THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF FINANCE

EAST COAST BIAS IN THE NCAA TOURNAMENT

MATTHEW SHANNON
Spring 2012

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Finance
with honors in Finance

Reviewed and approved* by the following:

James Miles
Professor of Finance, Joseph F. Bradley Fellow of Finance
Thesis Supervisor/Honors Adviser

J. Randall Woolridge
Professor of Finance, The Goldman Sachs and Co.
and Frank P. Smeal Endowed University Fellow
Honors Second Reader

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

The NCAA Division I men's basketball tournament is one of the most popular sporting events in the world with millions of fans packing stadiums and tuning in from home to watch the games. With such a large audience watching the games the four-week tournament has evolved into a moneymaking machine with millions of dollars at stake for both the NCAA and the respective schools that participate in the tournament. Participation in the tournament is not only a source of school pride, but also a substantial source of revenue for participating schools. Thus, selection to the NCAA tournament has a significant economic impact on these institutions. The tournament is comprised of 64 Division I men's basketball teams. Teams automatically make the tournament upon winning their conference tournament; teams are also selected by a committee to fill the remaining 34 seeds for the tournament. This same selection committee seeds these 64 teams, dividing them into four regions with each team assigned a ranking from 1 to 16. This analysis of the tournament looks to see if there is a geographic bias in tournament selection, in which a team earns a higher ranking then they should earn, based upon location. The analysis also looks at size and conference bias in the tournament seeding process.

TABLE OF CONTENTS

INTRODUCTION

The NCAA men's basketball tournament is one of the most popular sporting tournaments in the world, with millions of fans watching the games. In 2010, the NCAA tournament final between Duke and Butler, garnered 23.94 million viewers. Since 1985, when the tournament switched to a 64 team format, the average viewership is 25.74 million households (Gorman, 2011). With such large viewership the tournament has surely lived up to its nickname of "March Madness".

BACKGROUND OF THE NCAA TOURNAMENT

The NCAA men's basketball tournament is the culmination of the end of the Division I Men's college basketball season. From 1985 – 2000 the NCAA tournament has had 64 teams. In 2001, the tournament evolved to include 65 teams, with the 64^{th} team playing the 65^{th} team in the first round before all the other teams started play in the second round. The winner of this game would face the overall number 1 seed in the second round. Then, in 2011, the tournament evolved to include 68 teams, with four first round games instead of the one first round game.

The current NCAA postseason play begins with teams participating in their conference tournaments. The winner of each of these conference tournaments receives an automatic bid to the tournament. The only exception to this is the Ivy League, which has no postseason tournament; their automatic bid is awarded to the regular season champion. The remaining 37 seeds are chosen by a selection committee to round out the 68 seeds in the tournament. These teams are chosen from the 31 conferences and there is no restrictions on how many teams can be

chosen from each conference. After all the teams have been selected, these teams are seeded, then they are placed in one of the four tournament brackets.

The tournament, as a whole, is divided into four regions, with each region having at least 16 teams. Some regions have more than 16 teams, as in 2011; there were four play-in games added before the first round of the tournament. After the four play-in games (the first round) are completed, the tournament has its 64 teams and each region now consists of only 16 teams, seeded 1 through 16, with the team seeded number 1 being seeded as the best team and the number 16 seed being the worst. In the round of 64, each region number 1 ranked team plays the sixteenth ranked team, the number ranked team plays the fifteenth ranked team, and so on. If a team wins its first round game, it advances to the next round of the tournament. The tournament is a single-elimination style tournament with seven rounds: the first round, (play-in round) the round of 64, the round of 32, regional semi-finals, regional finals, national semi-finals, and the national championship game. The eventual champion progresses through each of these rounds without losing in order to be crowned champion.

These sixty-seven games take place over a twenty-one day period across over fourteen venues. These host venues not only witness some of the best college basketball games of the year, but they also partake in the moneymaking machine, the NCAA. The city of Tulsa, Oklahoma, which hosted the second and third round games of the tournament anticipated earnings of $13 million (Notte, 2011). Host cities are not the only entities expecting to profit from the tournament; individual universities are expecting to profit from the tournament as well.

FINANCIAL BENEFITS

School spirit and school coffers, increase when a university's team plays in the NCAA Tournament. As previously mentioned, host cities make a substantial profit when hosting tournament games and the universities themselves also make a substantial amount of money by participating in the NCAA tournament. The NCAA has an eleven-year, $6 billion deal with CBS to broadcast the NCAA tournament (Riddix, 2010). According to Riddix, this money makes up 90% of the NCAA's operating revenue, and unlike the college football bowl agreement, the NCAA does not have to share any of this money with other sponsors. This money is then distributed to each team has participated in the tournament over the past six years. According to the NCAA's Revenue Distribution, for every game that a team plays in from the beginning of the tournament to the final, a team earns one basketball unit. Each basketball unit is worth approximately $206,020. This money is then passed along to the conferences that the respective teams are in and then divided equally. In addition to the financial benefits that the NCAA provides for the schools through revenue sharing of broadcast monies, universities also benefit from the increased media attention as more alumni and boosters are willing to donate more money to their universities. The revenue boosts for universities is also seen through increased merchandise and apparel sales.

A prime example of this increased revenue was evident in 2006 when George Mason advanced to the Final Four. As a result of their Final Four appearance, George Mason saw a twenty percent increase in applications for their college and the number of tours of the university almost tripled (Rossi, 2011). The university also saw an increase of almost $4 million in gifts with a twenty-five percent increase in donations directed specifically to the athletic department.

Another example which further exemplifies the positive financial impact that the NCAA tournament can have on individual schools, is that of Davidson College and their successful run in the 2008 tournament. Davidson, a 10 seed, advanced to the Elite Eight, this was further than anyone expected. The boost to the school was noticeable immediately, as daily sales at the student book store increased from $1,700 to $35,000 (Kimmel, 2008). Transfer inquiries also increased 1,200 percent (Kimmel, 2008).

These two examples it is clearly indicate that the financial impact of participation in the NCAA tournament goes beyond the money that is given to teams through the revenue distribution. The positive impact of playing in the NCAA Tournament is seen directly through the increase in merchandise and apparel sales, increase in donor money, and indirectly through the increase in interest in applying to the university. For these reasons, it is extremely important to universities to get a bid into the NCAA tournament.

