

Fantasy Football Draft Strategy Simulation and Modeling

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Preface:

The goal of this project is to explore the different draft strategies in fantasy football and see how they affect league outcomes.

Methodology:

In order to explore the effect that various draft strategies can have on the performance of a fantasy football league, I created a model that simulated 100,000 fantasy football drafts over the past 5 NFL seasons (2018 - 2022) and then converted each unique draft into its own fantasy football league to evaluate performance. Each draft was in the standard snake draft format where teams select in one set order during the odd rounds and the reverse order in the even rounds. Additionally, each league consisted of 12 teams, had 0.5 PPR scoring, and rosters consisted of 1 QB, 2 RB, 2 WRs, 1 TE, 1 FLEX, 1 DST, 1 K, and 7 bench slots.

In order to simulate each individual draft, the historical ADP data for the NFL season in which that specific draft was taking place was used. When a team was on the clock, a probability distribution weighted towards picking players with earlier ADPs as well as that team's positional needs was used to simulate the picks. This allowed this simulated draft to act as a representation of what a possible real-life fantasy football draft that could have taken place during that NFL season because it reflected the tendency for team managers to select the players available with earlier ADPs, but with random variance to reflect the event where managers reach on other players that they like better. There were also measures involved to ensure that each team would select all necessary positions.

After each league's draft was completed, the league's season would be simulated using that NFL season's real NFL statistics. Using each NFL player's game-by-game fantasy scores for that year and using a Best Ball type of scoring system, each roster's total fantasy points scored for the year (Weeks 1 - 17) were calculated. The Best Ball type of scoring system meant that each week, every player on a team's roster would score however many fantasy points they scored in real life during that week and then each fantasy team's ideal roster would be used for that week's scoring. So, for the leagues with 1 QB, 2 RBs, 2 WRs, 1 TE, 1 FLEX, 1 DST, and 1 K, the team's highest scoring QB, two highest scoring RBs, 2 highest scoring WRs, highest scoring TE, next highest scoring RB/WR/TE that was not used yet, highest scoring DST, and highest scoring K that week would be started. The points for all the starters are summed up and that would be the points scored by that team for that week of the fantasy football season. Then each week's scores would be summed up to find the total points scored for each team in the league. This type of scoring system was used in order to eliminate the randomness of start/sit decisions, waivers, trades, etc. that happen in fantasy football that would take away from evaluating the performance of the draft by each team, directly. However, since drafting kickers

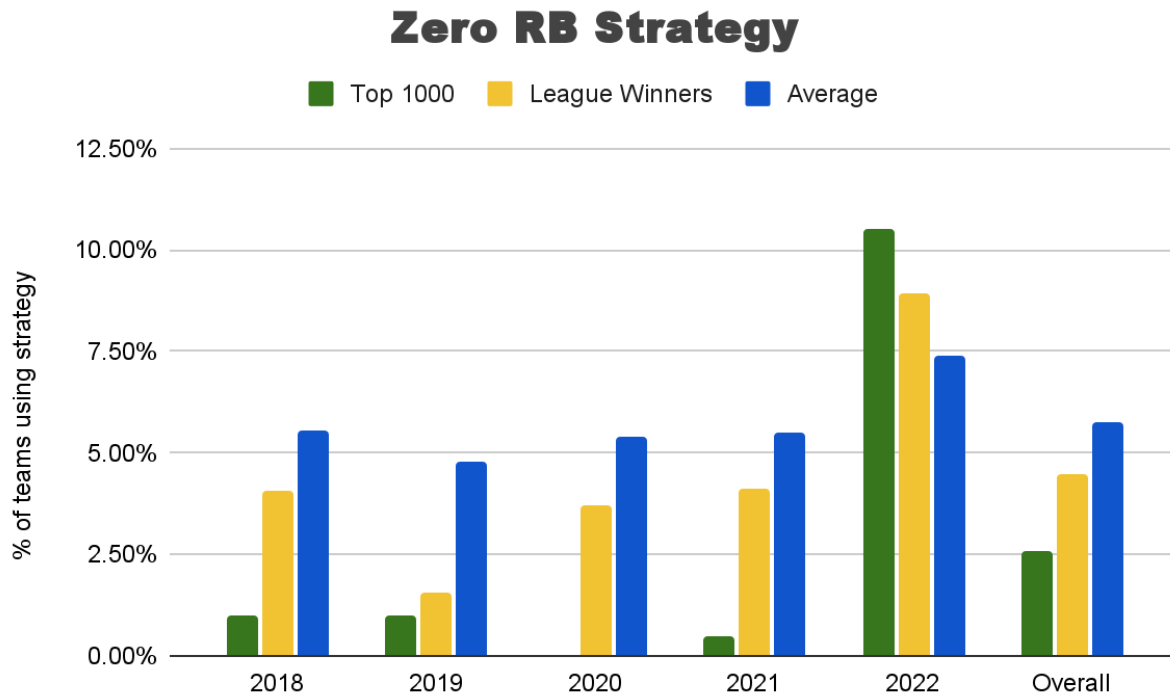
and defenses are not typically a huge part of fantasy football drafts and team managers usually resort to “streaming” these positions throughout the season, we gave the option for teams to “stream” a defense and/or kicker for the week or use their drafted defense and/or kicker. At the end, the team with the most points scored during the fantasy football season would be crowned the winning team of that fantasy football league.

