

Shangri-La Investing

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Head-to-head game

New England Patriots

Denver Broncos

(circle winner)

Bet: \$ _____

2011 Season: Wins Contest

New England Patriots

Denver Broncos

(circle winner)

Bet: \$ _____

Go ahead - grab a pen and take me up on both, one, or none of the bets offered above. You pick the team you want and name the dollar amount you'd care to bet. I'm going to focus primarily on the second bet (Wins Contest), so make sure you think about that one.

For those of you who are not fans of professional football, the New England Patriots finished the 2010 season with the best record in the league at 14-2, while the Broncos were an abysmal 4-12. Only the Carolina Panthers (2-14) won fewer games than the Broncos, with the Cincinnati Bengals (4-12) and Buffalo Bills (4-12) matching Denver in the ineptitude department. By contrast, it's pretty rare for any team in the league to win more than 14 games in a season. To state the obvious, the Patriots were much, much better than the Broncos in 2010.

The Patriots have been on a remarkable run which started during the 2001 season. Over that ten year period, they made the playoffs eight times and won three championships. Their 12.1 average wins per season are the most in the league. Their *worst* season was 2002, when they went 9-7. In fact, the Patriots are the only team in the league to have a winning record in each of the past ten seasons. The Colts came close with nine consecutive double-digit win seasons from 2002 to 2010, but laid an egg in 2001 with a 6-10 record.

The Broncos have been a relatively mediocre franchise over the past decade. They have won an average of 8.6 games per season, have three playoff appearances, and haven't appeared in the Super Bowl since the 1998 season. Don't get me wrong, there are many teams that are far worse

than Denver. They finished 13-3 in 2005, and hosted the AFC Championship game that year. Generally speaking, the Broncos have been competitive. They haven't been terrible – just mediocre.

The only really ugly year was 2010, when they won four games. Their disgruntled fans might fairly have referred to them as the enver Broncos – there was no D in Denver last year. Denver's defense gave up the most yards per game (390.8) and the most points per game (29.4) in the entire league. In sixteen contests, they only allowed less than twenty points twice, and gave up more than thirty points seven times! SEVEN times! The Raiders, of all teams, scored an average of forty-nine points in their two wins over Denver. The Denver offense was actually pretty decent, but in some respects, it's amazing that the Broncos even won four games given how poor they were on the defensive side of the ball.

The Patriots scored the most regular season points in the league by a wide margin. They averaged 32.4 points, while the next best team came in at 27.6 (San Diego). The league-wide average was 22, demonstrating how dominant New England was last year offensively. They must surely be licking their chops at the prospect of playing the Denver defense in 2011.

Back to the questions at hand. Who do you think will win the head-to-head contest in December 2011 between a team that won four games in 2010 and the team that finished with the NFL's best record? And who will win more games throughout the 2011 season?

At this point, you have probably sprinted over to grab a pen, circled New England on both bets, written down numbers with lots of zeroes attached to them on the bet lines, and called your favorite travel agent to book a month-long trip to Aruba because of this expected windfall you have just stumbled into. Is there any doubt based on the evidence displayed that the New England Patriots are currently a superior football team and stand a high degree of probability of beating the Broncos in their head-to-head meeting this year and finishing with a better full-season record? There is little doubt in the mind of any rational statistician or sports fan.

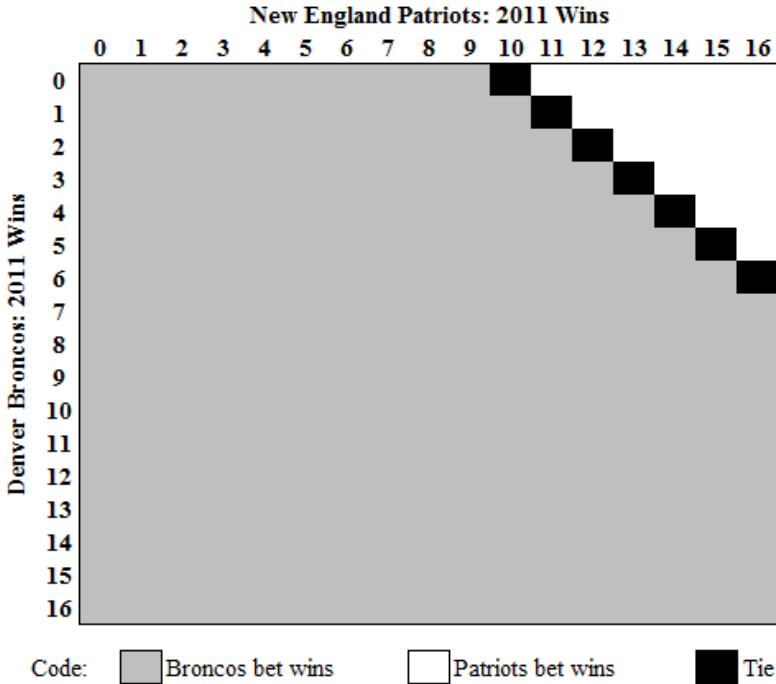
You may be pondering several questions right now:

- 1) Why would this crazy author agree to take the Broncos in either of these bets, and probably more baffling, why would he let me bet unlimited amounts on the outcomes?
- 2) Why did I buy an investment book written by someone so careless with money that he would be willing to bet large sums on one of the worst teams in the NFL faring better than the best team?

Well, I have a confession to make. I didn't tell you a few minor details about these contests. In keeping with Vegas bookmaking tradition, there will be a point spread in effect for the individual games. Being the better team, the Patriots will be favored by a certain amount. If you bet on the Patriots, they need to win by more than that amount in order for you to win the bet. If you bet on the Broncos, you win if the Broncos win the game outright or lose by less than that amount. So if the Patriots are favored by 21 points and they win 28-6, whoever bet on the Patriots will win. If they win 28-8, then whoever bet on the Broncos will win.

In the Wins Contest, I'm also going to level the playing field. The bet is not on which team wins more games in 2011, but rather which team improves its win total by more games relative to 2010. As a reminder, New England won fourteen games in 2010, while Denver won four. So if they both repeat those win totals in 2011, we will tie and neither of us will win the bet. If New England wins fourteen games and Denver wins five, then whoever bets on Denver will win, because Denver's improvement (one extra win) is greater than New England's improvement (zero extra wins). If New England only wins eleven games (three fewer wins) and Denver only wins two (two fewer wins), then whoever selects Denver will win the bet.

A chart might help visually explain the payout matrix:



There are relatively few combinations that can lead New England to win this bet outright. Out of 256 possible outcomes, only 21 (8%) result in a Patriots win, 7 (3%) result in a tie, and the remaining 228 (89%) result in a Broncos win. The Patriots must be close to perfect and the Broncos must be terrible in order for the New England bet to pay off.

In fact, if the Broncos simply manage to go 7-9, there is no way for them to lose this bet, even if the Patriots defy the odds and finish 16-0. Some coaches get fired for winning only seven games, but in this case, the Denver bettor would be doing cartwheels and sending buckets of champagne to the Broncos' locker room.

On the flip side, even if the Broncos prove to be the worst team in league history with a 0-16 mark, New England would still have to post a solid eleven-win season against a first-place schedule in order to win this bet. If the Patriots win ten games, that would result in a tie. To put ten wins in

context, four of the eight division winners in 2010 failed to win more than ten games. It's not easy.

When I first asked you the question, you likely chose to bet large sums of money on the Patriots to win both bets. I would too. But now that you know the rules of the game, how would you bet?

Head-to-head contest

New England Patriots

Denver Broncos

(21 point spread)

Bet: \$ _____

2011 Season: Wins Contest

New England Patriots

Denver Broncos

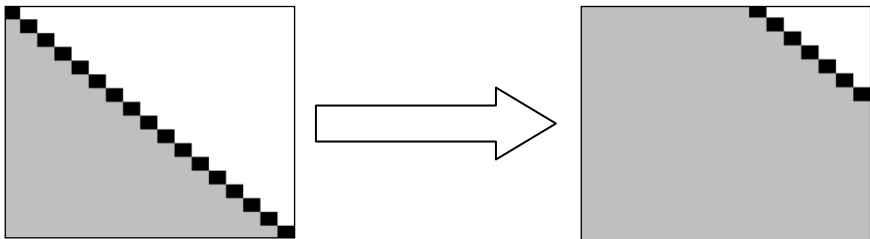
(circle winner)

Bet: \$ _____

If you're like most people, two things happened:

- 1) It took you longer to decide which side of the bet to take (even if you still did bet on New England)
- 2) You bet less money than before