SELECTION PROCESS

During the selection process, the committee selects the 37 at-large teams that did not receive an automatic bid by winning their conference tournament. Then, it ranks and seeds all 68 teams. The committee is made up of ten members, who are either university directors or conference commissioners. To avoid potential conflicts and biases, a prejudice about a team that earns them a higher seed then they deserve based upon their performance would justify, these conference commissioners and athletic directors are required to leave the room when their respective schools are being discussed. Athletic directors are permitted to discuss other schools that are in their conference only when specifically asked about them. According to "NCAA offers a peek into

the selection room" the process for selecting the 37 at-large teams is as follows:

> Each member of the selection committee submits a ballot with two columns. The first column represents teams that a member feels should be an at large selection, with a maximum of 37. The second column lists all teams that a member feels should warrant consideration, with no maximum. If a team receives all but two votes in column 1 (no athletic director or conference commissioner is allowed to vote for a team they represent), that team is placed into the tournament field. From there, an "under consideration" board is constructed which consists of teams that received at least two votes in either column, but did not meet the first qualification for at large selection. Also included on the under consideration board are teams that won or shared their regular season conference championship, but did not win its conference's automatic bid. Teams may be added to the under consideration board at any time if they gain at least three votes. Each member then selects eight teams from the under consideration board. The eight teams that receive the most votes comprise the next at large ballot. Each member of the committee will then rank those eight teams, with the first team receiving one point, the second team two points, and so on. The four teams that receive the lowest point total are added to the field, and the next four are held for the next ballot. Committee members then submit a list of the best remaining eight teams, and the four with the highest vote totals are added to the four teams from the first at large ballot, and the ranking process (with point values) is repeated, and the four teams with the lowest point totals are added to the field. This is done until all at large berths are filled.

The above paragraph states how the at large selection works, but it does not describe what each committee member is supposed to look at when nominating there at large teams. According to "Inside 'the bunker' How the selection committee's work may unfold", to determine which teams an individual committee member nominates they look at overall record, overall RPI, non-conference record, non-conference RPI, conference record, conference RPI, road record, record in last 10 games, record against teams sorted by RPI, NABC regional advisory committee rankings, Record vs. other under-consideration teams, Results against common opponents with other under-consideration teams, good wins, good losses, bad wins, bad losses, Quality of

competition throughout the season, Injuries, scheduling quirks, travel problems and any other circumstances that could have affected results (Winn, 2005).

After all 68 teams have been chosen, the next step in the process is seeding the teams. The selection committee ranks all 68 teams. The top four seeds will naturally be the number one seeds in the respective regions. The selection committee then uses what is known as the "S-Curve" to divide the teams into their respective regions. The S-Curve is used to keep the regions balanced by attempting to evenly divide the seeds. The selection committee will try to align the best number 1 seed with the weakest number 2 seed and the strongest number 3 seed with the weakest number 4 seed in the same region. This will work to ensure that the regions are fairly balanced. The regions are never perfectly balanced, but the committee strives to balance them as well as they can.

Based upon how the selection process works, with at-large teams being selected by a committee and not by a formula, it is not always a clear-cut decision on who should receive a bid to the NCAA tournament. The NCAA considers potential for revenue, in terms of tournament attendance and television viewership, when extending at-large bids. The selection committee is also well aware of the large monetary amount at stake for the individual schools and conferences that are selected to compete in the tournament, and the potential impact that acceptance into the tournament could have on both the individual school and conference. For these reasons it is possible that the selection committee could be biased for multiple reasons such as wanting to have a large television audience and wanting to have their school or conference have a team or multiple teams in the tournament.

REVIEW OF TERMS

At-Large Teams

These are teams that are selected to compete in the NCAA tournament by the selection committee. These teams have not won their conference, but have performed well enough in the regular season and conference tournament to gain inclusion into the tournament. Thirty-seven of the sixty-eight teams are selected at-large.

Automatic Qualifiers

These are teams that have won their conference tournament and do not have to rely on the selection committee to gain acceptance in the tournament. Thirty-one of the sixty-eight teams are automatic qualifiers.

Bias

A prejudice about a team that earns them a higher seed then they deserve based upon their performance would justify.

Bracket

This is the structure of the tournament itself. The bracket is divided into four regions and displaying the matchups for all of the sixty-eight teams.

Bracketology

This is the analysis and process by which media pundits and individuals select and predict the outcomes of every game in the NCAA tournament.

Central

In this paper the term refers to teams of schools whose campuses are in the Central Time Zone.

Conference Bias

The bias associated with a team being selected into the tournament because of their conference affiliation. This bias is generally associated with the major conferences.

East Coast

In this paper the term refers to teams of schools whose campuses are in the Eastern Time Zone.

East Coast Bias

The bias that is associated with a team being from the eastern part of the country. General reasons for this bias are the large population in the east, a large collection of media in the east, as well as a greater percentage of universities in the eastern part of the country.

Elite Eight

This is a reference to the round of the tournament that is composed of eight teams and is the regional finals and quarterfinals of the entire tournament.

Final Four

This is a reference to the round of the tournament that is composed of four teams and is the national semi-finals.

Good Conference

This is in reference to teams that have a strong conference, composed of multiple teams that are nationally-ranked and have had successful seasons. Generally this is a reference to major conferences and select mid-major conferences.

Major School

A major school is a school that is a member of the following six conferences: Atlantic Coast Conference (ACC), Big 10, Big 12, Big East, PAC 12, and the Southeastern Conference (SEC). These are the largest and most successful conferences in the NCAA tournament.

Media Bias

The bias that is associated with the fact that the majority of the sports media is based in the east coast, such as ESPN, which provides in-depth tournament coverage, as well as CBS which has the television contract for the NCAA tournament.

Mediocre Conference

This is a reference to teams that have a weak conference, composed of teams that are not nationally-ranked and have had poor seasons. Generally this is a reference to small conferences and select mid-major conferences.

Mid-Major School

A mid-major school is a school that is a member of the following nine conferences: Atlantic 10 (A10), Colonial Athletic Association (CAA), Conference USA, Horizon, Mid-America, Missouri Valley, Mountain West, Western Athletic Conference, and West Coast.

