Traveling Between Parity and Fan Favorites
In the NCAA Basketball Tournament

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Abstract:

Like any successful cartel, the National Collegiate Athletic Association (NCAA) has had to respond to changing economic conditions in order to continue to exert control over its market. One such change the NCAA has made was implementing the so-called “pod system” method of assigning teams to their first-round games in 2002. The system game the NCAA a degree of freedom regarding the placement of teams in the tournament’s opening round. Since implementing the pod system, the NCAA has been more likely to assign highly seeded, more popular teams to play opening round games in their home state, an advantage we estimate is worth about four points per game, and reduced significantly the average travel burden for highly seeded teams. Despite the reduction in uncertainty of the first-round games, attendance at these contests has increased more than 10%, a finding that is consistent with other studies that relate attendance of sporting contests to uncertainty levels of such contests.

We conclude that the NCAA has used the pod system to perpetuate the status quo in the sport, a finding discussed in Eckard (1998) regarding NCAA football. Our work has larger implications about the market for education in the US, as alumni support and student interest both are related to schools’ performances on the athletic fields.
Introduction

The notion that the National Collegiate Athletic Association (NCAA) is a cartel is not a new one. The methods the organization has employed to retain control of the inputs and outputs of the products and services it creates has been discussed as far back as Koch (1973) and more recently (and more famously) by Taylor Branch. Like any cartel, the NCAA needs to be flexible in responding to changes in its economic order so that it can remain successful at exerting control over the services it produces.

Since the early 1980s, the NCAA has had to respond to two changes that have threatened the value of its crown jewel- the annual Division I Men’s basketball tournament. The vast changes to the television and communications industries that have occurred in the last 30 years have provided alternatives to watching the tournament to many potential fans, while simultaneously opening new avenues for broadcasting the tournament games. Additionally, an important input to the production of the tournament-elite, college-age basketball players- have increasingly found ways to bypass the college game for the professional ranks. In response to these changes, the NCAA changed the way that it organizes its tournament by adopting in 2002 the so-called “pod system.”

This paper explores the way the NCAA has used this new system to assign participating teams to their first round games. We show that the tournament selection committee (the Committee), a uniquely powerful entity in the sports world, has used the added freedom granted by the use of the pod system to give highly seeded teams an easier path to the second-round of the tournament, which has maintained the sport’s status quo while simultaneously increasing attendance at tournament games. Our findings are
consistent with previous studies of cartel decision making and of attendance at sporting events.

**Cartels Such As the NCAA Must Allow for Flexible Decision Making**

In their study of successful cartels, Levenstein and Suslow (2006) highlight the importance of a successful cartel being organized in such a way that it has the ability to be flexible when economic conditions start to change. Their finding is instructive to our study because the NCAA Division I men’s basketball tournament is a unique sporting event that is as popular as almost any other annual competition held in North America. Yet, in the last 30 years, it has had to respond to massive changes to the television and communications industry and to the erosion of its ability to attract the best young basketball players to its teams. These changes have been existential threats not only to college basketball, but also to the NCAA itself, as the tournament is its most valuable asset.

Consider that in 1985, the average household only had available to it 19 channels to watch. By 2009, that same figure stood at 118 channels. Needless to say, these changes presented the NCAA with challenges and opportunities. Potential viewers have faced more choices with which they could substitute viewing tournament games, but the technology has provided the NCAA with new opportunities to scale its presentation of the tournament to an ever expanding audience. Based upon the value of the contracts the NCAA has signed with Columbia Broadcasting Systems (CBS) to broadcast exclusively the tournament, the organization has handled these changes well. In 1987, the NCAA sold broadcasting rights for $58 million per year. By 1999, the rights were sold for roughly $450 million per year. In 2010, the NCAA collected about $785 million per year from
CBS and Turner Networks for broadcasting rights. About 80% of all revenues earned by the NCAA in 2011 are from this most recent contract. Based on this fact, one can imagine easily that the NCAA wants to keep its broadcasting customers satisfied with the way the tournament is presented.

