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NFL
ALPHAS
2009-2010

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NFL Alphas for the 2009–2010 season

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For the past several years, Analytic Investors has published an analysis of NFL performance — **NFL Alphas** — ahead of the Super Bowl. This analysis seeks to answer the following question: Which NFL teams provided the best return-on-investment this season? Does success during one season translate into success in the next season? What, if anything, does this information tell us about the outcome of the upcoming Super Bowl?

In 2009, our analysis correctly identified which team was undervalued in nine out of 10 playoff games, and in the Super Bowl we correctly predicted that the Arizona Cardinals were undervalued versus the Pittsburgh Steelers (the Cardinals covered the point spread). In 2008, our analysis correctly indicated that the New York Giants were undervalued versus the undefeated and favored New England Patriots (the Giants went on to win that game outright). Will our analysis prove to be as successful for the 2010 Super Bowl? Read on to discover our insights for the 2009–2010 season.

NFL Alphas Hinge on Surprises

An NFL team earns a high Alpha by defying “investor” expectations, and its Alpha is equal to the return-on-investment (ROI) to a systematic wager on a team to win each of its games outright during the regular NFL season.¹ Just like an alpha in financial markets, an NFL Alpha can be positive only if a team’s on-the-field performance exceeds market expectations. The key to a team earning a high Alpha is not just winning games, but winning when the market expects you to lose. Furthermore, the more upset victories a team has, the higher the team’s Alpha will be.

As shown in **TABLE I**, the Oakland Raiders had the highest Alpha of all 32 teams this season. Oakland’s Alpha of 88.5% is the highest Alpha an NFL team has achieved for a single season this decade, and it is certainly the highest Alpha ever achieved by a team with a 5–11 win–loss record. Usually the team that earns the highest Alpha at least has a winning

¹An NFL Alpha is predicated on the assumption that an “investor” in a team receives the fair payoff on an investment to win outright. In reality, bookmakers never pay fair odds, but our model assumes that odds are always fair. The fair payoff is calculated as $(1/p-1)$, where p =probability of victory. For example if a team has a 25% probability of victory, then the fair payoff is 3–1 (invest \$100, win \$300). The team’s fair probability of victory is derived from a logit model, whereby we calculate the probability of victory as a function of the point spread.

record.² Yet despite the fact that the 2009 Raiders had only five wins, they were able to achieve a hugely positive Alpha. How is this possible? Of the Raiders' five victories, four of those wins were major upsets. Oakland defeated Philadelphia when they were 14-point underdogs, defeated Cincinnati when they were 8.5-point underdogs, defeated Pittsburgh when they were 15.5-point underdogs and Denver when they were 13.5-point underdogs. Oakland's probability of victory in each of these games was 13%, 25%, 11% and 14%, respectively, highlighting the hurdle that the Raiders overcame in 2009.

CHART I on the next page highlights the Raiders' season in detail. As you will see, each time there is a surprising victory, the Raiders' cumulative Alpha spikes considerably. Recall that in order to reap the rewards of a high-Alpha team, one must be invested with that team when it beats expectations, and the Raiders' wins were certainly surprising this season. The Raiders were only favored in a single game: game 9 versus the Kansas City Chiefs (the Raiders were 2.5-point favorites and they lost). Clearly, investors had a hard time figuring out the Raiders this season. In fact, the only thing consistent about the Raiders in 2009 was their inconsistency.

Conversely, a team often known for its consistency is the New England Patriots. In 2009, the Patriots delivered a solid 10–6 record, but they returned an Alpha of -16.9%. Why? The Patriots were favored in 13 of their 16 games, but won only 10 of them. Compare this to the Raiders who won 5 games, but were favored only once.