Mountain

In this paper the term refers to teams of schools whose campuses are in the Mountain Time Zone.

Perform Poorly

This term describes a team that does not perform as well as their seed would indicate. For example, teams that are seeded first should make it to the semifinals, because they are supposed to be one of the four best teams in the nation. If a team seeded first does not make it to the Final Four it has performed poorly.

Perform Well

This term describes a team that performs as well as its seed would indicate. For example, teams that are seeded eighth should win their first round game only. If this team wins a second round game it has performed well.

Previous Selection Bias

The bias that is associated with teams receiving preferential treatment because they have been in the tournament in previous years. An example of a team demonstrating previous selection bias is Duke University, which receives preferential treatment because they usually make the tournament and generally experience success in the tournament.

Rating Percentage Index (RPI)

The index is used to rank teams in college basketball based on a wins, losses, and strength of schedule. This formula was created by the NCAA. The current formula to calculate RPI is: (WP * 0.25) + (OWP * 0.50) + (OOWP * 0.25).

Regions

These are the four subdivisions of the bracket. Each region has sixteen teams seeded one to sixteen.

School Size Bias

The bias that is associated with the size of the institution itself. This bias is based upon a schools size reflecting the alumni I base and therefore a good measure of fan base.

Selection Committee

This is the organization that is made up of 10 members, who are either Athletic Directors at schools or Conference Commissioners. The committee is responsible for selecting the thirty-seven at large teams and is also responsible for seeding the teams in the tournament and arranging the bracket.

S-Curve

This is used to keep the regions balanced by attempting to evenly divide the seeds. The term is derived from the snake like shaped that is used. The sixty-eight teams are listed in order and the first four teams each go to their own region and then the next four teams are two seeds and they then are assigned to a region with the best two seed going to the region of the worst one seed.

Small School

A small school is a school that is a member of the following sixteen conferences: America East, Atlantic Sun, Big Sky, Big South, Big West, Ivy League, Metro Atlantic Athletic Conference (MACC), Mid-Eastern Athletic Conference (MEAC), Northeast, Ohio Valley, Patriot League, Southern, Southland, Summit, Sun Belt, and Southwestern Athletic Conference (SWAC).

Sweet Sixteen

This is a reference to the round of the tournament that is composed of sixteen teams and is the regional semi-final.

Tournament Seed

This is the ranking that a team gets in the NCAA tournament before any games have been played in the tournament. This seed is based upon information from the regular season and conference tournament.

West Coast

In this paper the term refers to teams of schools whose campuses are in the Western Time Zone.

THESIS ORIGIN

As a fan of college basketball, I have always been interested in the NCAA tournament and what has become known as "Bracketology". I always participated in March Madness Pools, a challenge where individuals try to compete against others to try to predict the outcome of every game of the tournament. I was always interested in garnering an edge in predicting what teams would stand a better chance in advancing in the tournament. This passion of mine is shared by millions of other people in America and the media has taken advantage of this passion. The media has made the selection process and analysis of the upcoming first round of the tournament an event in itself. ESPN, the main proponent of these festivities, aired seventy-one consecutive hours of coverage leading up to first round games in 2011 (Seidman, 2011). With all of this drama surrounding the tournament, I thought that it would be interesting to look into this passion of mine, and see if it could provide a possible thesis topic. As I began to look into the analyses of the NCAA tournament and its seeding process, I found a handful of papers about the subject itself.

Other papers have previously investigated biases in the at-large selection process, as well as in the seeding process. The first paper that I looked at, *Punching a Ticket to the Big Dance: A Critical Analysis of At-Large Selection Into the NCAA Division I Men's Basketball Tournament*, investigated the at-large selection process and how a bias was found that revealed that bigger conferences received more at-large bids then smaller conferences. This paper also mentioned a possible bias based on teams being located in the east coast, as well as teams who had been in the tournament the prior year. This paper provided the fundamental question which I wanted to research - is there an east coast bias. The idea was briefly mentioned in the paper, but I thought

it was the most interesting to look into, especially as the idea of east coast bias has been mentioned repeatedly by ESPN in other areas of sports such as MLB All-Star voting and the Heisman Trophy selection (Merron, 2012). I also did not want to simply investigate the at-large selection process, but a more interesting aspect of the tournament, the seeding process.

The basis for looking into seeding gained justification from the paper, *Major Conference Bias and the NCAA Men's Basketball Tournament*, which investigated conference bias and if teams in certain conferences were given a higher seed. Tournament results were looked at from previous years to see if there was evidence of bias based upon the team's performance. After further investigation, I found that another academic paper, *Evidence of Bias in NCAA Tournament Selection and Seeding*, looked into the same aspect of seeding bias based upon conferences. Another paper, *A Cheap Ticket to the Dance: Systematic Bias in College Basketball's Ratings Percentage Index*, delved a little deeper into the biases associated with conferences, with the use of RPI and several different models; the paper was useful in developing ideas, but I decided not to investigate biases using RPI. I decided not to use RPI as the data was too difficult to obtain for the time frame I was investigating.

The basis for looking into school size as a bias came from the paper, *The NCAA Basketball Tournament Selects Fan Favorites over Parity*. This paper looks at seeding biases based upon teams that have had previous success in the tournament in recent years. These teams would appeal to potential consumers and the tournament would want these teams to progress further as they would have more viewers watching because they like the team, the paper argues. From reading this I thought that there could potentially be a biased associated with fan bases and the easiest way to analyze and quantify this was to look at the school size.

From these papers, I devised certain methodologies and chose to investigate east coast

bias in seedings. I also chose to investigate conference bias as it had been investigated by the previous papers. I also chose to investigate school size as the population is a factor in east coast bias (Mitchell, 2011).

Because these papers played a critical role in the development of my thesis, I have included a literature review of each below.