Evidently, the value of the tournament has not been driven by interest in the national championship game, as the number of viewers of that event has declined steadily since 1992, when roughly 35 million people watched Duke University best the University of Michigan in the national final. By 2012, only 20.9 million viewers watched the final between the University of Kentucky and the University of Kansas. So, the tournament final is not the cultural event (or money maker) on par with the Super Bowl for the NFL. Instead, the increased value for broadcasting the tournament is likely a function of technological advances that enabled the NCAA in 2011 to broadcast all of the tournament’s games, a feat that probably seemed dizzyingly impossible 20 years ago, when only a handful of tournament games were not shown to regional audiences.

We feel that the NCAA’s impetus to adjust the way it organizes the opening round of the tournament partly came from these technological innovations. Unfortunately, the time series on television ratings in the first-round is short, but if television ratings for the championship game are indicative about what drives interest in early round games, then the NCAA understood well that doing something to keep popular teams in the tournament would enhance the value of the broadcast rights to the entire tournament. Consider that in the 21 tournament finals played between 1992 and 2012, the size of the audience is 9.5% larger when at least one of the participants was one of the four number one seeds in the tournament. In the final game of the tournament, casual fans
prefer to watch the best, most popular teams, and we believe that relationship holds in early round contests, too. So, if the NCAA is to keep its partners happy and revenues large, it needs to walk the line between creating uncertainty of its games and aiding college basketball’s most popular teams, a trade-off discussed and analyzed many times in sports economics literature.

The second change that altered the state of the tournament affected the inputs the NCAA uses to produce the tournament— the players. Since the early 1990s, there was a pronounced increase in the likelihood that the upper echelon amateur player would either skip college entirely for the professional ranks or would leave before his eligibility was exhausted. A comparison of the 1992 National Basketball Association draft to the 2001 draft is illustrative of this phenomenon. In 1992, all but four of the top 27 players selected in the first-round of the draft had played in college for the entire four years for which they were eligible. By the 2001 draft, the draft held before the pod system was implemented, only five of the 28 first-round selections had played all four years in college. Additionally, in 1992, all players selected in the first-round had played at an NCAA-member school, while in 2001, only 19 of the 28 first-round selections competed for an NCAA-member school. So, not only was the NCAA forced to change how it presented the tournament, but it also had to come to grips with the loss of control of its top-tier players.

As per Levenstein and Suslow (2006), the NCAA needed to be flexible in how it dealt with these changes in order to protect the value of its crown jewel. Enter in 2002 the pod system, a brilliant alteration to the way the tournament was organized. The pod system freed the Committee from a constraint that mandates where similarly situated
teams played their first-round game of the tournament and increased again the unique power that the Committee has in the sports world. To understand the extent to which the pod system enhanced the power of an already powerful tournament selection committee, we need to compare the old system of how the tournament was organized to the pod system.

**The Pod System Changes the Tournament’s Organizational Structure**

The tournament started in 1939 and has been played annually since. Generally, the changes to the tournament have been about size, as more and more teams have been invited since the first tournament. By 1985, the first year of interest of our study, the tournament had grown to 64 teams, about half of which qualified automatically by winning either their conference’s regular season or postseason tournament. The other half of the field receives invitations from the Committee, a group that consists of representatives from NCAA-member schools or conference administrators. Once the tournament field is determined, the Committee assigns opponents for each team and determines at which of the eight pre-determined sites games will be played. Teams are then divided into four regions that consist of 16 teams. During the opening four days of the tournament, 32 first-round games and 16 second-round games are played at the eight sites. Four teams from each of the four regions then play in the regional semifinals and, potentially, finals to determine which four teams advance to the national semifinals and, potentially, the national final.¹

The Committee ranks all tournament teams from one to 64 according to a quality measure that the NCAA does not explicitly share with the public. A team’s rank

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¹ The tournament has included 64 teams since 1985. There has been a “play-in” pre-tournament game since 2001. Our empirical analysis excludes these pre-tournament “play-in” games.
determines its “seed line” from one to sixteen. For example, the teams ranked one through four nationally are on the first seed line, the teams ranked five through eight are on the second seed line, and so on. A team is typically assigned the seed corresponding to its seed line, but the Committee may move a team from its seed line in order to preserve other goals of the structuring process. Because of the constraints the Committee faces, in the first-round a team will either have to play a team that is of higher or lower quality compared to the quality of team they would play in a perfectly symmetrical contest. Couple the freedom to rate teams with the freedom to place teams at various locations and one can imagine easily the tempest that is created every March when the tournament field is announced.