TABLE I: Alphas for All 32 NFL Teams for 2009–10

| Team | Alpha | Win/Loss | Favorite/Underdog |
|----------------------|--------|----------|-------------------|
| Oakland Raiders | 88.5% | 5-11 | 1-15 |
| Cincinnati Bengals | 45.4% | 10-6 | 7-9 |
| Indianapolis Colts | 38.7% | 14-2 | 13-3 |
| San Diego Chargers | 38.2% | 13-3 | 11-5 |
| Carolina Panthers | 27.4% | 8-8 | 6-10 |
| Arizona Cardinals | 23.3% | 10-6 | 10-6 |
| Dallas Cowboys | 16.8% | 11-5 | 14-2 |
| New Orleans Saints | 12.5% | 13-3 | 15-1 |
| Minnesota Vikings | 12.0% | 12-4 | 14-2 |
| Denver Broncos | 10.9% | 8-8 | 6-10 |
| Green Bay Packers | 9.2% | 11-5 | 12-4 |
| Philadelphia Eagles | 7.3% | 11-5 | 12-4 |
| New York Jets | 7.3% | 9-7 | 11-5 |
| Houston Texans | 5.4% | 9-7 | 10-6 |
| Miami Dolphins | -1.3% | 7-9 | 4-12 |
| Kansas City Chiefs | -4.7% | 4-12 | 2-14 |
| Atlanta Falcons | -4.7% | 9-7 | 8-8 |
| Buffalo Bills | -5.5% | 6-10 | 4-12 |
| Tampa Bay Buccaneers | -7.2% | 3-13 | 0-16 |
| Jacksonville Jaguars | -7.8% | 7-9 | 5-11 |
| San Francisco 49ers | -9.3% | 8-8 | 8-8 |
| Tennessee Titans | -11.6% | 8-8 | 9-7 |
| Pittsburgh Steelers | -15.4% | 9-7 | 15-1 |
| Chicago Bears | -16.1% | 7-9 | 7-9 |
| New England Patriots | -16.9% | 10-6 | 13-3 |
| New York Giants | -18.3% | 8-8 | 11-5 |
| Cleveland Browns | -18.4% | 5-11 | 2-14 |
| Baltimore Ravens | -24.0% | 9-7 | 11-5 |
| Seattle Seahawks | -48.6% | 5-11 | 6-10 |
| Washington Redskins | -57.1% | 4-12 | 5-11 |
| Detroit Lions | -69.7% | 2-14 | 2-14 |
| St. Louis Rams | -84.6% | 1-15 | 0-16 |

Source: www.nfl.com

²Besides the unlikely 2009 Raiders, the only other teams to deliver an Alpha over 75% this decade were the 2004 Pittsburgh Steelers (81.3%) and the 2001 New England Patriots (78.5%). In 2004, rookie quarterback Ben Roethlisberger led the Steelers to a 15–1 record and the team would have gone to the Super Bowl if not for the team's loss to the Patriots in the AFC Championship game. In 2001, the 11–5 New England Patriots went on to defeat the St. Louis Rams in Super Bowl XXXVI, with quarterback Tom Brady at the helm in his first starting season.