Since we simulated 100,000 drafts/leagues, that meant that we had 100,000 winning teams from all of the leagues as well. To find the best draft strategies, we could then dive into the metrics behind the drafts of these 100,000 winning teams and compare them to the average metrics of all of the teams throughout the drafts. We also separately extracted the metrics of the top 1,000 highest scoring teams among the 100,000 league winning teams to find the metrics of the best of the best teams and to explore the teams that would potentially win big on Best Ball tournaments with huge prizes for the top teams, such as Best Ball Mania on underdogfantasy.com. These teams are the top 1% of all league winning teams and the top 0.0083% of teams overall.

Draft Strategies:

In our simulations, there are a few draft strategies that we explored. These strategies include, Zero RB, Zero WR, Hero RB, Early Round QB, Mid Round QB, Late Round QB, Early Round TE, Mid Round TE, and Late Round TE. In addition to these named strategies, we looked at the different combinations of positions picked by a team through the first two rounds of the draft (i.e. RB and RB, RB and WR, WR and WR, WR and TE, etc.). Each one of these strategies are explained and charted below to show the effectiveness and prevalence of these strategies. For each strategy we can compare the percentage of time this strategy was used by a league winning team vs the percentage of time this strategy was used overall by any team to see the effect this strategy has on the chance of a team winning their league. We can also look at the percentage of time this strategy was used by one of the top 1,000 teams to see the effect this strategy has on a team’s potential of becoming one of the top teams in that fantasy football season.

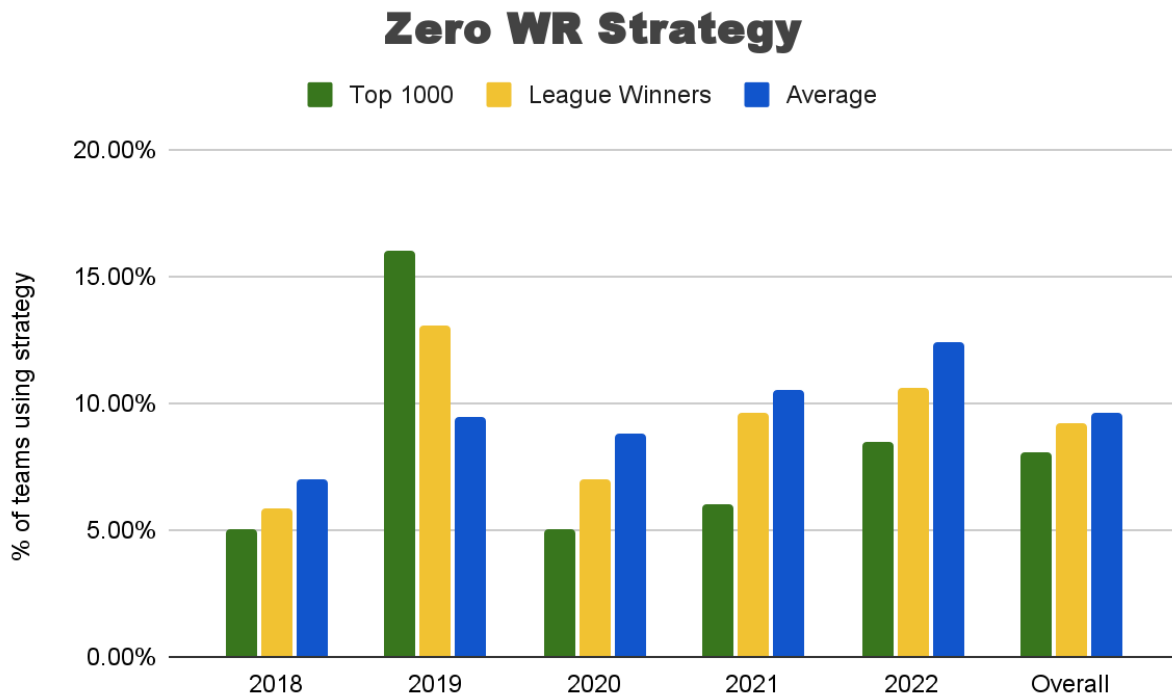
Zero RB:



The Zero RB strategy was defined as not taking a RB through the first 4 rounds of the draft. As seen in the chart above in every year except 2022, this strategy was disadvantageous as both the league winning teams and top 1,000 teams were less likely to use this strategy in comparison with the average team. The same was true for the last 5 NFL seasons overall, as 5.74% of all teams used the Zero RB strategy, but only 4.49% of winning teams used it, and only 2.6% of the top 1,000 teams used it.

Extrapolating these numbers, we find that this means that a team's chance of winning its league goes down by 1.82% from 8.33% to 6.51% and chance of being a top 1000 team goes down by 0.0045% from 0.0083% to 0.0038% by using the Zero RB strategy.

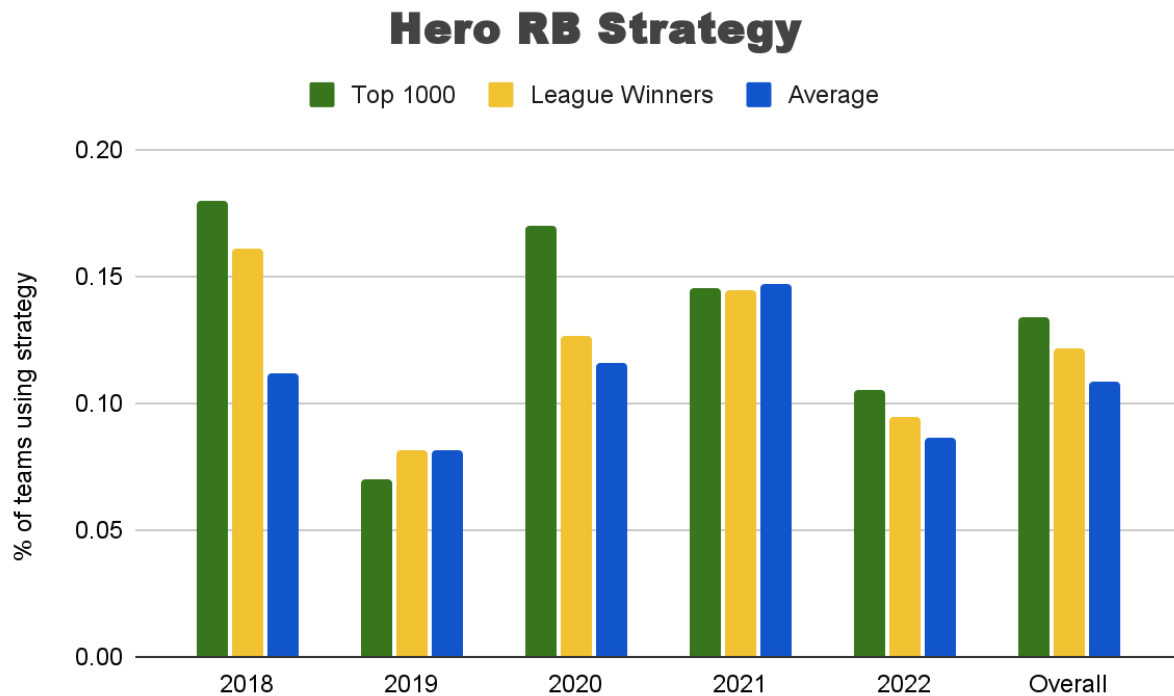
Zero WR:



Much like the Zero RB strategy, the Zero WR strategy is defined as not drafting a WR through the first 4 rounds. It also was generally unfavorable, as in every year except 2019, less of the league winning and top teams used this strategy compared to average.