From 1985, the year the field expanded to 64 teams, to 2002, the Committee mandated that all eight teams competing in one of the eight first-round sites be from the same region. Since the 2002 tournament, when the pod system was adopted, the Committee has been allowed to place mix teams from different regions in the same first-round sites. Now, teams from two regions can compete at the same site. Like other instances in which a constraint is lifted, the pod system innovation allowed the Committee greater flexibility in assigning teams to the sites where their first and second round games would be played.

To illustrate the difference in the Committee’s decision making across the pre-pod and pod systems, consider the assignments given to Indiana University and Purdue

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2 Some of these goals include not allowing a team to play in their home arena, a practice that ended in 1988 and stands in contrast to other NCAA tournaments, and avoiding pitting teams from the same conference against one another until the third round of the tournament.

3 The popular press also talks about the possibility. For an example of such commentary, see sportswriter Jason Whitlock’s discussion of Duke University’s 2010 tournament assignment at http://www.kansascity.com/2010/03/13/1813273/ncaa-caves-to-tv-pressure-by-going.html.
University in 1987 and the assignments for the University of North Carolina and Duke University in 2009. The pair of 1987 teams split their two regular season meetings and tied for the Big Ten conference championship. Indiana, the team the NCAA Selection Committee deemed to be the stronger of the two teams, was assigned a number one seed in the Midwest region. Indiana played its first-round and second-round games in Indianapolis, 45 minutes from its campus. Purdue was assigned to the Syracuse, N.Y. tournament site in the East region, which is 700 miles from its campus. In comparison, the 2009 Duke team, which won the Atlantic Coast Conference’s postseason tournament, was seeded second in the East region. The North Carolina team, which won the regular season conference championship, was seeded first in the South region. Unlike Indiana and Purdue in 1987, the pod system allowed for the NCAA to assign both Duke and North Carolina to play opening round games in Greensboro, NC, about an hour from either campus. Prior to the adoption of the pod system, only one team (typically the strongest) in a given geographic area could expect to earn the plum assignment of playing relatively close to campus. Without the pod system either Duke or North Carolina in 2009 would have suffered the same fate as Purdue in 1987 and been assigned to a far-flung tournament site.

Armed with the pod system and increased freedom in determining first-round match-ups, the Committee is a powerful entity in the college basketball world, but it still faces the trade-off between satisfying fans’ desires and creating contests with uncertainty when it determines a tournament’s structure. This trade-off is the age old question posed by Neale (1964) and explored by Fort and Quirk (1995), Schmidt and Berri (2001), and Rascher (1999). Szymanski (2003) generalized that demand to attend sporting events
peaks when the home team has about a 2-in-3 chance of winning the contest. We find this relationship instructive to our study in that we find the NCAA has used the pod system to move away from creating an environment that is conducive to uncertainty. So, striking the right balance is critical to the tournament organizers as demand to consume the competition produced by the tournament will change, given the side they choose. As we discuss below, for the NCAA, increases in its ability to broadcast its tournament meant that it was profit-maximizing for it to tip the balance of its tournament in the favor of teams that would drive up demand to watch the tournament, both in the arena and beyond.

**Empirical Analysis of the Selection Committee’s Use of the Pod System**

Above, we have described the relatively large amount of freedom that the Committee has in shaping the opening round of the tournament and how that freedom expanded after the pod system was implemented. Our goal in this section is to determine what the Committee has done with that freedom over the last 28 tournaments. We collected results from 28 years of first-round contests (1985-2012) and 32 years of regular season attendance data (1981-2012) in hopes of determining the extent to which the Committee has altered the way it assigns teams to first-round games, the effect that any changes have had on the relative levels of uncertainty and attendance of first-round games, and the knowledge the NCAA had with regards to these effects when it implemented the pod system in 2002.

The Committee decides the teams that will play each other and where those games will occur and is on record that it ranks all participants by relative quality in order
to create a field that is as close as possible to symmetric in terms of quality. A perfectly symmetric field would pit the top-ranked team against the sixty-fourth ranked team, the second ranked team against the sixty-third ranked team, and so on. Given the constraints regarding which teams can play one another in first-round games and where first-round games can occur, it is unreasonable to assume that the Committee could create a perfectly symmetric field.