LITERATURE REVIEW

Punching a Ticket to the Big Dance: A Critical Analysis of At-Large Selection Into the NCAA Division I Men's Basketball Tournament

This paper states that due to the varying degrees of competitiveness in conferences, the fact that many of the at-large bids consistently go to larger conferences is a controversial topic. These major conferences are the ACC, Big 12, Big East, Big Ten, PAC 10, and SEC. This conference affiliation, though is overlooked by the committee as it focuses on the overall resume of the school and not the conference affiliation. In addition to the conference bias, there is a potential bias to teams on the east coast as both highly influential media providers such as CBS and ESPN are based in the east. Another potential bias is shown towards teams that have been to the tournament in previous years.

The research showed that team success usually favored teams that gained admittance into the tournament through the at-large selection process. "Selected teams had a .723 winning percentage compared to .606 for non-selected teams. Selected teams also had more quality wins (5.12) and less significant losses (1.08) compared to non-selected teams (2.16 and 2.36, respectively). However, strength of schedule differed only slightly (.562 for selected teams compared to .538 for non-selected teams). In addition, selected teams had more historical success in terms of tournament selection (5.17 tournament appearances in the last 10 years for selected teams compared to 2.95 for non-selected teams)" (Shapiro, 2009). The research showed that team selection for admittance into the tournament generally met the guidelines used by the selection committee, with conference membership having an influence on tournament selection. This potential conference bias is an issue as large financial benefits and national exposure for the

colleges are at stake with tournament selection.

Major Conference Bias and the NCAA Men's Basketball Tournament

The paper examined the NCAA selection committee's bias associated with the six power conferences, ACC, Big 12, Big East, Big Ten, PAC 10, and SEC. The paper found evidence for bias in the tournament seeding of teams from the six power conferences when compared against the mid-major and minor conferences. Two significant results were found from the research.

The study found that the selection committee does a fair job of evaluating team's abilities and seeds teams correctly for the NCAA tournament. The positive seed-differential variable shows that a higher-seeded team should beat a lower-seeded team, thus showing that teams are seeded properly. When teams are one seed apart, there is an expected score differential of approximately 1.30 points. For teams that are more than one seed apart, 1.30 is multiplied by the seed differential to derive expected score differential.

The paper also stated that despite the selection committee doing a fair job, the selection process is not completely free of bias. The research indicated that teams in the SEC may be over-ranked and ACC teams may be under-ranked based upon data from previous tournaments. The research indicates that the selection committee is biased in seeding ACC teams approximately 2 seeds higher and SEC teams approximately 2 seeds lower than play indicates that they should be seeded.

Evidence of Bias in NCAA Tournament Selection and Seeding

This analysis of the NCAA tournament selection committee's selection and seeding decisions shows bias in the 10 years in which these decisions were examined. The selection

committee seemed to favor all major conferences, as well as mid-major conferences, with possible the exception of the Mountain West Conference, in the selection and seeding process more than what would be indicated by the performance based factors which are highly correlated with the Committee's decision process. The researchers also found evidence that conference affiliation is taken into account when looking into who makes the tournament as the committee is aware of how many teams from each conference are in the tournament. The paper also found that there is bias in favor of teams that are somehow represented on the selection committee, such as having its athletic director or conference commissioner on the selection committee or having a fellow conference member's athletic director on the committee.

A Cheap Ticket to the Dance: Systematic Bias in College Basketball's Ratings Percentage Index

The research shows that the RPI is systematically biased. The research shows that RPI penalizes teams according to the ability level of their conference, such that a mediocre team in a good conference and a good team in a bad conference are made relatively closer to one another. This effect may cause a good team in a bad conference to achieve a higher RPI ranking than a mediocre team in a good conference, even when the mediocre team in the good conference is more talented. The paper concludes that the presence of this long-lasting bias may be a result of an underlying NCAA agenda. The paper shows that the NCAA must choose less talented teams to maximize fan interests, rather than basing team selection upon talent alone.

The NCAA Basketball Tournament Selects Fan Favorites over Parity

The paper states that television viewership for the NCAA tournament has declined over

the last fifteen years. This fact is of great concern for the NCAA because the NCAA depends a great deal on the revenue from selling the broadcast rights. The paper claims that because of this concern for revenue, the NCAA has given teams with more recognizable names more favorable opening round games. The paper states, that since 2002, the top seeds have received more geographically favorable first round locations. This makes sense, as greater numbers of fans are more interested in the tournament as the higher seeds progress deeper into the tournament.

METHODOLOGY

Collecting the data was a three-step process that involved: 1) obtaining the data of team's tournament performances and results from 1985 to 2010; 2) assigning values to the performance results of each team; 3) dividing up the teams in groups to accurately analyze the data. I created this methodology myself as I thought that this way would be the easiest to analyze the biases across the given time frame.

Obtaining the Data

In order to collect the required data, I utilized the database of CBS Sports that contains historical data of the NCAA tournament going back to 1939. I chose to utilize the data from 1985 to 2010, as this was when the tournament was expanded to 64 seeds and its current bracket structure. This database contained the seeds of all the teams in the tournament, as well as the results of every tournament game. This decision was crucial in obtaining the data as most databases contain only the Final Four and not the whole seeding structure of the tournament, as well as not being as reputable as CBS.

Assigning Values

With all of this data, it was necessary to assign values to seeds, as well as to values to the team's final result in the tournament. To do this I assigned a value to each seed based upon the following table:

Seed	Value
1	4
2	3
3	2
4	2
5	1
6	1
7	1
8	1
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0

As seen in this table the top eight seeds have positive values as they are theoretically the only seeds that are expected to advance to the next round because they all play teams that are ranked lower then themselves in the first round of the tournament. This methodology is continued throughout the rounds. Seeds one through four are expected to win their second round games as they will be the higher seeds in the second round games. This continues to the one seeds having the highest expected value as they are expected to win up until the Final Four. I did not choose to have any higher possible values then four because if all the games played out according to seeds then all number one seeds would be playing each other and it would be near impossible to justify who was supposed to win between equal seeds.

