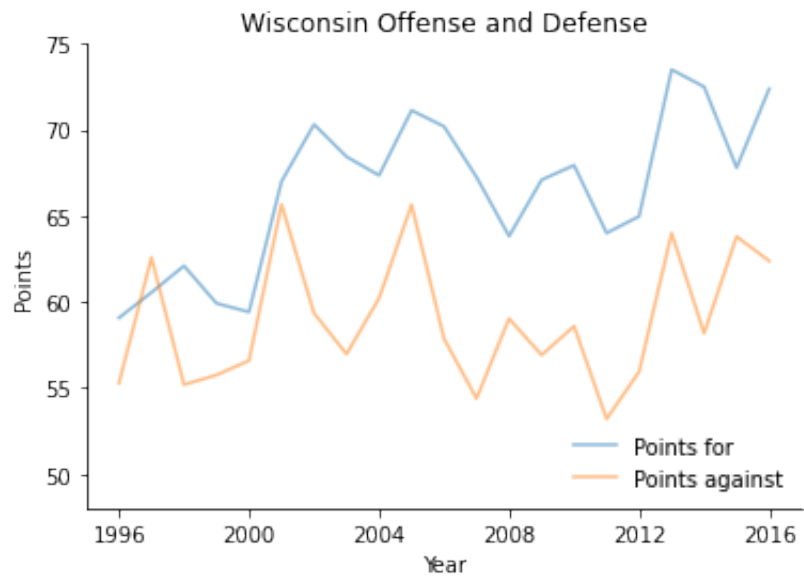


Figure 0.4: Attendance

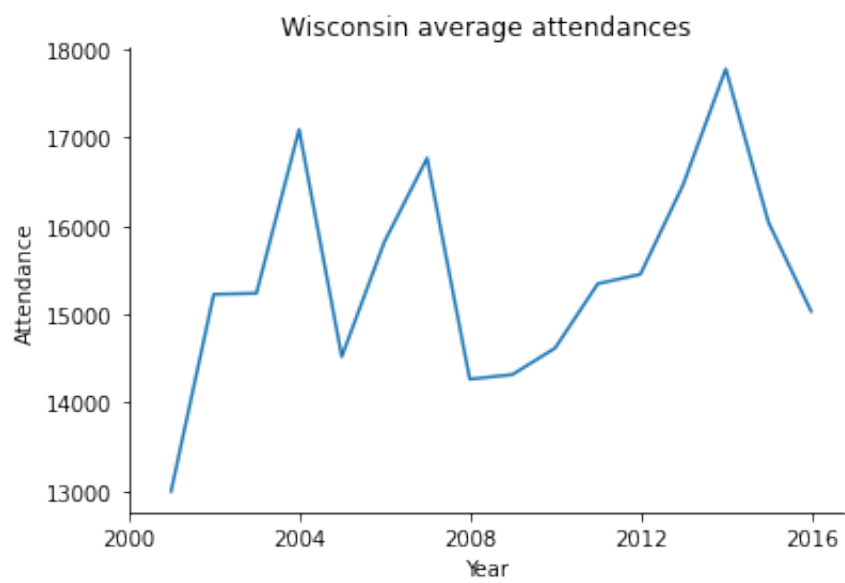


Table 0.2: Sportsradar Events

Event	Count
rebound	6125
twopointmade	3117
twopointmiss	3023
turnover	2661
freethrowmade	2543
threepointmiss	2297
assist	2223
personalfoul	1754
threepointmade	1283
shootingfoul	1182
freethrowmiss	1012
block	607
attemptblocked	535
offensivefoul	285
technicalfoul	20
lineupchange	18
teamtimeout	6
flagrantone	3
deadball	2
jumpball	1
openinbound	1
minortechnicalfoul	1
opentip	1