Once the field ranking is complete and teams are placed on seed lines and assigned a location to play, the Committee unveils its tournament selections to public once it has assigned participating teams to a seed line and location. For each game from teams’ seed lines, we calculate $seed_{\text{difference}}_{gy} = seed_{\text{high,}gy} - seed_{\text{low,}gy}$, a variable for measuring team quality differences, where $g = \text{game}$, $y = \text{year}$, $h = \text{high-seed team in game}$, and $y = \text{low-seed team in game}$.

Because the Committee does not share its complete tournament field rankings with the public, we have no way of knowing how it arrived at the seeds that it chose. To measure team quality in an alternative way, we use a well-known quality measure called the ratings percentage index (RPI) to judge how closely the Committee adhered to a symmetry standard. The RPI has been published at the end of the each of the 28 years that comprise our tournament data, so for each of the 28 tournaments in the dataset, we rank teams from 1 to 64 for every tournament with their RPI measure and then group teams by four to create a variable we call $RPI\ seed_{\text{high,}gy}$ (or $RPI\ seed_{\text{low,}gy}$), a measure that is analogous to the Committee’s seed line. Teams ranked one through four by the RPI have

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4 The Committee has never shared its complete field rankings with the public.
5 This method is also known as the “S-curve” method of assigning teams to their tournament games.
6 The RPI is a weighted average of a team’s winning percentage, the average of a team’s opponents’ winning percentages, and average of the opponents’ opponents’ winning percentages. The first and last parts are each given a 25% weight, and the middle portion accounts for the remaining 50% of the statistic.
an RPI seed = 1, teams ranked two through eight have an RPI seed = 2, and so on. For all teams in a tournament, we calculate quality difference$_{hgy} = RPI \ seed_{hgy} - seed_{hgy}$, or quality difference$_{lgy} = RPI \ seed_{lgy} - seed_{lgy}$, depending upon a team’s relative seed line in a game. If a team received an NCAA seed that was higher than the seed that would have been given had RPI been used, then quality difference > 0 and is illustrative of an instance in which the NCAA believed a team to be superior to its RPI ranking.7

Inflating or deflating a team’s relative ranking would not matter very much, so long as the Committee did the same for a team’s opponent’s relative ranking. However, if the Committee was to inflate a team’s seeding and not make a corresponding change to its opponent’s seeding, then it is either deviating from the RPI or giving a team an advantageous first-round assignment (or tournament), an accusation often lobbed at the Committee. To determine the extent to which the Committee deviated from the RPI seeds for only one participant in a first-round game, we calculate seed advantage$_{gy} = quality \ difference_{hgy} - quality \ difference_{lgy}$.8 If seed advantage > 0, then we conclude that the Committee gave the higher-seeded team an advantage in its first-round assignment relative to the assignment that would have been made using the RPI.

We show the distribution of seed advantage in figure 1. Note that in the pod era about 60% of all games matched the RPI predictions within one seed. This percentage is slightly higher than it was during the pre-pod era, which suggests that the loosening of

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7 Villanova University’s 1985 national championship team was seeded eighth by the Committee that year. According to the RPI, it should have been seeded third.

8 Seed advantage$_{gy} = (RPI \ Seed_{hgy} - RPI \ Seed_{lgy}) - (Seed_{hgy} - Seed_{lgy})$. 

12
the geographic constraint in the pod era has enabled the NCAA to get closer to creating a symmetric field in the opening round of the tournament.9

The second and arguably most powerful part of the Committee’s decision-making process is determining where teams will play their first-round games. Inevitably a few teams’ campuses are close to one of the eight first-round sites, so it is reasonable to assume that the Committee would take advantage of the opportunity to ease travel burdens and assign a team to play near their campus. It is also inevitable that some teams will have to travel long distances to a first-round game because there are only eight sites hosting such games, and the distribution of team quality across the US cannot possibly match the way sites are spread across country. So, the Committee can try as hard as it wants, but in the end, it is most likely going to have teams playing far from home in order to create a field that is as symmetric as possible in terms of quality.10

