

**Basketball's Cinderella Stories:**  
What Makes a Successful Underdog in the  
NCAA Tournament?

Alinna Brown

# NCAA Tournament 2016: A Year for Upsets

- Ten double digit seeds won a first round game
- Friday 3/18: Crazy day for upsets
- Eight teams of 11<sup>th</sup> seed or worse made it to the second round

# #11 Northern Iowa vs. #6 Texas (75-72)



# #14 SF Austin vs. #3 West Virginia (70-56)





# #15 Middle Tennessee State vs. #2 Michigan State (90-81)



# 2016 NCAA Tournament: By the Numbers

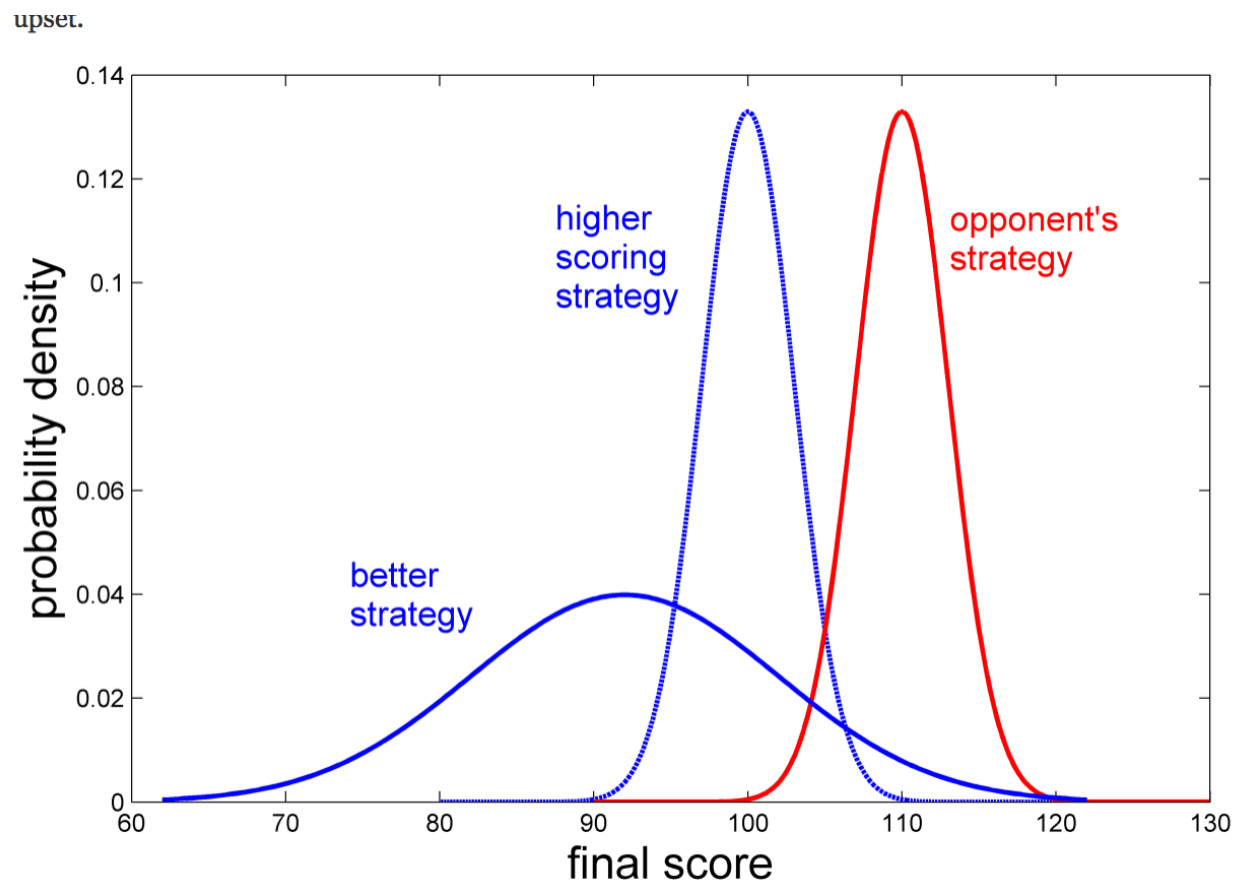
- 40 million Americans
- 70 million brackets (More than 66 million votes cast for President Obama in 2012)
- \$9 billion wagered (More than double \$3.9 billion on Super Bowl)