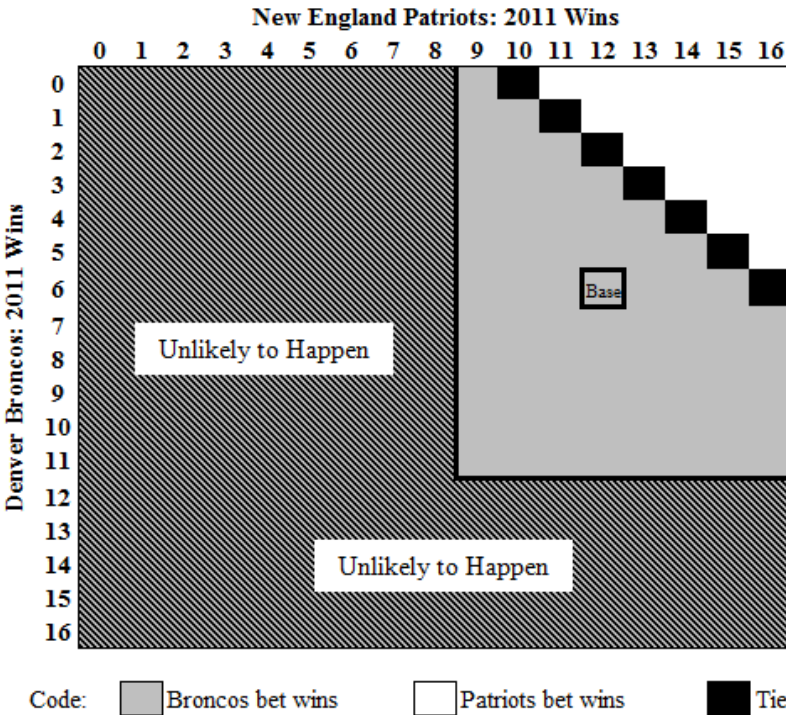
Let me focus for a while on the Wins Contest. In essence, I've changed the outcome structures as following:



To be fair, not all of the gray spaces on the modified chart stand an equal chance of occurring. Let's just face facts: the Broncos are not going to go undefeated and the Patriots are not going to go winless (which is what the lower left corner of the chart represents). To adjust for this reality, I've created a second chart which takes out the unlikely outcomes and keeps those that could feasibly happen. For the purpose of this exercise, I am

assuming that the Patriots are capable of repeating its worst season in recent memory (9-7) and the Broncos are capable of returning to the playoffs with an 11-5 record.

I've also circled my base case – if you forced me to guess right now, I would imagine that the Patriots will remain one of the best teams in the league with an impressive twelve wins, while the Broncos will make steady, albeit sometimes frustratingly slow, progress in their multi-year rebuilding process with a six win season.



Now we are left with 96 spaces that represent feasible outcomes, with 21 (22%) still favoring the New England side of the bet, 7 (7%) still resulting in a tie, and the remaining 68 (71%) favoring a Denver bettor. Your decisions on whether to bet on New England or Denver and how much to bet will likely be influenced by the following factors:

- 1) *Where you would draw the “feasible” border on this chart.*
Perhaps you believe that Tim Tebow is ready to make the jump in his second year as a pro quarterback and Denver could actually win thirteen games if their new coach, the defensive-minded John Fox, is able to turn around that side of the ball. Maybe you believe that New England could win only six games if Tom Brady is injured. Perhaps you believe that Denver has no chance of winning more than five games, but that New England is unlikely to win more than fourteen games. All else equal, the more gray squares (Denver) on the chart relative to the number of white squares (New England), the more likely you are to pick Denver and bet a higher amount of money. If there are just as many gray squares as there are white squares, you will probably limit the size of your bet and may be indifferent between the two teams.

- 2) *What you believe to be the base case and what your degree of confidence is in that selection.* If you are convinced that New England will win 16 games and Denver will win zero games, you will bet on the Patriots and may wager a significant sum of money. If your expected outcome falls somewhere near the tie zone, it would be logical to only bet a small sum of money.

For now, though, let’s use my version of the chart. Visually, there are many more gray squares than white squares, which would seem to favor taking the Broncos side of the bet. My base case is for the Patriots to win twelve games and for the Broncos to win six. Twelve wins is a significant accomplishment, given how competitive the NFL is. In an average NFL season, guess how many teams have won more than twelve games each year over the past decade? 2.4. Every year, only a handful of teams outperform the win total that I’m expecting the Patriots to notch this year.

In the twenty seasons dating back to 1991, guess how many times the Broncos only won six games? Twice. They went 4-12 in 2010, and 6-10 in 1999. As mentioned before, Denver is not a bad franchise by any stretch.