We measure travel differences in two different ways. The first measure is the difference in the number of miles that the higher-seeded team had to travel to a first-round site compared to their lower-seeded opponent. We call this variable \textit{travel}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{distribution_of_seed_advantage_across_eras}
\caption{Distribution of Seed Advantage Across Eras}
\end{figure}

\begin{itemize}
\item[9] We organized \textit{seed advantage} into the groups seen in the chart, even though there were occasions in which the measure exceeded four and was smaller than -4.
\item[10] Indeed, the tournament field was once constructed along strict geographic lines. The Committee abandoned this practice for quality concerns.
\end{itemize}
difference, which is less than zero if the distance the lower-seeded team had to travel was greater than the distance the higher-seeded team had to travel. The second measure is to highlight instances in which a team was assigned to play a first-round game in the same state in which their campus is located. We call this binary variable in-state and assign it a value of one if a team plays in their home state and zero otherwise.

The evidence we present in tables 1 and 2 shows that the Committee has altered dramatically the way it forces teams to travel to their first-round games since the pod system was developed, because high seeds have had to shoulder less of the travel burden since the pod system was implemented.11 Prior to the implementation of the pod system, travel difference was distributed more uniformly across seeds compared to the pod era. Since the Committee implemented the pod system, the highest four seeds in each region have been able to play much closer to home, as the average of travel distance is significantly smaller for the highest seeds in the pod era relative to the pre-pod era. The average for the other seeds has not changed significantly since 2002.

The Committee also has shown considerable bias towards the highest seeded teams in each region in the pod system era when it comes to giving in-state assignments. Table 2 shows that the likelihood that a team received an in-state assignment has increased in the pod era, but only for the highest seeded teams in each region. The likelihood that a team seeded below 12th in a region has become virtually zero in the pod era.

That the Committee has favored the highest seeds in the pod era with improved travel assignments is obvious. But has the Committee’s change of heart affected the

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11 When the pod system was presented, Lee Fowler, the tournament committee chair in 2002, said, “If there’s any way we’ll keep them [teams] closer to home, we’ll do that, too.” Our evidence suggests that the Committee has not taken his words to heart.
outcomes and demand to watch first-round games? By answering this question, we can

gain a better understanding of the Committee’s perceptions of the trade-off between

parity and catering to fans’ preferences.

Table 1- The Committee Has Assigned Highest Seeds

Closer to Home in Pod Era (in miles)

<table>
<thead>
<tr>
<th>Seed</th>
<th>Pre-Pod Travel Difference (68 Games)</th>
<th>Pod Travel Distance (44 Games)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-220.2</td>
<td>-374.3</td>
</tr>
<tr>
<td>2</td>
<td>-68.3</td>
<td>-463.3</td>
</tr>
<tr>
<td>3</td>
<td>173.8</td>
<td>-313.0</td>
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<tr>
<td>4</td>
<td>101.8</td>
<td>-99.9</td>
</tr>
<tr>
<td>5</td>
<td>-155.5</td>
<td>118.8</td>
</tr>
<tr>
<td>6</td>
<td>-68.4</td>
<td>113.6</td>
</tr>
<tr>
<td>7</td>
<td>47.8</td>
<td>193.9</td>
</tr>
<tr>
<td>8</td>
<td>27.3</td>
<td>255.5</td>
</tr>
</tbody>
</table>