In addition to assigning values to the original seeds, I also needed to assign values to the outcome of the games in the tournament. To do this I assigned a value to each team based upon their actual performance in the tournament based on the following table:

Round	Value
Round of 64	0
Round of 32	1
Sweet Sixteen	2
Regional Runner-up	3
National Semifinals	4
Runner Up	4
Champion	4

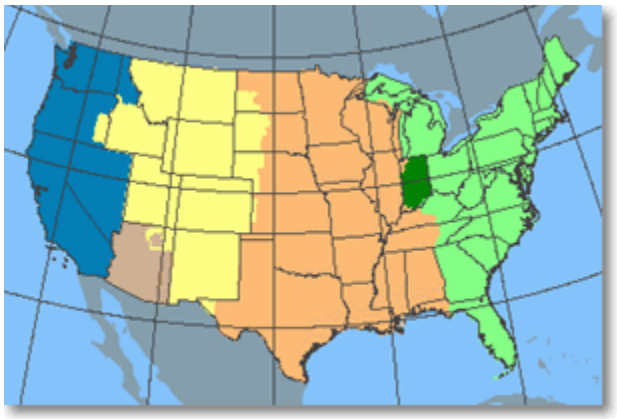
As seen in the table, values are assigned based upon which round a team loses in during the tournament. The table shows that values increase as a team advances further along in the tournament. As the table indicates, exiting in the first round of the tournament is worth zero points. As a team advances in the tournament, it will be awarded with one more point value. This system continues until a point value of four. As explained in the previous paragraph it would be hard to justify a number one seed playing another number one seed and who should win. For this reason after a team reaches the national semi-finals the team will max out at a value of 4 for the actual value that they are assigned. This also makes the maximum value for expected value of a seed equal to the maximum value of the actual performance of a team.

For this reason, the main value that will be used will be the Actual Value of Team Performance (value based upon which round the team loses in) - Expected Value of Team Performance (value based upon the teams seed). This calculated value helps to show the difference between what is predicted to happen and what actually happens, helping to illuminate any teams that have received a higher or lower seed than they should have. Negative values occur when a team finishes worse than they are supposed to perform. A value of zero occurs when a team performs how they are expected to perform, and a positive value occurs when a team performs better than they are expected to perform.

Assigning Groups

In an effort to analyze the biases associated and viewed in college basketball seeding, I have decided to look into multiple areas: east coast bias (bias associated with geographical location of school), east coast bias based upon conference location, conference bias, and school size bias. To investigate these biases I divided the schools in groups for each of the respective biases.

To divide the teams up by based upon geographical location to investigate east coast bias, I divided the teams based upon the time zones in which the school is located. For this I used College Board to find the location of the colleges and then used the following map with the time zones to see what zone each school was in the values of east, central, mountain, and west to the school.



To divide the teams up by based upon geographical location to investigate east coast bias based upon conference location, I divided the teams up the same way as used to investigate east coast bias, but also used the following chart to define where the conferences respective headquarters are located. The table is below:

Conference	Headquarter Location	Time Zone
ACC	Greensboro, North Carolina	Eastern
America East	Boston, Massachusetts	Eastern
Atlantic 10	Newport News, Virginia	Eastern
Atlantic Sun	Macon, Georgia	Eastern
Big 10	Park Ridge, Illinois	Central
Big 12	Irving, Texas	Central
Big East	Providence, Rhode Island	Eastern
Big Sky	Ogden, Utah	Mountain
Big South	Charlotte, North Carolina	Eastern
Big West	Irvine, California	Western
CAA	Richmond, Virginia	Eastern
Conference USA	Irving, Texas	Central
Horizon	Indianapolis, Indiana	Eastern
Ivy League	Princeton, New Jersey	Eastern
MACC	Edison, New Jersey	Eastern
MEAC	Virginia Beach, Virginia	Eastern
Mid-America	Cleveland, Ohio	Eastern
Missouri Valley	St. Louis, Missouri	Central
Mountain West	Colorado Springs, Colorado	Mountain
Northeast	Somerset, New Jersey	Eastern
Ohio Valley	Brentwood, Tennessee	Central
Pac-12	Walnut Creek, California	Western
Patriot League	Center Valley, Pennsylvania	Eastern
SEC	Birmingham, Alabama	Central
Southern	Spartanburg, South Carolina	Eastern
Southland	Frisco, Texas	Central
Summit	Elmhurst, Illinois	Central
Sun Belt	New Orleans, Louisiana	Central
SWAC	Birmingham, Alabama	Central
WAC	Greenwood Village, Colorado	Mountain
West Coast	San Bruno, California	Western

To divide the teams by based upon conference bias, I assigned schools to either major, mid-major, or small conference groups. I used the same division of conferences that was used in the paper: Major Conference Bias in the NCAA Men's Basketball Tournament. I identified which team was in each conference, then assigned the teams and respective conferences to the overall conference size classification. The table used is as follows:

Major	Mid-Major	Small
ACC	Atlantic 10	America East
Big 10	CAA	Atlantic Sun
Big 12	Conference USA	Big Sky
Big East	Horizon	Big South
Pac-12	Mid-America	Big West
SEC	Missouri Valley	Ivy League
	Mountain West	MACC
	WAC	MEAC
	West Coast	Northeast
		Ohio Valley
		Patriot League
		Southern
		Southland
		Summit
		Sun Belt
		SWAC

To divide the teams by based upon size of school, I obtained the size of schools from the College Board. I then looked at the size of the schools of every school that made an appearance in the tournament and divided the schools into quartiles. Below are the assignments of quartiles based upon school size:

Quartile	Students
Smallest	1506.00
1st	6664.50
2nd	14670.00
3rd	22659.25
Largest	59850.00

DATA RESULTS

The data results for the east coast bias in the NCAA tournament seem to be disproved by the results of the analysis. The results data actually shows that west coast teams, on average, underperform more than any other group of teams. They have the worst performance in 10 of the 27 years or a little over 37% of the time. When looking at all the time zones, schools in the Central Time Zone did the best as it was the only time zone to on average to do better than expected. When looking at the geographical breakdown of the country halves, combining the Central and Eastern Time Zones to represent the East and combining the Mountain and Western Time Zones to represent the West, the results are still the same, with the west substantially underperforming in the tournament compared to the east. The west in this example underperformed more than the east in 18 out of the 27 years, or two-thirds of the time.