# Past Research

---

- Stephen Pettigrew, *Five Thirty Eight*
- Dean Oliver, *Basketball on Paper*
- Harvard Sports Analysis Collective
- Blog: Risk taking

# “Risk is the Ally of the Underdog”



# My Research

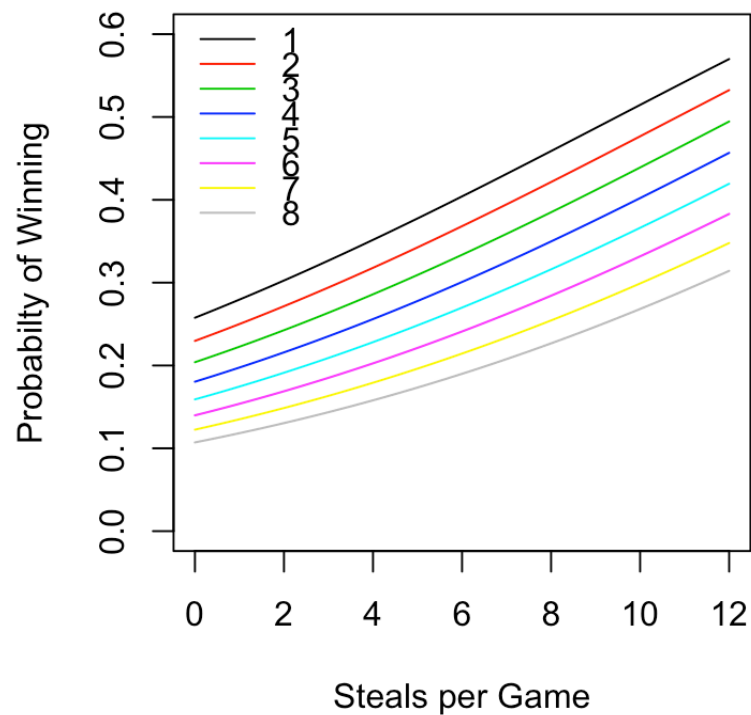
- Question: What statistics are correlated with underdog success?
  - offensive rebounds, defensive rebounds, steals, turnovers, blocks, assists, personal fouls, three pointers made
- Data: Kaggle.com March Madness Machine Learning Mania
  - 2003-2016 Regular Season Data
  - 2003-2015 Tournament Data
  - 2016 Tournament Data from ESPN



# Regression Coefficients

Seed Difference	-0.1517
Underdog Seed	0.0473
Offensive Rebounds	-0.0163
Defensive Rebounds	0.0134
Steals	0.1117
Blocks	0.0342
Turnovers	-0.0460
Assists	0.0477
Personal Fouls	-0.0259
Three Pointers Made	-0.0223

