

# Expected Net Points | Different Methods

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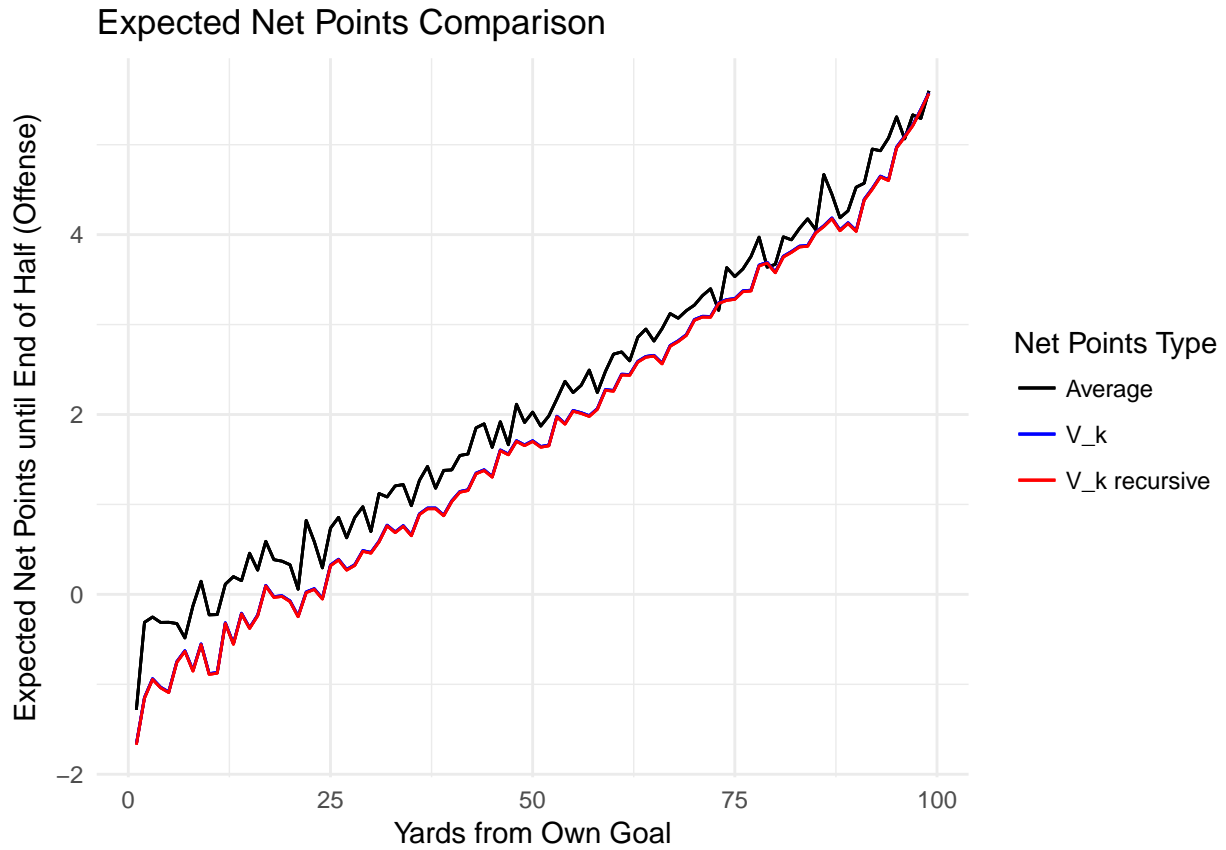