East Coast Bias	Years	% of Total
Eastern	4	14.81%
Western	10	37.04%
Mountain	8	29.63%
Central	5	18.52%
Central + East	9	33.33%
Mountain + West	18	66.67%

The same results were gained when looking at the East Coast bias associated with conference headquarter location. When looking at the results of the data it actually shows that west coast teams, on average, underperform more than any other group of teams with the worst performance in 13 of the 27 years or a little over 48% of the time. When looking at all the time zones the Mountain Time Zone performed the best, as it was the only time zone to, on average, do better than expected. When looking at the geographical breakdown of the country halves,

combining the Central and Eastern Time Zones to represent the East and combining the Mountain and Western Time Zones to represent the West, the results are still the same with the west substantially underperforming in the tournament compared to the east. The west, in this example, underperformed more than the east in 19 out of the 27 years or a little over than 70% of the time.

East Coast Bias (Conference Headquarters)	Years	% of Total
Eastern	2	7.41%
Central	6	22.22%
Mountain	6	22.22%
Western	13	48.15%
Central + East	8	29.63%
Mountain + West	19	70.37%

The most compelling bias analyzed was conference bias. The research showed that there are extremely strong biases to teams that are in the six major conferences. The data showed that these teams, on average, underperformed by the greatest extent, compared to small and mid-major schools, underperforming the most in 26 out of the 27 years of the NCAA tournament. Both mid-major and small schools performed better than expected, on average, across the study. Small schools performed better every year during the tournament, while mid-major schools outperformed in all but two years, 1994 and 2006. Major schools, on the other hand, underperformed every year except one, 1994.

Conference Bias	Years	% of Total
Major	26	96.30%
Mid-Major	1	3.70%
Small	0	0.00%

The next set of data analyzed looked into bias associated with size of school. These results showed that the larger the school was the more likely the team is to perform poorly in the tournament. When looking at the results of the data, the largest schools teams, on average, underperform more than any other group of teams, with the worst performance in 14 of the 27 years or a little over 51% of the time. When looking at all the time zones, the smallest schools performed the best, as these schools on average did better than expected over the 27 year period. The second smallest group of schools also did better than expected over the time period. When looking at the breakdown of school size into halves instead of quartiles the results show that the large schools did the worse in 22 out of the 27years, or a little over 81% of the time.

School Size Bias	Years	% of Total
1st	2	7.41%
2nd	3	11.11%
3rd	8	29.63%
4th	14	51.85%
Small	5	18.52%
Large	22	81.48%

CONCLUSION

Using a point value system analysis, biases were identified in the selection and seeding process in the NCAA men's Division I basketball tournament. Using this analysis, no bias was found with respect to geographical location and conference geographical location in the seeding process in the NCAA men's Division I basketball tournament; however, conference and school size biases were found.

The results of this thesis show that there is not an east coast bias when it comes to seeding teams in the NCAA tournament. It is clear that throughout the 27 year period of the tournament I analyzed a biased towards teams who reside in the eastern time zone is non-existent. It seems that on the other hand, teams that reside in the western time receive higher seeds then they deserve as their performance has not lived up to what was expected of them. It also appears that the East Coast bias associated with conference headquarter location is also nonexistent. This is not surprising given the fact that most schools generally are close in proximity to the conference headquarters.

The assumption that there was a bias associated with school size has held true. The results are pretty clear as there is a relationship between increasing size of school and underperformance, as size of school increased underperformance increased. This seems to support the idea that the selection committee tries to appeal to fan bases by giving these teams a higher seed then they deserve in an effort to have them advance further in the tournament by providing them with an easier road to the later rounds.

The analysis of Conference Bias in the seeding of the NCAA tournament has confirmed what previous research had found, that the major teams are seeded higher than is justified by

their performance. Conference bias was the most evident of the four biases that were analyzed as it had the most compelling evidence supporting the hypothesis.

The NCAA men's Division I basketball tournament is not only a major sporting event that is eagerly anticipated by fans each year, but is also a major revenue source for the NCAA, host cities, and participating universities and their respective conferences. With so much attention directed to this tournament it is not surprising that selection to the tournament and subsequent seeding is important to all parties involved. The point value system provides significant data that demonstrates that bias exists in regards to major conferences and large schools, but not in regards to the east coast and conference geographical location.

BIBLIOGRAPHY

Coleman, Jay, J. Michael DuMond, and Allen K. Lynch. "Evidence of Bias in NCAA Tournament Selection and Seeding." *MANAGERIAL AND DECISION ECONOMICS* 31 (2010): 431-52. Web. 18 Mar. 2012. <http://onlinelibrary.wiley.com/doi/10.1002/mde.1499/pdf>.

Gorman, Bill. "Butler: Boon or Bane For NCAA Finals Ratings? (Historical Ratings Poll)." *NCAA Men's Basketball Tournament Nielsen TV Ratings, 1975-2009*.TVbytheNumbers, 4 Apr. 2011. Web. 18 Mar. 2012. <http://tvbythenumbers.zap2it.com/2011/04/04/butler-boon-or-bane-for-ncaa-finals-ratings-historical-ratings-poll/88034/>.

Kimmel, Meg. *Good Times, Great Times Sweet Elite Eight*. Rep. Davidson College. Summer 2008. Web. 18 Mar. 2012. <http://www3.davidson.edu/cms/Documents/OfficesServices/CollegeRelations/CollegeCommunications/Summer08DJ_bball.pdf>.

Riddix, Mark. "The March Madness Effect." *Investopedia*. 2 Mar. 2010. Web. 18 Mar. 2012. <http://www.investopedia.com/financial-edge/0310/The-March-Madness-Effect.aspx>.

McFall, Todd and Bronars, Stephen G., The NCAA Basketball Tournament Selects Fan Favorites Over Parity (October 15, 2010). Available at SSRN: http://ssrn.com/abstract=1692855 or http://dx.doi.org/10.2139/ssrn.1692855

Merron, Jeff. "Exhibits: East Coast Bias Doesn't Exist." *Page 2*. ESPN. Web. 18 Mar. 2012. <http://espn.go.com/page2/s/list/eastcoastno.html>.

Mitchell, Sean. "There Is No East Coast Bias in Pro and College Sports." *Yahoo! Sports*. 7 Jan. 2011. Web. 18 Mar. 2012. <http://sports.yahoo.com/nba/news?slug=ycn-7482318>.

