

Risky Business Week 15

A Curious Decision in Baltimore

Trailing by two touchdowns late in the game against the Packers, the Ravens managed to orchestrate an impressive comeback under the direction of back-up quarterback Tyler Huntley. With 4:47 remaining in the game, the Ravens had just scored a touchdown to reduce the deficit to eight points and were facing a PAT decision. As we analyzed extensively in our Week 6 Risky Business column, it is clearly correct to attempt a two-point conversion in this situation with few exceptions. Somewhat surprisingly, Harbaugh chose to deploy the services of Justin Tucker to pull the Ravens within seven points of the Packers.

Harbaugh is one of the most analytically sound coaches in the NFL and certainly was aware of the mathematical merits of going for two in this situation. At that moment we speculated that the presence of Huntley may have been a key factor in his conservative decision. It now appeared Harbaugh would be playing for overtime if the Ravens were fortunate enough to stop the Packers on the ensuing possession and manage to score another touchdown. Well, apparently that wasn't the case.

Inexplicably, the Ravens (unsuccessfully) went for the win after scoring the second touchdown after shunning that option moments earlier. If you know you are going for the win in regulation, why wouldn't you attempt the two-point conversion at the first opportunity? With a success you can simply kick the PAT on the second touchdown for the win, and with a failure you still can go for two and possibly get into overtime. It is also worth noting the Packers still had 42 seconds and one timeout for Rodgers to move his team into field goal range. However, this scenario exists whether the Ravens tie or take the lead. There could also be an argument that the Packers will be more aggressive if trailing by one than when tied. For instance, they would attempt a long fourth down in their own territory if trailing but run out the clock if tied.

There are three separate decisions to examine:

1. Is it still correct to go for two after the first touchdown with a back-up quarterback?

As detailed in our prior analysis, even if the Ravens have only a 35% chance on the two-point conversion and are 45% to win in overtime (as our simulations suggest), it is still clearly correct to go for two.

2. If you know you are going for the win in regulation, is there any reason to not go for two after the first touchdown?

This doesn't require any math. Unless there was something Harbaugh saw on the second opportunity that wasn't present on the first one, it simply defies logic.

3 What about the independent decision to go for the win with the two-point conversion after the second touchdown?

Our custom simulations used a 13% reduction in passing DVOA and an 8% reduction in rushing DVOA for Huntley in place of Jackson. With these assumptions we show it to be a close decision with a slight lean (~2% GWC) toward kicking the PAT.

There are four key factors that must be considered for the trailing team:

1.

2PAT success rate ("P")

2.

1PAT success rate ("K")

3.

Game-winning chance at the start of overtime ("T")

4.

"Stop and Score" ("S")

1.

This is the percentage of time the Eagles can stop the Bucs from scoring on the subsequent

possession and then follow up with a touchdown.

2PAT Winning Parlay:

$(P \times S \times (K + ((1-K) \times T))) + ((1-P) \times S \times P \times T)$

1PAT Winning Parlay:

$(K \times S \times K \times T) + ((1-K) \times S \times P \times T)$

It turns out the "stop and score" only affects the magnitude of the difference but will not flip the decision regarding 1PAT vs 2PAT. Here are some comparisons of how the 2PAT success rate and overtime GWC interact with overall GWC. Values of 15% and 35% for the "Stop and Score" were used for reference and a standard assumption of 95% for the 1PAT:

2PAT Success Rate	Overtime GWC	2PAT Overall GWC	1PAT Overall GWC
35%	40%	6.5%	5.5%
	50%	6.8%	6.9%
	60%	7.2%	8.3%
45%	40%	8.0%	5.6%
	50%	8.4%	6.9%
	60%	8.8%	8.3%
55%	40%	9.5%	5.6%
	50%	9.9%	7.0%
	60%	10.3%	8.4%
65%	40%	10.8%	5.6%
	50%	11.2%	7.0%
	60%	11.6%	8.4%

*Assuming 15% "stop and score" and 95% 1 PAT success

2PAT Success Rate	Overtime GWC	2PAT Overall GWC	1PAT Overall GWC
35%	40%	15.1%	12.9%
	50%	15.9%	16.1%
	60%	16.8%	19.3%
45%	40%	18.7%	13.0%
	50%	19.7%	16.2%
	60%	20.6%	19.4%
55%	40%	22.1%	13.0%
	50%	23.1%	16.3%
	60%	24.1%	19.5%
65%	40%	25.3%	13.1%
	50%	26.2%	16.4%
	60%	27.1%	19.6%

*Assuming 35% "stop and score" and 95% 1PAT success