So, if anything, maybe I'm being too conservative with my Denver guess. The Broncos have a new head coach who is expected to return the defense to respectability. They have some talented young players, and have a fairly easy schedule. Six wins would still leave them out of the playoffs and be classified as a below-average season. I think it is a realistic estimate, but if I had to take the over/under, I'd bet they'll win more than six.

I would take the Broncos side of this bet and would wager a considerable amount of money. Here's why:

- 1) My base case falls in the gray (Broncos) zone
- 2) Of the 96 possible outcomes on my expectations grid, only 21 cause me to lose the bet. That's a 22% chance of loss.
- 3) My base case is a few games away from the breakeven (black) zone, giving me a nice margin of safety.

The third point is critical and provides me with the confidence to place a large wager on the Broncos in this contest. Notice that I expect the Patriots to win a very solid twelve games and for the Broncos to struggle with a 6-10 record this season. I could be dead wrong about the Patriots. They may be the greatest team in NFL history, going 16-0. But as long as Denver manages to scrape by with my base case estimate, I will tie the bet and get my money back.

Conversely, maybe I'm wildly wrong about Denver. Perhaps this truly is the worst team in pro football history and is destined to lose all of its games. Even if New England posts a decent 10-6 record, the outcome will be a push and I will not lose any money.

In other words, a lot can go wrong with my assumptions and my bet may still prove to be fruitful. A large margin of safety has been generated. If I were to instead take New England, everything would have to go right for me to win. To demonstrate the tightrope I would need to walk, imagine if Denver and New England both start the season 4-4. Guess what? Contest over. If Tom Brady injures his shoulder and has to sit out for a month or

two, it might as well be over. If Denver manages to beat New England in their head-to-head meeting, the scales would tip significantly in favor of the Broncos side of the bet because it would give one loss to New England *and* one win to Denver, even though it would not clinch anything.

To bet on New England and win, both teams would have to defy the odds. Poor teams are allotted high draft picks and an easy schedule the next year, which improves their chances of winning more games. Successful teams are allotted low draft picks, their best players are targeted by other teams in free agency, and are given a difficult schedule the following year, all of which stacks the deck against them. While it is not impossible to win fourteen games two straight years or win only four games in consecutive seasons, it takes an organization of an exceptionally strong or incredibly inept nature to pull it off.

I'm going to alter the contest one last time. Up to this point, the payout amount has been static and determined ex-ante. That is to say, at the start of the season, you indicated which team you would like to bet on, and the dollar amount. If you wagered \$100, the only three possible outcomes are: you win \$100, you lose \$100, or we tie and there is no payout on either side. With investing, we generally do not have the luxury of knowing the magnitude of possible outcomes ahead of time and there are far more than three possible outcomes.

To bring this analogy full circle, therefore, the payout structure of our football bet is going to be changed. Now, for every one game difference, the payout changes by \$100. If the Patriots win thirteen games (a decline of one win) and the Broncos win six games (an increase of two wins), whoever bet on the Patriots owes \$300 to the person who bet on the Broncos. If the Patriots go 16-0 and the Broncos go 0-16, the Broncos bettor pays \$600 to the Patriots bettor. Again, the payout matrix might help bring this into focus:

		New England Patriots: 2011 Wins																
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Denver Broncos: 2011 Wins	0	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100	\$200	\$300	\$400	\$500	\$600
	1	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100	\$200	\$300	\$400	\$500
	2	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100	\$200	\$300	\$400
	3	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100	\$200	\$300
	4	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100	\$200
	5	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100
	6	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0
	7	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100
	8	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200
	9	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300
	10	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400
	11	\$2,100	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500
	12	\$2,200	\$2,100	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600
	13	\$2,300	\$2,200	\$2,100	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800	\$700
	14	\$2,400	\$2,300	\$2,200	\$2,100	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900	\$800
	15	\$2,500	\$2,400	\$2,300	\$2,200	\$2,100	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000	\$900
	16	\$2,600	\$2,500	\$2,400	\$2,300	\$2,200	\$2,100	\$2,000	\$1,900	\$1,800	\$1,700	\$1,600	\$1,500	\$1,400	\$1,300	\$1,200	\$1,100	\$1,000

Code: Broncos bet wins Patriots bet wins Tie

This time, you simply choose a team without having to designate a bet amount. Think it over, and make your choice.

