

Do the Pittsburgh Penguins have more wins at home or on the road?

Introduction

This is an observational study in which season statistics from randomly selected Pittsburgh Penguins' seasons were analyzed to determine whether the Penguins have more wins playing at home or on the road.

There is a certain superstition held among fans of all sports that teams are more likely to experience a win in their own stadium or arena than they are in other teams' stadiums or arenas. The intention of this study is to determine whether this superstition has in fact held true by examining ten different Pittsburgh Penguins regular hockey seasons. In each season, 41 games are played in the Penguin's home arena. Beginning in 2010, this home arena became the Consol Energy Center, but the Penguin's home was formerly the Civic Center.

Methodology

The population of this study includes all statistics regarding every recent Penguin win, loss, and—up until the 2005-06 season—tie both on the road and at home. The sample considered were fifteen randomly selected seasons from the 1967-68 season to the 2009-10 season, excluding the 2004-05 due to labor disputes that caused a lockout resulting in a lack of any Penguins games played during that specific season. Seasons were randomly selected using an online random number generator. This is a representative sample because it includes statistics from random seasons spanning the entire length of time the Penguins have played in the NHL.

The randomization of the sample accounts for the shifts, retirement, turnover, etc. of players over time, as players are often traded, injured, or become too advanced in age to continue playing hockey. The observational unit is the season, and the data used to compare the proportion of on the road wins to at home wins is the number of games won in each season.

The number of games won on the road in each season was divided by the total games played away from the Penguin's home arena in that specific season and this proportion (or percentage) was compared to the proportion of games won at home out of the total games played at home.

Data Exploration

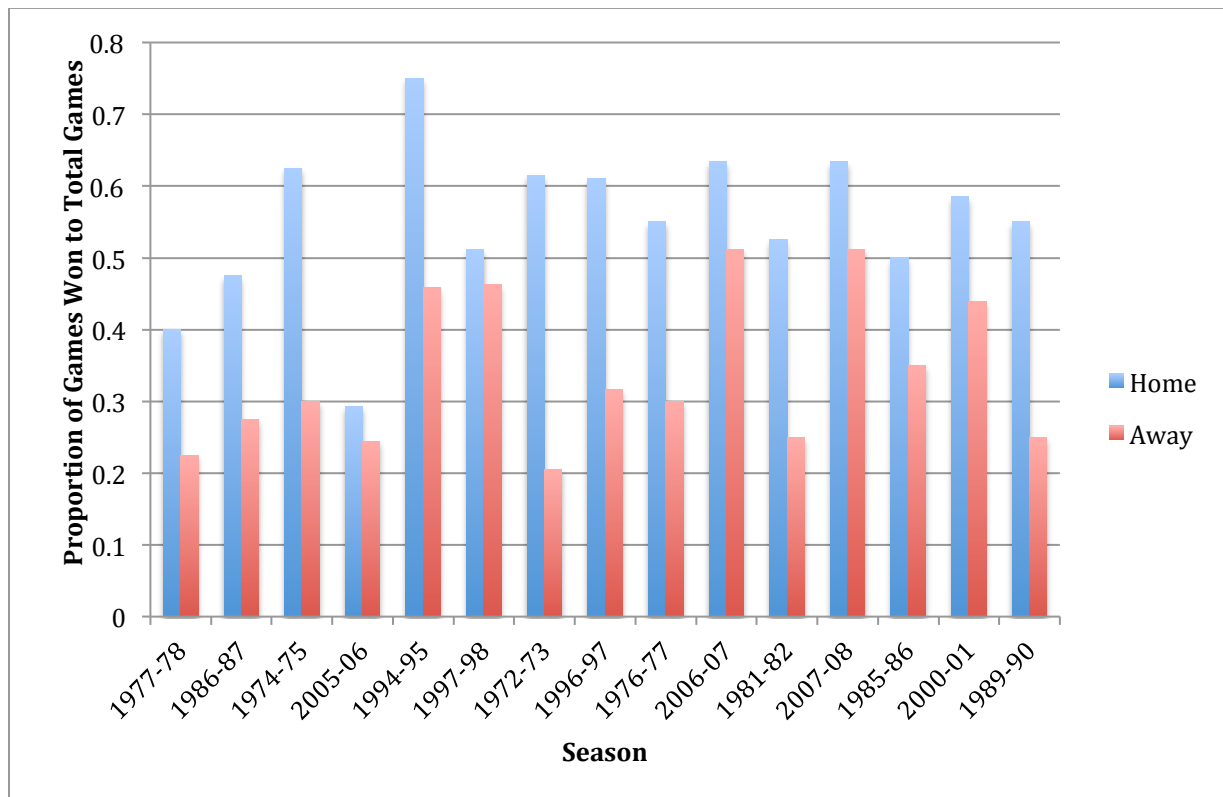


Figure 1: Proportions of Games won home and away to total number of games at home and away

Figure 1 demonstrates that in each randomly selected hockey season, there were more home games than away games won.