# Steals

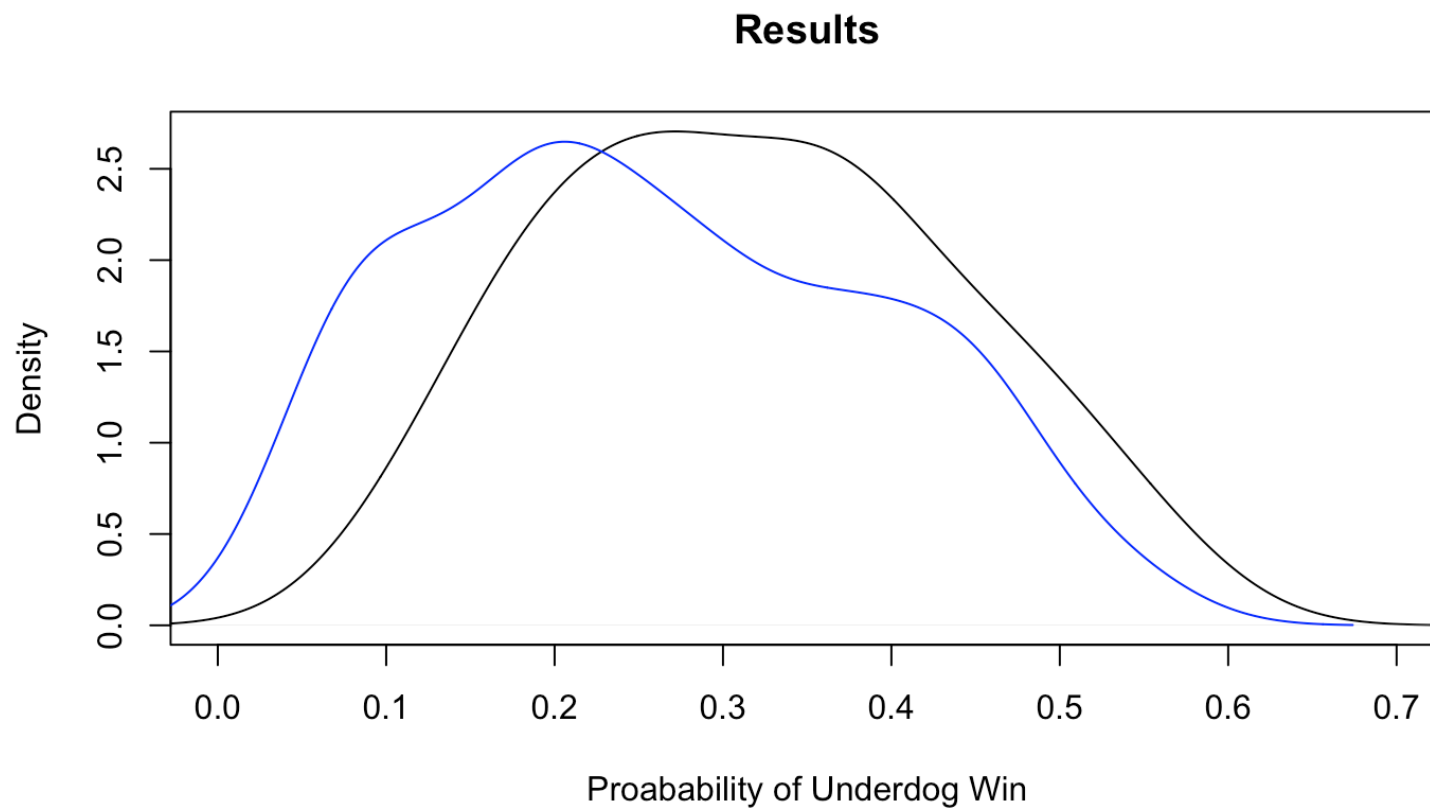


Benjamin Morris, *Five Thirty Eight*, “The Hidden Value of the NBA Steal”

- Underrated in PER
- “Irreplaceable”
- Worth 9.1 Points per game



# How good was my model?



# Predictions

1. #9 Cincinnati vs. #8 St. Joe's (0.419) (Actual Score: 78-76 L)
2. #9 Providence vs. #8 USC (0.381) (Actual Score: 70-69 W)
3. #9 Connecticut vs. #8 Colorado (0.367) (Actual Score: 74-67 W)
4. #9 Butler vs. #8 Texas Tech (0.366) (Actual Score: 71-61 W)
5. #11 Gonzaga vs. #6 Seton Hall (0.364) (Actual Score: 68-52 W)
6. #10 VA Commonwealth vs. #7 Oregon State (0.352) (Actual Score: 75-67 W)
7. #10 Syracuse vs. #7 Dayton (0.348) (Actual Score: 70-51 W)
8. #10 Pittsburgh vs. #7 Wisconsin (0.344) (Actual Score: 47-43 L)
9. #3 Texas A&M vs. #2 Oklahoma (0.340) (Actual Score: 77-63 L)
10. #10 Temple vs. #7 Iowa (0.336) (Actual Score: 72-70 L)