CHART I: Oakland Raiders

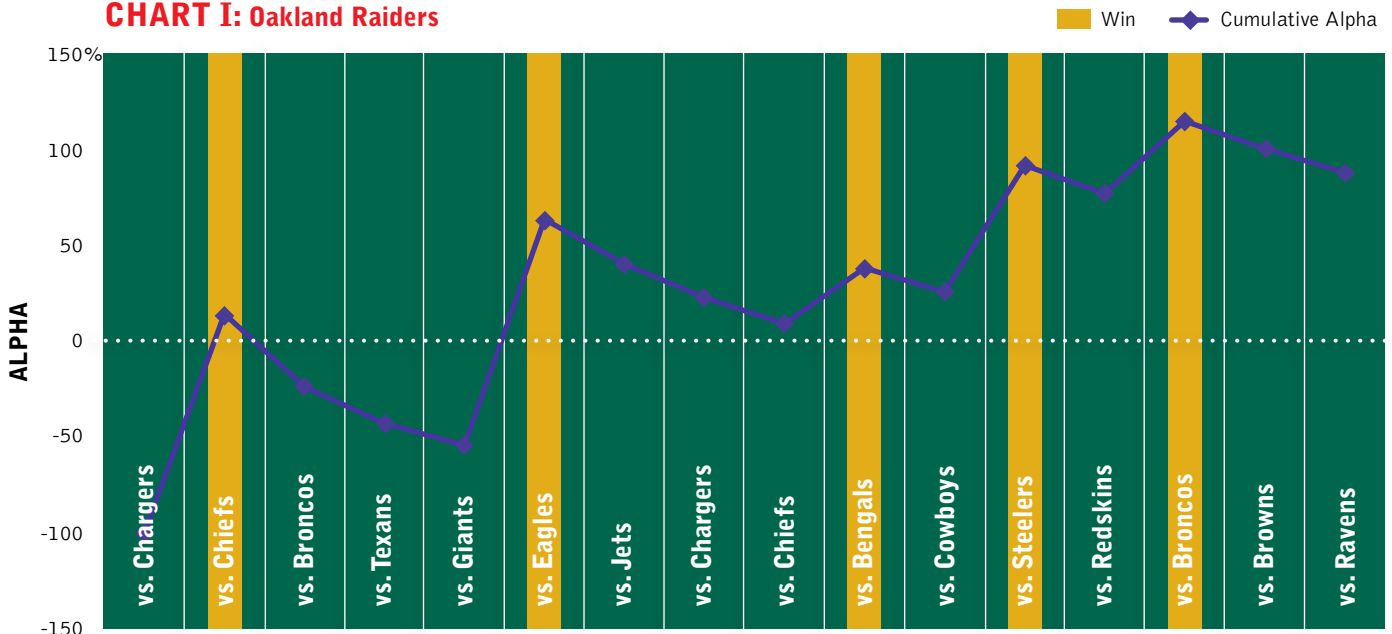


CHART II: New England Patriots

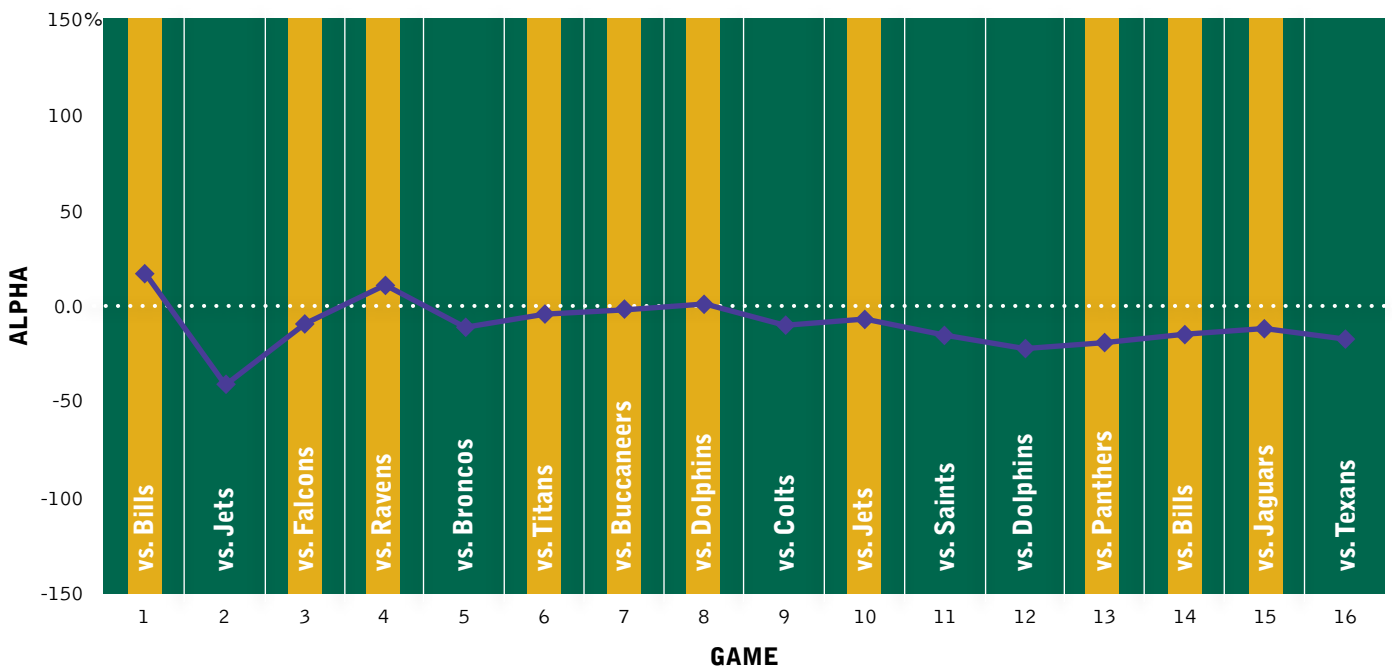


CHART II shows how the loss to the Jets in week 2 dragged down the team’s ROI, together with the loss to Denver in week 5 and the loss to Miami in the team’s 12th game (all games in which the Patriots were favored).

Likewise, note how little marginal Alpha the Patriots realized even when they did win. For example, New England beat the Tampa Bay Buccaneers in week 7, yet their Alpha barely budged. Why? In that game, the Patriots were 15.5-point favorites, which means

their probability of victory was 89%. Therefore, the fair payoff to an investment in a New England victory for this game was only 1.12–1. In other words, an investor putting \$1 on New England would have only earned \$0.12 for his or her correct prediction. It is very difficult for any team to achieve a high Alpha when it is a heavy favorite week in and week out. In 2009, it appears that the Patriots were victims of the market’s high expectations. Nonetheless, the Patriots still managed to make it to the first round of the playoffs, but they disappointed market expectations again by losing to the underdog Baltimore Ravens.

Interestingly, Baltimore was the only playoff team with a lower Alpha than New England’s -16.9%. The Ravens delivered an absolutely dismal Alpha of -24.0%. Baltimore was favored in fewer games than the Patriots (investors expected the Ravens to win 11 of their 16 games), but the Ravens unexpectedly lost twice to the Cincinnati Bengals and their Alpha never recovered.