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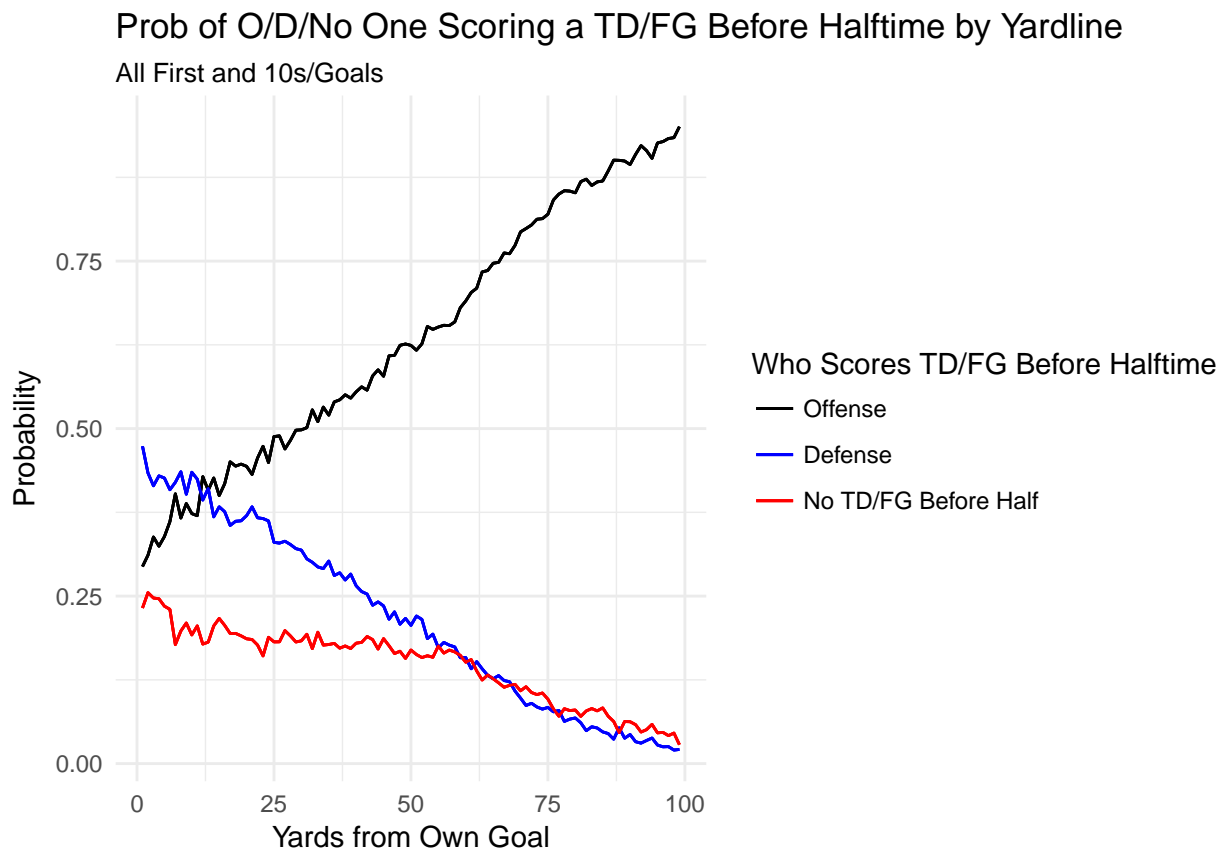
## Scalar Variables Table