2011 Season: Wins Contest

New England Patriots

Denver Broncos

Again, let's be realistic. That \$2,600 payout has such a remote possibility of occurring that it is barely worth considering. I personally would alter the matrix to account for my expectations as follows:

		New England Patriots: 2011 Wins																		
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Denver Broncos: 2011 Wins	0												\$100	\$0	\$100	\$200	\$300	\$400	\$500	\$600
	1												\$200	\$100	\$0	\$100	\$200	\$300	\$400	\$500
	2												\$300	\$200	\$100	\$0	\$100	\$200	\$300	\$400
	3												\$400	\$300	\$200	\$100	\$0	\$100	\$200	\$300
	4												\$500	\$400	\$300	\$200	\$100	\$0	\$100	\$200
	5												\$600	\$500	\$400	\$300	\$200	\$100	\$0	\$100
	6												\$700	\$600	\$500	\$400	\$300	\$200	\$100	\$0
	7												\$800	\$700	\$600	\$500	\$400	\$300	\$200	\$100
	8												\$900	\$800	\$700	\$600	\$500	\$400	\$300	\$200
	9												\$1,000	\$900	\$800	\$700	\$600	\$500	\$400	\$300
	10												\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500	\$400
	11												\$1,200	\$1,100	\$1,000	\$900	\$800	\$700	\$600	\$500
	12																			
	13																			
	14																			
	15																			
	16																			

Code: Broncos bet wins Patriots bet wins Tie

Clearly, the asymmetrical nature of this distribution favors the Broncos side of the bet. The Patriots bet has a natural cap of \$600, since it is impossible to do better than 16-0 or worse than 0-16. My expected outcome (Patriots win 12, Broncos win 6) has a payout of \$400 and thus contains a fairly significant margin of safety. Even if I am completely wrong about both teams, the magnitude of my downside risk (\$600) is still not too far away from to my expected base case return (\$400). If both teams wind up with 9-7 records, I would win \$1,000. I am happy with this version of the contest, because based on my estimates, the margin of safety limits my downside risk, increases my expected return, and offers a variety of ways for me to win the bet with a satisfying payout.

It's not quite as preferable as a dollar-for-dollar bet which allows me to simply pick which team I expect to win more games in 2011. But that bet cannot rationally exist, because nobody in his right mind would take the Broncos side of the bet. In order to ensure a properly functioning bet market, the odds and payouts must be equitable enough to draw in bettors to each side. Sports books and casinos would be out of business pretty quickly if they allowed people to make unlimited bets on the Patriots to win more games than the Broncos.

Now, maybe you still decided to take the Patriots in the last version of this bet. That might be a perfectly rational decision if you are aware of the downside risk and if your expectations placed your base case outcome somewhere in the white area of the chart. But you'd better be right. Your upside is naturally limited by the nature of the payout structure, there are far more possible negative outcome combinations, and your downside loss potential is much higher than on the Broncos side of the bet.

There are some important psychological reasons why you might be tempted to pick the Patriots. You won't have to explain to friends why on earth you would have picked the Broncos to outperform the Patriots in a contest. As each week passes with another Patriots win and another Broncos loss, you probably will feel better and better about your selection. It just feels better to bet on a winner, doesn't it? But these behavioral traps can prevent you from making the correct decision based on your expectations and the outcome distribution.

Our primary lessons drawn from this analogy, therefore, are:

- 1) *In properly functioning markets, payouts and prices are set naturally at the equilibrium point that attracts bettors/investors to each side of the bet.* Without someone to take the other side of an unfair bet, there would be no wager. Thus, the odds are altered until both sides seem similarly attractive to the casual observer.
- 2) *Probabilities and payouts matter.* While it is tempting to merely pick the more attractive of the two options without regard to payout, failure to consider what will occur if reality exceeds, matches, or falls short of expectations can have a material impact on your success.
- 3) *Insisting upon a margin of safety can reduce your downside risk and increase your expected payout.* Having no margin of safety can expose you to large losses if perfection is not attained.

If you understand and embrace these lessons, you are well on your way to becoming a fantastic investor with the patience to endure any type of environment and make rational decisions in an often irrational world. You will be equipped with the mindset necessary to improve your results, reduce your risk, and be a much calmer investor along the way. Uh oh, you say. This sounds like it's going to become a book about investing. Well, I promise to keep things lively and make you forget from time to time that we're talking about investing if you promise to take the journey with me. Deal?