Mean Reversion from Season to Season

Over the past several years, investors have either wildly overestimated or underestimated their expectations for the Baltimore Ravens. As a reflection of this, the NFL Alpha of the Baltimore Ravens has actually reversed its sign every year since 2005 (see **TABLE II**).

TABLE II: The Baltimore Ravens — A Hard Team to Predict

| Year | NFL Alpha |
|------|-----------|
| 2009 | -24.0% |
| 2008 | 34.5% |
| 2007 | -48.7% |
| 2006 | 46.3% |
| 2005 | -36.9% |

The phenomenon of a mean-reverting Alpha is not that uncommon. In prior research,³ we have found some evidence that bettors systematically overestimate the likelihood of victory for the higher-Alpha teams the following year. In other words, teams that outperform expectations one season on average underperform expectations the next season and vice versa. **TABLE III** shows the teams that exhibited the largest change in Alpha between last season and this season. At the top of the chart are the “positive surprises,” such as the Raiders, the Bengals and the Chargers. At the bottom of the chart are the “negative surprises”—the Redskins, the Dolphins, the Ravens and the Titans.

³Sapra, S. “Evidence of betting market intra-season efficiency and inter-season over-reaction to unexpected NFL team performance 1988–2006.” *Journal of Sports Economics*, vol. 9, no. 5 (2008), pp. 488–503.