Variable	Value
$P(O \parallel KO \text{ 1stDown})$	0.4740599
$P(D \parallel KO \text{ 1stDown})$	0.347779
$(ExpPTS_O \parallel O, KO)$	5.4574732
$(ExpPTS_O \parallel D, KO)$	-5.4283255
$(ExpPTS_O \parallel No \text{ TD/FG}, KO)$	0.003102
$V_k$	0.6124301
$V_k^{rec}$	0.621394

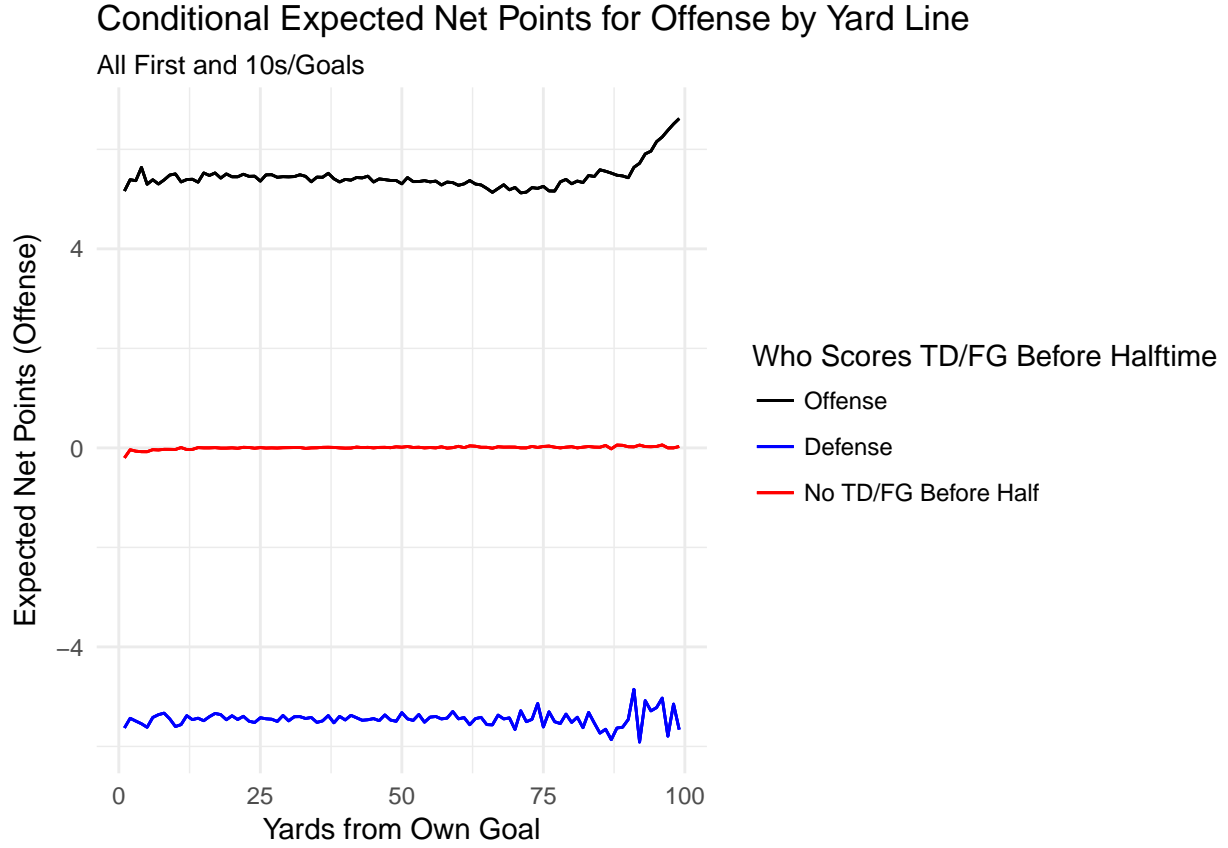
## Expected Net Points Until End of Half



## Probability of Offense/Defense/No One Scoring a TD/FG Before Halftime by Yardline



## Expected Net Points Conditional



## Appendix: Variable Construction Formulas

$$V_k^{rec} = \frac{Prob(O | KO) * ExpPTS_O + Prob(D | KO) * (-ExpPTS_O) + [1 - Prob(O | KO) - Prob(D | KO)] * ExpNetPTS}{1 + Prob(O | KO) - Prob(D | KO)}$$

$$ENP(yrdline = x) = Prob(O | yrdline = x) * [(ExpNetPTS_O | O Score, yrdline = x) - V_k] - \\ Prob(D | yrdline = x) * [(-ExpPTS_O | D Score, yrdline = x) - V_k] + \\ [1 - Prob(O | yrdline = x) - Prob(D | yrdline = x)] * (ExpNetPTS_O | Not TD, Not FG, yrdline = x)$$

Similarly except replace  $V_k$  with  $V_k^{rec}$ .