Table 2- The Committee Has Given Higher-Seeds

More In-State Assignments in Pod Era

<table>
<thead>
<tr>
<th>Seed</th>
<th>In-State Assignments (Pre-Pod)</th>
<th>In-State Assignments (Pod)</th>
<th>In-State Assignment Opportunities (Pre-Pod)</th>
<th>In-State Assignment Opportunities (Pod)</th>
<th>Probability In-State Assignment (Pre-Pod)</th>
<th>Probability In-State Assignment (Pod)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>15</td>
<td>20</td>
<td>18</td>
<td>0.8</td>
<td>0.83</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>11</td>
<td>20</td>
<td>15</td>
<td>0.4</td>
<td>0.73</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>4</td>
<td>18</td>
<td>11</td>
<td>0.22</td>
<td>0.36</td>
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<tr>
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<td>4</td>
<td>17</td>
<td>12</td>
<td>0.12</td>
<td>0.33</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>1</td>
<td>14</td>
<td>10</td>
<td>0</td>
<td>0.10</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>5</td>
<td>13</td>
<td>14</td>
<td>0.23</td>
<td>0.36</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>0</td>
<td>16</td>
<td>9</td>
<td>0.13</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>1</td>
<td>16</td>
<td>9</td>
<td>0</td>
<td>0.11</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
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<td>16</td>
<td>12</td>
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<td>0.08</td>
</tr>
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<td>14</td>
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<td>12</td>
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<td>14</td>
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<td>0</td>
</tr>
<tr>
<td>13</td>
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<td>9</td>
<td>0.24</td>
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<tr>
<td>15</td>
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<tr>
<td>16</td>
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<td>2</td>
<td>13</td>
<td>8</td>
<td>0.38</td>
<td>0.25</td>
</tr>
</tbody>
</table>
First, in the pod era, the winning percentage of the highest seeded teams is significantly higher than it was in the pre-pod era, which suggests that the Committee’s changes in assigning teams to first-round games has impacted the results of the tournament. For instance, the winning percentage in the 544 first-round games that featured a team seeded in the top four in a region between 1985 and 2001 was 88.6%, which is 4.0% lower than the 92.6% winning percentage of the same seeds in the 176 games played by similar teams in the pod era. So, in the simple terms of wins and losses, the evidence suggests that the Committee’s favoritism of higher seeds has affected the first-round of the tournament.

Instead of focusing on wins and losses, we instead measure the relative uncertainty of first-round games by calculating, for each game in every tournament, the variable point difference, which is the difference in the number of points the higher-seeded team and lower-seeded team scored in a given game. This measure is positive if the higher-seeded team won a game. In the 544 first-round games played between 1985 and 2001, the mean of point difference is 9.29. The mean has fallen to 8.98 in the pod era.

We then use a linear regression model to examine how point difference was affected by various characteristics of the tournament games. In our model, the game characteristics are the two aforementioned quality variables, seed difference, and seed advantage, and the two location variables, in-state and travel difference. We interact these variables with a pod indicator variable in order to perform a differences-in-differences calculation across the two pod regimes.

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12 The difference in the winning percentages of the top three seeds is larger than the difference of the top four seeds. The top three seeds won 91.7% of their games in the pre-pod era and 97.9% of their games in the pod era.
Regression Model:

\[
Point\ Difference_{gy} = \mu + \beta_1\ Seed\ Difference_{gy} + \beta_2\ Seed\ Advantage_{gy} + \\
\beta_3\ Travel\ Difference_{gy} + \beta_4\ In-State\ Dummy_{gy} + \\
\beta_5 Pod\ Dummy_{gy} + \beta_6\ Pod\ Interactions_{gy} + \epsilon_{gy}.
\]

Assume \(\epsilon_{gy}\) to be a mean zero error term.

The right column of table 3 contains regression results. With regards to our team quality measures, note that, unsurprisingly, seed difference is a very strong indicator of the competitiveness of a game. The coefficient value on that variable, which is measured very precisely, is -1.70. This result allows us to estimate that that as seed difference increases by two, we would expect for the difference between the scores of the two teams to for every decrease by 3.40 points. So, the expected value of point difference in pre-pod games between a team seeded fourth in a region and 13th in a region was 16.1 points.

Also note the coefficient on seed advantage is less than zero, so a game’s relative level of competitiveness is inversely related to any advantage given to a team by the Committee. Maybe the Committee might not be so good at determining when to deviate from RPI.

Finally, note that the team quality variables are not measured precisely when interacted with pod. This finding suggests that during the pod era, the Committee’s decisions regarding team quality have not impacted games differently across the two regimes.

With regards to our travel measures, we find important the lack of significance in either of the travel variables, travel distance or in-state dummy. Evidently, traveling long distances does not affect über-athletic 20 year-olds the way that it might affect the rest of the population. However, the lack of significance of in-state dummy is interesting in light of the significance of the variable formed by the interaction of pod dummy and in-state dummy. This difference highlights the Committee’s change in strategy regarding the use of the in-state assignment, after the pod system was implemented. Before the pod system,
highly seeded teams were just as likely as lower-seeds to receive this assignment. Since the pod system was implemented, in-state assignments have been given almost exclusively to teams seeded very highly in their respective region, and so the value of the interacted variable is picking up the change in the Committee’s behavior.