"NCAA Offers a Peek into the Selection Room." *NCAA Offers a Peek into the Selection Room*. Web. 18 Mar. 2012. <http://www.thevictoryformation.com/2012/02/16/ncaa-offers-a-peek-into-the-selection-room/>.

Notte, Jason. "NCAA TOURNAMENT SITES FOR 2011, 2012, 2013 & TICKETS." *New Big East Basketball Report*.MainSt, 10 Mar. 2011. Web. 18 Mar. 2012. <http://www.nbebasketball.com/w3/2009-0921/ncaa-tournament-sites-released-for-2011-2012-2013/>.

Rossi, Kevin. "The Sports Complex." *Impact of Making the NCAA Tournament*.16 Mar. 2011. Web. 18 Mar. 2012. <http://drexelsmtsu.blogspot.com/2011/03/impact-of-making-ncaa-tournament.html>.

Sanders, Shane. "A Cheap Ticket to the Dance: Systematic Bias in College Basketball's Raitings Percentage Index." *Economics Bulletin* 4.34 (2007): 1-7. Web. 18 Mar. 2012. <http://www.accessecon.com/pubs/EB/2007/Volume4/EB-07D80023A.pdf>.

Seidman, Robert. "ESPN Selection Sunday TV Schedule Includes 71 Hours of Coverage 'Bracket Bound' App." *ESPN Selection Sunday TV Schedule Includes 71 Hours of Coverage*. TVbytheNumbers, 10 Mar. 2011. Web. 18 Mar. 2012. <http://tvbythenumbers.zap2it.com/2011/03/10/espn-selection-sunday-tv-schedule-includes-71-hours-of-coverage-bracket-bound-app/85286/>.

Shapiro, Stephen L., JorisDrayer, Brendan Dwyer, and Alan L. Morse. "Punching a Ticket to the Big Dance: A Critical Analysis of At-Large Selection Into the NCAA Division I Men's Basketball Tournament." *Journal of Issues in Intercollegiate Athletics* (2009): 46-63. *Http://www.csri-jiia.org/documents/puclications/research_articles/2009/JIIA_2009_4_Shapiro_Publish_Copy.pdf*. Web. 18 Mar. 2012. <http://www.csri-

jiia.org/documents/puclications/research_articles/2009/JIIA_2009_4_Shapiro_Publish_Copy.pdf>.

"Time Zones of the United States." Map. *Nationalatlas.gov*. Web. 25 Mar. 2012.<http://nationalatlas.gov/mld/timeznp.html>.

Winn, Luke. "SI.com - Writers - Luke Winn: Inside 'the Bunker' - Wednesday March 9, 2005 4:51PM." *Breaking News, Real-time Scores and Daily Analysis from Sports Illustrated – SI.com*. Sports Illustrated, 9 Mar. 2005. Web. 18 Mar. 2012. <http://sportsillustrated.cnn.com/2005/writers/luke_winn/03/09/inside.bkc/>.

Zimmer, Timothy, and Todd Kuethe. "Major Conference Bias and the NCAA Men's Basketball Tournament." *Economics Bulletin* 12.17 (2008): 1-6. Web. 18 Mar. 2012. <http://www.accessecon.com/pubs/EB/2008/Volume12/EB-07L80004A.pdf>.

APPENDIX

East Coast Bias Avg Performance						
East	Central	Mountain	Western		Worst	
0.058823529	0.045454545	0	-0.428571429		-0.428571429	Western
-0.216216216	0.380952381	0	0		-0.216216216	East
-0.125	0.125	0.5	-0.25		-0.25	Western
-0.03030303	0.136363636	-0.4	0		-0.4	Mountain
0.0625	0.041666667	-0.333333333	-0.4		-0.4	Western
-0.0625	0	-0.5	0.571428571		-0.5	Mountain
0.147058824	-0.105263158	0	-0.5		-0.5	Western
0.117647059	-0.045454545	-0.666666667	-0.2		-0.666666667	Mountain
0.03125	0	-0.75	0.333333333		-0.75	Mountain
0.060606061	0	0.5	-0.5		-0.5	Western
-0.09375	0.19047619	-0.2	0		-0.2	Central
-0.058823529	0.105263158	0	0		-0.058823529	East
-0.105263158	0	0.75	0.142857143		-0.105263158	East
-0.052631579	-0.333333333	0.25	0.857142857		-0.333333333	Central
0.058823529	0.05	-1	0		-1	Mountain
-0.03125	0.2	-0.75	0		-0.75	Mountain
0.114285714	-0.529411765	0.5	0.428571429		-0.529411765	Central
-0.066666667	0.105263158	0.25	-0.2		-0.2	Central
-0.172413793	0.090909091	0.125	-0.2		-0.2	Western
0.057142857	0.277777778	0	-0.428571429		-0.428571429	Western
0	-0.045454545	0.5	-0.428571429		-0.428571429	Western
0.034482759	-0.083333333	0.25	0		-0.083333333	Central
0.117647059	-0.176470588	-0.666666667	0.3		-0.666666667	Mountain
-0.064516129	0.15	-0.333333333	-0.1		-0.333333333	Mountain
-0.03125	-0.05	0	-0.142857143		-0.142857143	Western
0	0.055555556	0	0		0	East
0.023809524	0.083333333	0.5	-0.166666667		-0.166666667	Western
Average						
-0.008389155	0.024788675	-0.05462963	-0.048589065			