TABLE III: Change in Team Alphas Between the 2008–09 Season and the 2009–10 Season

| Team | ALPHA | | Change |
|----------------------|---------|---------|--------|
| | 2008–09 | 2009–10 | |
| Oakland Raiders | 10.4% | 88.5% | 78.1% |
| Cincinnati Bengals | -26.6% | 45.4% | 72.0% |
| San Diego Chargers | -24.1% | 38.2% | 62.3% |
| Kansas City Chiefs | -59.5% | -4.7% | 54.8% |
| Green Bay Packers | -32.7% | 9.2% | 41.9% |
| Dallas Cowboys | -15.8% | 16.8% | 32.6% |
| Arizona Cardinals | -7.5% | 23.3% | 30.8% |
| Detroit Lions | -100.0% | -69.7% | 30.3% |
| New Orleans Saints | -14.3% | 12.5% | 26.8% |
| Jacksonville Jaguars | -33.7% | -7.8% | 25.9% |
| Indianapolis Colts | 28.8% | 38.7% | 9.9% |
| Buffalo Bills | -12.9% | -5.5% | 7.4% |
| Philadelphia Eagles | 0.1% | 7.3% | 7.2% |
| Cleveland Browns | -24.2% | -18.4% | 5.8% |
| Houston Texans | -0.1% | 5.4% | 5.5% |
| Tampa Bay Buccaneers | -9.8% | -7.2% | 2.6% |
| Denver Broncos | 9.0% | 10.9% | 1.9% |
| New York Jets | 5.8% | 7.3% | 1.5% |
| Minnesota Vikings | 11.2% | 12.0% | 0.8% |
| Seattle Seahawks | -45.0% | -48.6% | -3.6% |
| Carolina Panthers | 34.6% | 27.4% | -7.2% |
| San Francisco 49ers | -1.9% | -9.3% | -7.4% |
| New England Patriots | 5.5% | -16.9% | -22.4% |
| Chicago Bears | 12.9% | -16.1% | -29.0% |
| New York Giants | 20.8% | -18.3% | -39.1% |
| St. Louis Rams | -42.5% | -84.6% | -42.1% |
| Pittsburgh Steelers | 34.4% | -15.4% | -49.8% |
| Atlanta Falcons | 46.0% | -4.7% | -50.7% |
| Tennessee Titans | 40.2% | -11.6% | -51.8% |
| Baltimore Ravens | 34.5% | -24.0% | -58.5% |
| Miami Dolphins | 63.2% | -1.3% | -64.5% |
| Washington Redskins | 19.3% | -57.1% | -76.4% |

The Tennessee Titans were one of the most disappointing teams in 2009. After an impressive 13–3 season in 2008 and an Alpha of 40.2%, many investors expected the Titans to be heading back to the playoffs in 2009. But in September–October, the Titans proceeded to lose their first six games in a row. While head coach Jeff Fisher managed to right the ship mid-season (in November, the team was undefeated and quarterback Vince Young emerged as a somewhat reliable team leader), it was already too late for investors to recover their ROI. The Titans ended the season with an 8–8 record and an Alpha of -11.6%.

On the positive side, the Cincinnati Bengals are perhaps the best example of a team that outperformed investor expectations in 2009. In 2008, the Bengals had an Alpha of -26.6% and a 4–11–1 record (due to that bizarre tie game they had with the Philadelphia Eagles). In 2009, the 10–6 Bengals' Alpha improved to 45.4% as they beat favored teams such as the Green Bay Packers and the Pittsburgh Steelers. Their two surprising victories over the Steelers and their two victories over the Ravens allowed the Bengals to win the AFC North Division Title and head to the playoffs for the first time since 2005. However, just when investors were starting to get used to the idea of a winning Bengals team, they promptly lost to the New York Jets in the first round of the playoffs. This is actually an interesting phenomenon that we have observed year after year. After defying investor expectations throughout the regular season, it is not uncommon for a high-Alpha team to underperform in the postseason.