Table 3- The Selection Committee Understood Importance of In-State Assignments before Pod System Implemented

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Model 1 Estimates (standard error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-4.09 (0.97)</td>
</tr>
<tr>
<td>Seed Difference</td>
<td>-1.70 (0.11)</td>
</tr>
<tr>
<td>Seed Advantage</td>
<td>-0.46 (0.23)</td>
</tr>
<tr>
<td>Travel Difference</td>
<td>-0.001 (0.001)</td>
</tr>
<tr>
<td>In-State Dummy</td>
<td>0.51 (1.50)</td>
</tr>
<tr>
<td>High-Seed In-State Dummy</td>
<td>N/A</td>
</tr>
<tr>
<td>Pod</td>
<td>1.54 (1.58)</td>
</tr>
<tr>
<td>Pod*Seed Difference</td>
<td>0.31 (0.17)</td>
</tr>
<tr>
<td>Pod*Seed Advantage</td>
<td>0.10 (0.38)</td>
</tr>
<tr>
<td>Pod*Travel Difference</td>
<td>-0.001 (0.01)</td>
</tr>
<tr>
<td>Pod*In-State Dummy</td>
<td>4.18 (2.38)</td>
</tr>
<tr>
<td>Pod*High-Seed In-State Dummy</td>
<td>N/A</td>
</tr>
</tbody>
</table>

R-sq = 0.3200, N = 896

So, did the Committee have a hunch as to the value of an in-state assignment before the pod system? Simple summary statistics suggest as much. Consider that the average of point difference in the 509 games played in the pre-pod era that did not feature the higher seeded team playing in their home state was 8.57 points. This number stand in contrast to the 15.42 point per game average of point difference in the 35 games in which the higher seeded team did play in their home state. Based on this evidence, it is hard to argue that the Committee did not understand the value of an in-state assignment prior to the implementation of the pod system. The Committee has acted on their knowledge in
the pod system era by doling out these valuable assignments almost exclusively to higher seeded teams.

Thus far, we have established that in the pod era the Committee has given higher seeded teams more in-state assignments relative to their lower seeded opponents and that before the pod system was implemented the Committee had evidence of the value of such assignments for highly seeded teams. So, what types of programs receive high seeds in tournaments? Are these teams mostly popular programs that have the strongest opportunity to exert control over the NCAA and its tournament? Or do smaller programs receive high seeds, too? Answering these questions allows for us to understand how the Committee’s change in using this gem of an assignment has either perpetuated the established teams of college basketball or has allowed for smaller programs to be more likely to reach the later rounds of the tournament.

To estimate a program’s popularity, we collected attendance data on all Division I teams, from 1981 to 2012 from the NCAA’s records. From these data, we calculated a five-year running average of attendance of total season attendance for the home games each team played and a five-year running average of average attendance per home game. We assume that the larger is either of these metrics, the more popular is the program.

First, the simplest evidence linking the likelihood of an in-state assignment and a program’s size is to correlate first-round seed and the ranking of attendance amongst the teams in the tournament each year. Table 4 shows the correlations using both types of attendance metrics. Note that a team’s attendance ranking and its seed are highly correlated, suggesting that in the pod era, in-state assignments are going to college basketball’s most popular teams.
Table 4- A Team’s Seed and Its Popularity Are Highly Correlated

<table>
<thead>
<tr>
<th></th>
<th>Correlation to Seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranking of Total Attendance Last Five Seasons</td>
<td>0.682</td>
</tr>
<tr>
<td>Ranking of Average Per Game Attendance Last Five Seasons</td>
<td>0.676</td>
</tr>
</tbody>
</table>

Second, we separate tournament teams into quartiles based upon their rankings of their five-year attendance total and five-year per game averages. We then counted the number of in-state assignments given to teams in each quartile in both the pre-pod and pod eras. These results are shown in table 5. Note that these results mirror closely the results in table 2. In the pod era, the teams with the largest fan bases (also the teams most likely to be a high seed) are receiving most of the in-state assignments.