Conference Bias Avg Performance					
Major	Mid-Major	Small		Worst	
-0.029411765	0	0.111111111		-0.029411765	Major
-0.117647059	0.111111111	0.166666667		-0.117647059	Major
-0.060606061	0.055555556	0.076923077		-0.060606061	Major
-0.088235294	0.105263158	0.090909091		-0.088235294	Major
-0.131578947	0.133333333	0.272727273		-0.131578947	Major
-0.176470588	0.25	0.1		-0.176470588	Major
-0.189189189	0.470588235	-0.1		-0.189189189	Major
-0.2	0.294117647	0.166666667		-0.2	Major
-0.1875	0.263157895	0.076923077		-0.1875	Major
0	-0.055555556	0.083333333		-0.055555556	Mid-Major
-0.181818182	0.235294118	0.142857143		-0.181818182	Major
-0.028571429	0	0.083333333		-0.028571429	Major
-0.114285714	0	0.266666667		-0.114285714	Major
-0.133333333	0.19047619	0		-0.133333333	Major
-0.393939394	0.722222222	0		-0.393939394	Major
-0.088235294	0.176470588	0		-0.088235294	Major
-0.388888889	0.8125	0.083333333		-0.388888889	Major
-0.25	0.571428571	0		-0.25	Major
-0.029411765	-0.125	0		-0.125	Major
-0.0625	0.210526316	0.153846154		-0.0625	Major
-0.147058824	0.0625	0.142857143		-0.147058824	Major
-0.3125	0.411764706	0.2		-0.3125	Major
-0.057142857	0.2	0.071428571		-0.057142857	Major
-0.176470588	-0.066666667	0.4		-0.176470588	Major
-0.135135135	0	0.142857143		-0.135135135	Major
-0.25	0.352941176	0.2		-0.25	Major
-0.142857143	0.4375	0.076923077		-0.142857143	Major
Average					
-0.15084398	0.215538096	0.111457884			

School Size Avg Performance						
1st	2nd	3rd	4th		Worst	
-0.111111111	0.545454545	0.157894737	-0.32		-0.32	4th
0.071428571	0.111111111	-0.222222222	0.086956522		-0.222222222	3rd
0.444444444	0.166666667	0.058823529	-0.269230769		-0.269230769	4th
0.4	0.333333333	0.05	-0.409090909		-0.409090909	4th
0.214285714	0.111111111	-0.055555556	-0.130434783		-0.130434783	4th
0.555555556	0	0.055555556	-0.260869565		-0.260869565	4th
0.363636364	0	-0.176470588	-0.041666667		-0.176470588	3rd
-0.1	0.444444444	-0.136363636	0		-0.136363636	3rd
0	0	0.052631579	-0.041666667		-0.041666667	4th
0.3	0.25	-0.058823529	-0.2		-0.2	4th
0	0.125	0.3	-0.28		-0.28	4th
-0.076923077	-0.1	0.470588235	-0.25		-0.25	4th
0.0625	0.090909091	0.071428571	-0.130434783		-0.130434783	4th
0.153846154	0.2	0	-0.19047619		-0.19047619	4th
0.461538462	-0.25	0.047619048	-0.227272727		-0.25	2nd
0.333333333	0	-0.333333333	0.047619048		-0.333333333	3rd
0.285714286	0.272727273	-0.076923077	-0.230769231		-0.230769231	4th
-0.076923077	0	0.055555556	-0.043478261		-0.076923077	4th
-0.153846154	0.125	0	-0.076923077		-0.153846154	3rd
0.066666667	0.272727273	0	0		0	3rd
-0.363636364	0.2	-0.368421053	0.291666667		-0.368421053	1st
0.071428571	0.083333333	-0.166666667	0		-0.166666667	3rd
0.181818182	0	0.111111111	-0.08		-0.08	4th
0.071428571	-0.2	0.052631579	-0.047619048		-0.2	2nd
-0.285714286	0.1875	-0.076923077	-0.107142857		-0.285714286	1st
0.5	-0.333333333	-0.058823529	0		-0.333333333	2nd
0.230769231	-0.111111111	-0.25	0.133333333		-0.25	3rd
Average						
0.133342224	0.093513842	-0.018395806	-0.102870369			

Conference Headquarter Avg Performance						
East	Central	Mountain	West		Worst	
0.172413793	-0.115384615	0	-0.4		-0.4	West
-0.03030303	0.04	0	0		-0.03030303	East
-0.16	0.137931034	0.2	-0.2		-0.2	West
0.071428571	0	-0.5	0		-0.5	Mountain
0.148148148	-0.037037037	0.75	-1		-1	West
0.192307692	-0.259259259	-0.25	0.428571429		-0.259259259	Central
0.266666667	-0.227272727	-0.2	-0.285714286		-0.285714286	West
0.068965517	0.037037037	1	-0.833333333		-0.833333333	West
0.074074074	-0.037037037	-0.333333333	0		-0.333333333	Mountain
0.033333333	0.04	0	-0.4		-0.4	West
0.074074074	-0.038461538	1	-0.2		-0.2	West
0.032258065	-0.043478261	0	0		-0.043478261	Central
0.09375	-0.333333333	-0.5	0.555555556		-0.5	Mountain
0.117647059	-0.421052632	-0.4	1		-0.421052632	Central
-0.142857143	0.259259259	0.666666667	-0.833333333		-0.833333333	West
-0.142857143	0.28	0	-0.428571429		-0.428571429	West
0.296296296	-0.5	0.666666667	0.375		-0.5	Central
-0.12	0.12	0.25	-0.2		-0.2	Central
0	-0.12	0	0		-0.12	West
0.096774194	0.173913043	0.666666667	-0.714285714		-0.714285714	West
0	-0.038461538	0.25	-0.285714286		-0.285714286	West
0.076923077	-0.111111111	0	0.166666667		-0.111111111	Central
0	0.043478261	0.25	0		0	East
0	0.041666667	0	-0.181818182		-0.181818182	West
-0.066666667	0	0	-0.090909091		-0.090909091	Mountain
0	0.041666667	-0.333333333	0.4		-0.333333333	Mountain
0.0625	0	-0.5	0.5		-0.5	Mountain
Average						
0.044995429	-0.03951619	0.099382716	-0.097329111			

ACADEMIC VITA of Matthew Shannon

Matthew Shannon
610 Beaumont Circle
West Chester, PA 19380
matthewshannon18@gmail.com

Education: Bachelor of Science Degree in Finance, The Pennsylvania State University, Spring 2012
Minor in Statistics
Honors in Finance
Thesis Title: East Coast Bias in the NCAA Tournament
Thesis Supervisor: James Miles

Professional Experience:
Goldman Sachs Securities Summer Analyst – Summer 2011
Glenmede Financial Trust Fixed Income Summer Intern – Summer 2010

Activities:
Nittany Lion Fund Vice President, Director of Investor Relations
Distinguished Speakers Committee Member
The Next CEO Competition (1st Place)
Michigan Intercollegiate Stock Pitch Competition 2010
Independent Research for J. Randall Woolridge, PhD