Evaluating the Postseason

When bettors formulate a team's probability of victory during the regular season, they typically overemphasize a team's prior year's performance. When it comes to evaluating each team's probability of victory in the postseason, we believe that a similar phenomenon holds true.

Assuming that the playoffs constitute the "next" season, we believe that the best strategy for making NFL postseason predictions is to favor the lower-Alpha team in each respective game. It is important to note that we do not necessarily believe the lower-Alpha team will win outright, rather, we believe that the market systematically underestimates the lower-Alpha team's probability of victory.

Like in 2008, the edge in this season's playoffs went to the lower-Alpha teams. A bettor investing in lower-Alpha teams throughout the playoffs would have been correct in six of ten playoff games. The low-Alpha New York Jets (7.3%) beat two high-Alpha teams outright, defeating the Cincinnati Bengals (45.4%) and the San Diego Chargers (38.2%) on consecutive weekends. The low-Alpha Baltimore Ravens (-24.0%) soundly beat the New England Patriots (-16.9%), and the New Orleans Saints (12.5%) trounced the Arizona Cardinals (23.3%). Likewise, the lower-Alpha Minnesota Vikings (12.0%) defeated the higher-Alpha Dallas Cowboys (16.8%).

TABLE IV: Postseason Analysis

| Higher-Alpha Team | Win-Loss | Lower-Alpha Team | Win-Loss | Prediction Correct |
|-------------------------------|----------|----------------------------|----------|--------------------|
| W I L D C A R D | | | | |
| Cincinnati Bengals (45.4%) | Loss | New York Jets (7.3%) | Win | ✓ |
| Dallas Cowboys (16.8%) | Win | Philadelphia Eagles (7.3%) | Loss | |
| New England Patriots (-16.9%) | Loss | Baltimore Ravens (-24.0%) | Win | ✓ |
| Arizona Cardinals (23.3%) | Win | Green Bay Packers (9.2%) | Loss | |
| D I V I S I O N | | | | |
| Arizona Cardinals (23.3%) | Loss | New Orleans Saints (12.5%) | Win | ✓ |
| Indianapolis Colts (38.7%) | Win | Baltimore Ravens (-24.0%) | Loss | |
| Dallas Cowboys (16.8%) | Loss | Minnesota Vikings (12.0%) | Win | ✓ |
| San Diego Chargers (38.2%) | Loss | New York Jets (7.3%) | Win | ✓ |
| C O N F E R E N C E | | | | |
| Indianapolis Colts (38.7%) | Win | New York Jets (7.3%) | Loss | |
| New Orleans Saints (12.5%) | Win | Minnesota Vikings (12.0%) | Loss* | ✓ |

*While the Vikings did lose to the Saints, the prediction is correct because the Vikings covered the point spread.

In the AFC Championship game, the edge did not go to the lower-Alpha team. While the lower-Alpha Jets (7.3%) did lead the higher-Alpha Indianapolis Colts (38.7%) by 11 points at one point in the game, the Colts went on to score 24 unanswered points to win the game 30–17, allowing them to advance to the Super Bowl for the second time in quarterback Peyton Manning’s career.

In the NFC Championship game, the edge did go to the lower-Alpha team. Even though the lower-Alpha Vikings (12.0%) lost to the higher-Alpha Saints (12.5%), the Saints won by only three points (due to a field goal scored in overtime). Since the point spread for the game was -3.5 in favor of the Saints, the Saints fell short of the spread by -0.5 points. Therefore, an investment in the lower-Alpha Vikings (12.0%) would have paid off for investors.

So, what do these postseason results mean for the Super Bowl on February 7, 2010? Will investing in the lower-Alpha team prove to be a winning strategy? It has been a winning strategy for the past decade: Lower-Alpha teams have either won outright or defied better expectations in eight of the past 10 Super Bowls (see **TABLE V**).