Table 5- In-State Assignments Given to Popular Teams in Pod Era

<table>
<thead>
<tr>
<th>Quartile of Total Attendance Ranking</th>
<th>Number of In-State Assignments in Pre-Pod Era</th>
<th>Number of In-State Assignments in Pod Era</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Second</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Third</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Fourth</td>
<td>18</td>
<td>5</td>
</tr>
</tbody>
</table>

Based upon the regression results and the results in table 4 and 5, it is obvious that the Committee had a good idea that they would be helping popular programs with the use of the in-state assignment when they changed how the assignment is allocated. Our view as to why the advantage exists is tied to popular teams being able to invest in playing games off-campus at venues that will host NCAA tournament games. (Or at least resemble the venues that host games.) To understand the importance of investing in playing such off-campus games, consider what University of Kentucky coach John
Calipari said about scheduling: “We’re trying to prepare for the NCAA tournament and that tournament is played in domes. Most people just play the home games and you win those, and then go on the road and you lose. But for this program, it’s important to play in the big football stadiums because that’s where the NCAA plays the Elite Eight and the Final Four.”

By placing the highest seeded and biggest programs in games in their home state, the Committee is perpetuating an advantage that only the most popular teams can utilize fully.

Lastly, we want to understand the Committee’s knowledge of the trade-off it faced when it chose to reduce uncertainty in first-round games. We do not have much reliable data regarding the television ratings of first-round games, but we do have a long time series on attendance at first-round games, a measure important to the NCAA, as over 10% of its operating revenue is generated by paying customers watching its championships. This non-trivial level of revenue made it critical for the NCAA to know what would happen to demand to buy a ticket to its first-round games after it changed course once the pod system was implemented.

To place ourselves in the Committee’s shoes, we compared attendance in in-state and other games across both regimes. As is shown in table 6, attendance in games that featured a high seed in an in-state game was larger compared to games that did not feature such a team, prior to the pod system being implemented. Since the 2002 tournament, the difference in attendance between the two types of games is significant at the 1% level. Based upon these numbers, we believe the NCAA had a notion that it could

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increase attendance at its first-round games by utilizing the in-state assignment more judiciously.

<table>
<thead>
<tr>
<th>Game Type</th>
<th>Attendance (n = # Games)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Pod/No High Seed In-State</td>
<td>15296 (n = 402)</td>
</tr>
<tr>
<td>Pre-Pod/High Seed In-State Team</td>
<td>15926 (n = 31)</td>
</tr>
<tr>
<td>Pod/No High Seed In-State</td>
<td>16324 (n = 297)</td>
</tr>
<tr>
<td>Pod/High Seed In-State</td>
<td>18408 (n = 34)</td>
</tr>
</tbody>
</table>

The figures in tables 3-6 leave little doubt that during the pod era the Committee has traded-off parity in certain situations for increases in attendance to its first-round games. Based upon game results and attendance figures from the 1985-2001 tournaments, the Committee understood the trade-off it faced when it decided to use the valuable in-state assignment to favor highly seeded teams in the pod era. They increased the likelihood of popular teams staying in the tournament longer and, given the strategy it employed, did not have to suffer a reduction in attendance to first-round games.

In a larger sense, our findings are consistent with studies that discuss the need for cartels to be flexible in making decisions and studies that show attendance at sporting contests rises, up to a point, as uncertainty falls. So, the Committee’s strategy illustrates how a sports league might make slight adjustments to the rules governing play in its league in order to increase demand for its product, but their strategy ultimately has made it more difficult for less popular teams to gain a toe hold from which they can compete more successfully with traditional powers. And another story of the status quo perpetuating itself is told.
Conclusion

In 2002, the NCAA Men’s Division I basketball tournament organizers implemented the pod-system as a way to assign participating teams to their first-round games. The change came in response to technological changes that provided the NCAA with new opportunities to broadcast its tournament to larger audiences and to the flight of the most talented young basketball players away from college basketball. The committee that selects teams and organizes the tournament has used the freedom granted by the pod system to reduce the travel burdens of and provided more valuable in-state first-round assignments to highly seeded (and usually popular) teams relative to their lower seeded, less popular opponents. The committee’s actions have reduced uncertainty in first-round games while increasing attendance to these games, as higher seeded teams are winning games at a significantly higher clip than they were before the pod system was implemented.

The flexibility that the NCAA exhibited in implementing the pod system is consistent with studies of cartels that discussed the necessity of maintaining a flexible decision-making process. The trade-off the NCAA made in which it reduced the uncertainty of its tournament contests in exchange for increases in attendance is consistent with previous studies of attendance at sporting contests.
REFERENCES


NCAA.com