**<= My model**

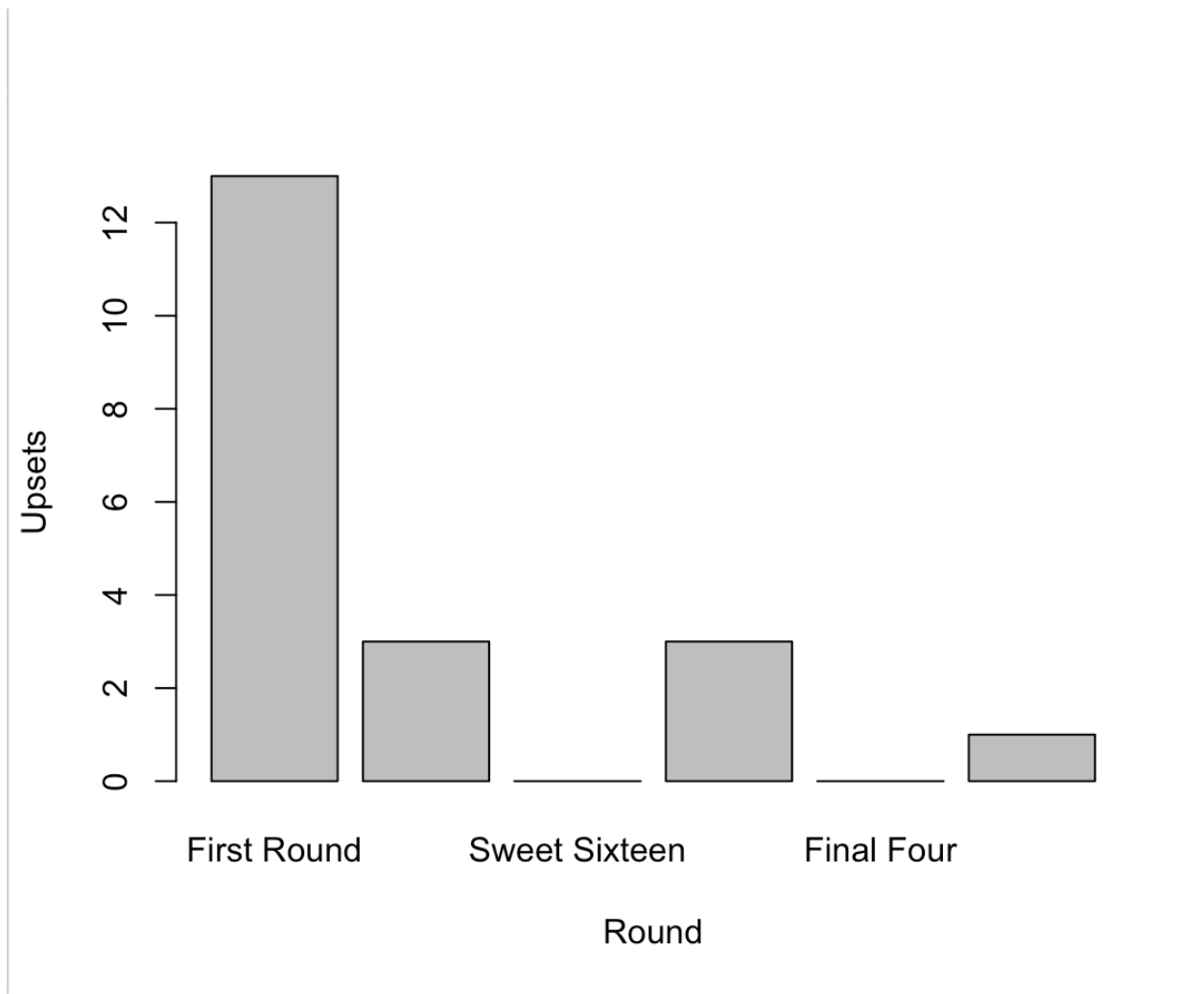
**New York Times =>**

1. #12 Yale vs. #5 Baylor
2. #11 Northern Iowa vs. #6 Texas
3. #13 Hawaii vs. #4 California
4. #12 Arkansas-Little Rock vs. #5 Purdue
5. #14 S.F. Austin vs. #3 West Virginia
6. #11 Gonzaga vs. #6 Seton Hall
7. #16 Holy Cross vs. #1 Oregon (risky)

# Gambler's Mistakes

SEED	FIRST ROUND WIN PCT	FIRST ROUND PICK PCT	DIFFERENCE
1	100.0000000%	98.1477021%	1.8522979%
2	94.3548387%	96.6014257%	-2.2465870%
3	83.8709677%	93.5711801%	-9.7002124%
4	79.8387097%	87.7982929%	-7.9595832%
5	64.5161290%	77.4995555%	-12.9834265%
6	65.3225806%	66.2511990%	-0.9286184%
7	61.2903226%	63.1861291%	-1.8958065%
8	50.8064516%	54.3998776%	-3.5934260%
9	49.1935484%	45.6001224%	3.5934260%
10	38.7096774%	36.8138709%	1.8958065%
11	34.6774194%	33.7488010%	0.9286184%
12	35.4838710%	22.5004445%	12.9834265%
13	20.1612903%	12.2017071%	7.9595832%
14	16.1290323%	6.4288199%	9.7002124%
15	5.6451613%	3.3985743%	2.2465870%
16	0.0000000%	1.8522979%	-1.8522979%