Let’s examine this year’s matchup in terms of Alpha. The Indianapolis Colts have an Alpha of 38.7% for the regular season, while the New Orleans Saints have an Alpha of 12.5%. Because the Colts are the higher-Alpha team, we believe that bettors will tend to overestimate their probability of victory. This means that the Saints are undervalued versus the Colts. It is important to note that we do not necessarily believe that the Saints will be the outright winner of the Super Bowl. Rather, we believe that bettors are overestimating the Colts’ probability of victory.

TABLE V: Over the Last Decade, the Market has Systematically Underestimated the Lower-Alpha Teams’ Probability of Victory in the Super Bowl

| Super Bowl | Date | Higher-Alpha Team | Lower-Alpha Team | Favorite | Result | Prediction Correct |
|------------|--------|------------------------------|-----------------------------|------------------|-----------------|--------------------|
| XXXIV | Jan–00 | Tennessee Titans (47.9%) | St. Louis Rams (18.9%) | Rams by 7 | Rams 23-16 | n/a [†] |
| XXXV | Jan–01 | New York Giants (35.4%) | Baltimore Ravens (16.0%) | Ravens by 3 | Ravens 34-7 | ✓ |
| XXXVI | Feb–02 | New England Patriots (78.5%) | St. Louis Rams (15.6%) | Rams by 14 | Patriots 20-17 | |
| XXXVII | Jan–03 | Tampa Bay Buccaneers (19.4%) | Oakland Raiders (19.2%) | Raiders by 3.5 | Bucs 48-21 | |
| XXXVIII | Feb–04 | New England Patriots (67.7%) | Carolina Panthers (39.4%) | Patriots by 7 | Patriots 32-29* | ✓ |
| XXXIX | Feb–05 | New England Patriots (33.7%) | Philadelphia Eagles (12.0%) | Patriots by 7 | Patriots 24-21* | ✓ |
| XL | Feb–06 | Seattle Seahawks (22.6%) | Pittsburgh Steelers (8.4%) | Steelers by 4 | Steelers 21-10 | ✓ |
| XLI | Feb–07 | Chicago Bears (17.1%) | Indianapolis Colts (15.3%) | Colts by 7 | Colts 29-17 | ✓ |
| XLII | Feb–08 | New England Patriots (22.6%) | New York Giants (15.4%) | Patriots by 12.5 | Giants 17-14 | ✓ |
| XLIII | Feb–09 | Pittsburgh Steelers (34.4%) | Arizona Cardinals (-7.5%) | Steelers by 6.5 | Steelers 27-23* | ✓ |
| XLIV | Feb–10 | Indianapolis Colts (38.7%) | New Orleans Saints (12.5%) | Colts by 5.5 | ???????? | |

*While in these games lower-Alpha teams did lose to the higher-Alpha teams, the predictions are correct because the lower-Alpha teams covered their respective point spreads.

[†]The Rams met expectations in Super Bowl XXXIV, thus the prediction is neither correct nor incorrect.

Will it be Peyton or Payton?

Peyton Manning's ability to flummox defenses can be downright discouraging to his opponents, and his talent has allowed the Colts to take insurmountable leads in the second halves of many games this season. However, remember that New Orleans' head coach Sean Payton is one of the most creative play-callers in the NFL, and this is the first time the Saints are going to a Super Bowl in the history of that team's beleaguered franchise. As of this writing, the Colts are 5.5-point favorites in Super Bowl XLIV. Again, while we are not definitively saying that the Saints will be the outright winner of the Super Bowl, we do believe that the Saints are undervalued versus the Colts.

Summary

Alphas measure the return-on-investment for investing in a particular NFL team over the course of the regular season. Investors are rewarded when their team wins, and they are most greatly rewarded when their team defies expectations and wins when no one expects them to win. When it comes to making postseason predictions, there is some evidence that bettors tend to overvalue the highest-Alpha teams the next season and vice versa. We have seen some evidence that trends that are established during the regular season reverse themselves in the postseason. Therefore, we believe that it is better to favor the lower-Alpha team in each respective postseason game.



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