	Min	Q1	M	Q3	Max
Home Games	0.293	0.5	0.55	0.625	0.75
Away Games	0.205	0.25	0.3	0.458	0.512

Figure 2: The five number summary of the home and away game data

Figure 2 shows the five number summary of the proportion data for the home and away games played by the Penguins. Looking at this data, it is clear that the home games exhibit much higher proportional values than the away games, proving that the Penguins are generally more successful in home games than in away games. Or in other words, the Pens are more likely to win a home game than to win an away game.

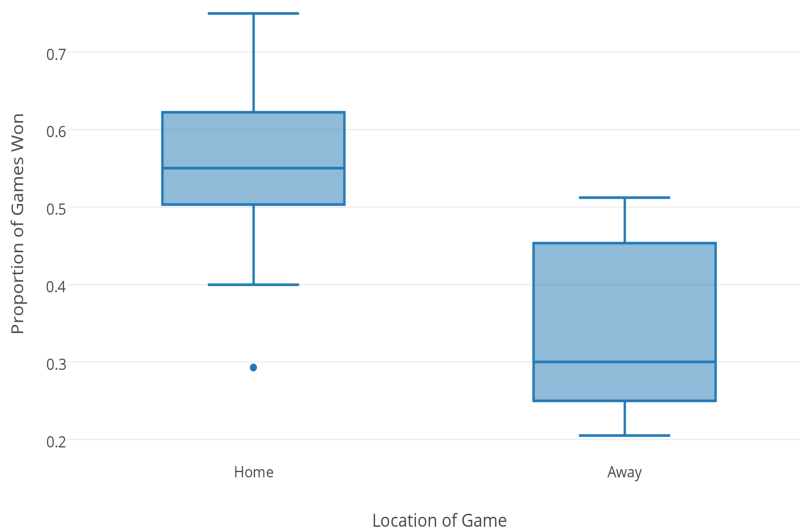


Figure 3: Box plot illustrating the five number summary of both the home and away games as well as revealing outliers.

Results

Season	Total Road Games	Road Games Won	Total Home Games	Home Games Won
1977-78	40	9	40	16
1986-87	40	11	40	19
1974-75	40	12	40	25
2005-06	41	10	41	12
1994-95	24	11	24	18
1997-98	41	19	41	21
1972-73	39	8	39	24
1996-97	41	13	41	25
1976-77	40	12	40	22
2006-07	41	21	41	26
1981-82	40	10	40	21
2007-08	41	21	41	26
1985-86	40	14	40	20
2000-01	41	18	41	24
1989-90	40	10	40	22

Example of Calculations

1977-78

9 (road games won) / 40 (total road games) = 0.225 (data point used)

16 (home games won) / 40 (total home games) = 0.4 (data point used)

Season	Proportion of Road Games Won	Proportion of Home Games Won
1977-78	0.225	0.4
1986-87	0.275	0.475
1974-75	0.3	0.625
2005-06	0.244	0.293
1994-95	0.458	0.75
1997-98	0.463	0.512
1972-73	0.205	0.615
1996-97	0.317	0.610
1976-77	0.3	0.55
2006-07	0.512	0.634
1981-82	0.25	0.525
2007-08	0.512	0.634
1985-86	0.35	0.5
2000-01	0.439	0.585
1989-90	0.25	0.55

Conclusion/ Future Study

It is fair to deduce from the results that the Penguins are more likely to win a home game than they are an away game. The reasons for this are not statistically clear, but we could assume that teams play better with the support of their fans in the arena they are accustomed to practicing in. In further study of this problem, it could be looked into which arenas the Penguins are most likely to lose in. It would also be a good idea to continue to monitor the home and road game win statistics in future seasons to see if this trend continues.