# Directions for Future Research

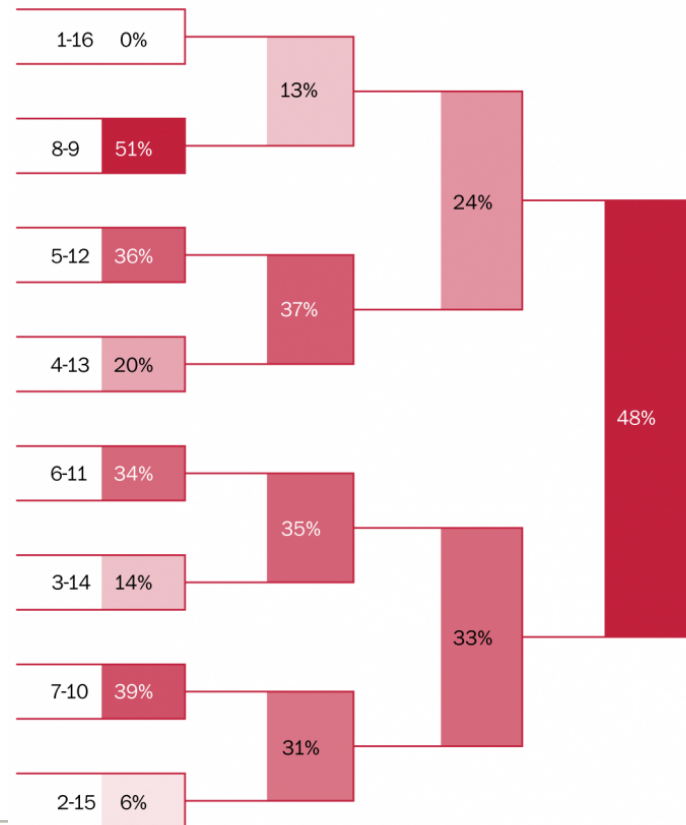


# Directions for Future Research

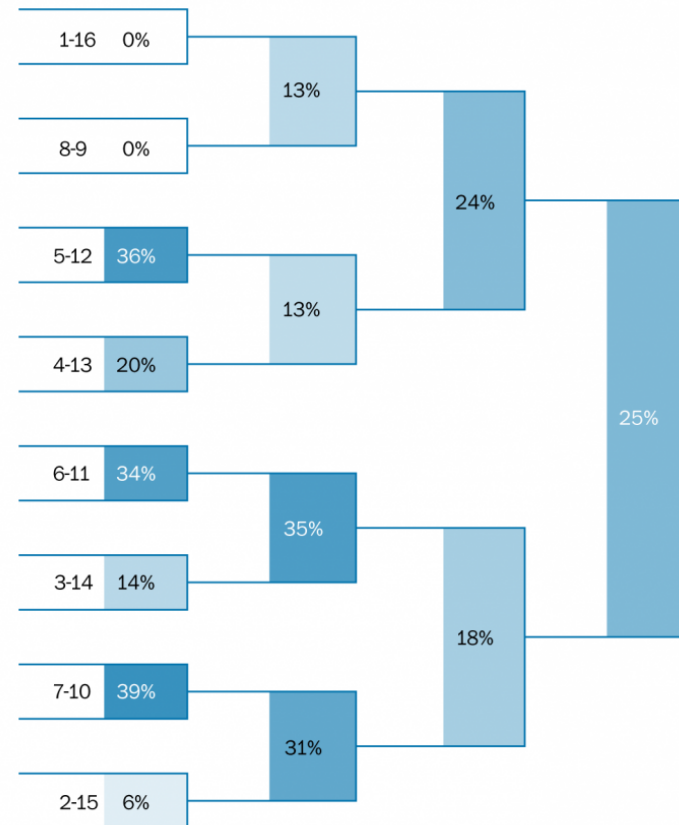
## Where the upsets happen

In pre-Final Four NCAA games since 1985.

### All games



### Excluding one-seed-difference games



# References

Brian. "Risk is the ally of the underdog." *Gravity and Levity*. 21 Dec. 2010. Web. 2 June 2016.  
<<https://gravityandlevity.wordpress.com/2010/12/21/risk-is-the-ally-of-the-underdog/>>

Bump, Philip. "Where to expect upsets on your NCAA bracket." *Washington Post*. 17 Mar. 2015. Web. 2 June 2016.  
<<https://www.washingtonpost.com/news/wonk/wp/2015/03/17/where-to-expect-upsets-on-your-ncaa-bracket/>>

Ezekowitz, John, and Andrew Cohen. "Putting Theories to the Test: Does Slow Tempo Aid NCAA Tournament Upsets?" *The Harvard Sports Analysis Collective*. 11 Feb. 2010. Web. 2 June 2016.  
<https://harvardsportsanalysis.wordpress.com/2010/02/11/putting-theories-to-the-test-does-slow-tempo-aid-ncaa-tournament-upsets/>.

Greenberg, Neil. "2016 NCAA tournament: The most likely upsets for the first round." *Washington Post*. 13 Mar. 2016. Web. 2 June 2016. <https://www.washingtonpost.com/news/fancy-stats/wp/2016/03/13/2016-ncaa-tournament-the-most-likely-upsets-for-the-first-round/>

Lyons, Tom. "What wins Basketball Games: Review of "Basketball on Paper: Rules and Tools for Performance Analysis" By Dean Oliver." *Strauss Factor Laing & Lyons*. Web. 2 June 2016. <http://www.sfandllaw.com/Articles/What-Wins-Basketball-Games-a-Review-of-Basketball-on-Paper-Rules-and-Tools-for-Performance-Analysis.shtml>

"March Madness: Upsets, Upsets, and More Upsets." *The New York Times*. 18 Mar. 2016. Web. 2 June 2016.  
<<http://www.nytimes.com/interactive/projects/cp/sports/2016-ncaa-tournament/michigan-state-loses-to-middle-tennessee>>.

# References

Mathis-Lilly, Ben. "Understanding the Underdog: How Gladwell Got Basketball Wrong." *New York Magazine*. 11 May 2009. Web. 2 June 2016. [http://nymag.com/daily/intelligencer/2009/05/malcolm\\_gladwell\\_isnt\\_a\\_basket.html](http://nymag.com/daily/intelligencer/2009/05/malcolm_gladwell_isnt_a_basket.html)

Morris, Benjamin. "The Hidden Value of the NBA Steal." *FiveThirtyEight*. 25 Mar. 2014. Web. 2 June 2016. <http://fivethirtyeight.com/features/the-hidden-value-of-the-nba-steal/>

Oliver, Dean. *Basketball on Paper*. Web. 2 June 2016. <<http://www.basketballonpaper.com>>.

Pettigrew, Stephen. "How To Tell If A March Madness Underdog Is Going to Win." *FiveThirtyEight*. 19 Mar. 2015. <<http://fivethirtyeight.com/features/how-to-tell-if-a-march-madness-underdog-is-going-to-win/>>.

Purdum, David. "Estimated 40 million fill out brackets." *ESPN*. 12 Mar. 2015. Web. 2 June 2016. <[http://espn.go.com/chalk/story/\\_/id/12465741/estimated-70-million-brackets-9-million-bets-ncaa-tournament](http://espn.go.com/chalk/story/_/id/12465741/estimated-70-million-brackets-9-million-bets-ncaa-tournament)>

Rutherford, Mike. "NCAA Tournament 2016: The best and worst from the wildest day in March Madness History." *SB Nation*. 19 Mar. 2016. Web. 2 June 2016. <<http://www.sbnation.com/college-basketball/2016/3/19/11267698/ncaa-tournament-2016-march-madness-scores-upsets-highlights-schedule-bracket>>

Tracy, Marc, and Zach Schonbrun. "Potential NCAA Bracket Busters. You've Been Warned." *New York Times*. 14 Mar. 2015. Web. 2 June 2016. <<http://www.nytimes.com/interactive/2016/03/14/sports/march-madness-upsets-ncaa-tournament-bracket.html>>



# References

Data:

Kaggle, ESPN

Images:

<http://bloximages.newyork1.vip.townnews.com/gwinnettdailypost.com/content/tncms/assets/v3/editorial/c/4f/c4f84524-d6a4-5c00-a92b-72d922b890fc/56ec95ff8aa2f.image.jpg?resize=1200%2C785>

<http://ftw.usatoday.com/2016/03/watch-northern-iowas-incredible-half-court-buzzer-beater-to-defeat-texas>

<http://www.sbnation.com/college-basketball/2016/3/18/11266364/2016-ncaa-tournament-bracket-stephen-f-austin-west-virginia>