However, although this strategy was still disadvantageous, it was not as bad as the Zero RB strategy as there was only a decrease of 0.36% chance of winning your league from 8.33% to 7.97% and a decrease of 0.0013% from 0.0083% to 0.0070% of being a top 1,000 team using this strategy.

Hero RB:

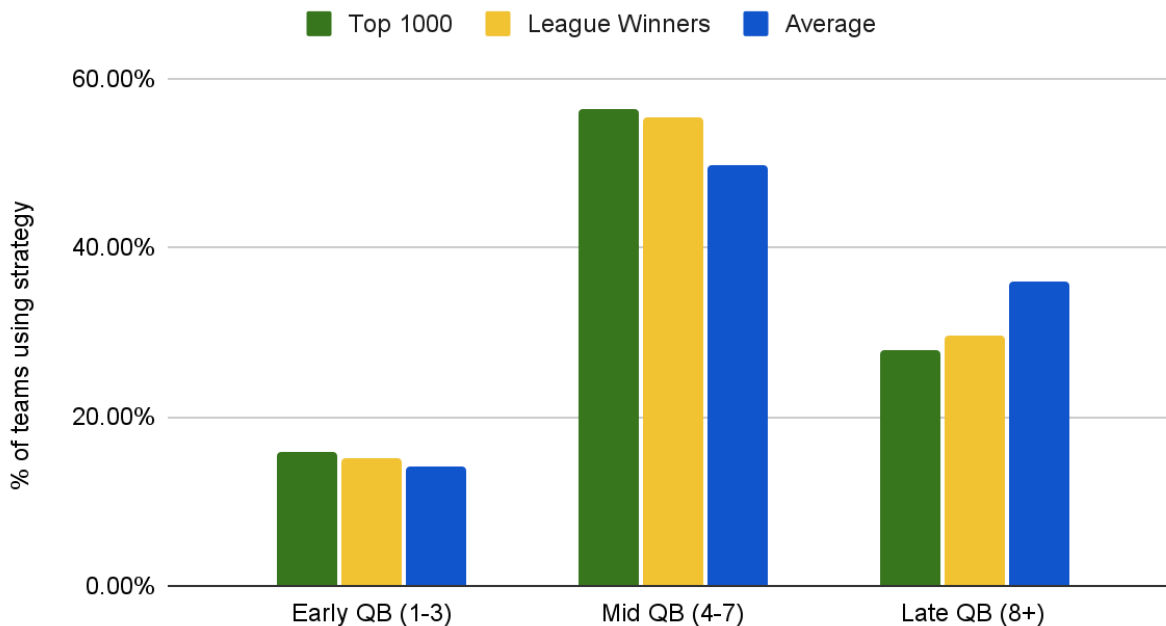


The Hero RB strategy is defined as taking a RB in round 1 and then not taking your second RB until round 6 or later. Unlike the previous two strategies, the Hero RB strategy was generally favorable as it increased a team's chances of winning in three out of the last five years and on average over the last five years.

By adopting this strategy a team's chances of winning its league increase by 0.98% from 8.33% to 9.31% and chances of being a top 1,000 team increase by 0.002% from 0.0083% to 0.0103% over the last 5 years.

QB Round Strategy:

QB Round Strategy (average last 5 years)



The round ranges where the green and/or yellow bars are higher than the blue bar are good and the round ranges where the green and/or yellow bars are lower than the blue bar are bad.

As seen in the chart, for the QB Round strategy, the early round QB strategy is defined as the first QB on the team being taken in rounds 1 through 3, the mid round QB strategy is the first QB being taken in round 4 to 7, and the late QB strategy is the first QB being taken rounds 8 or later. The chart shows the percentage of teams using each strategy averaged over the last 5 NFL seasons. As seen above, it is generally better to take an early or mid round QB as opposed to a late QB in rounds 8 or later.

By taking a QB in rounds 1-3, a team's chances of winning its league increase by 0.48% from 8.33% to 8.81%, and a team's chances of being a top 1,000 team increase by 0.0009% from 0.0083% to 0.0092%.

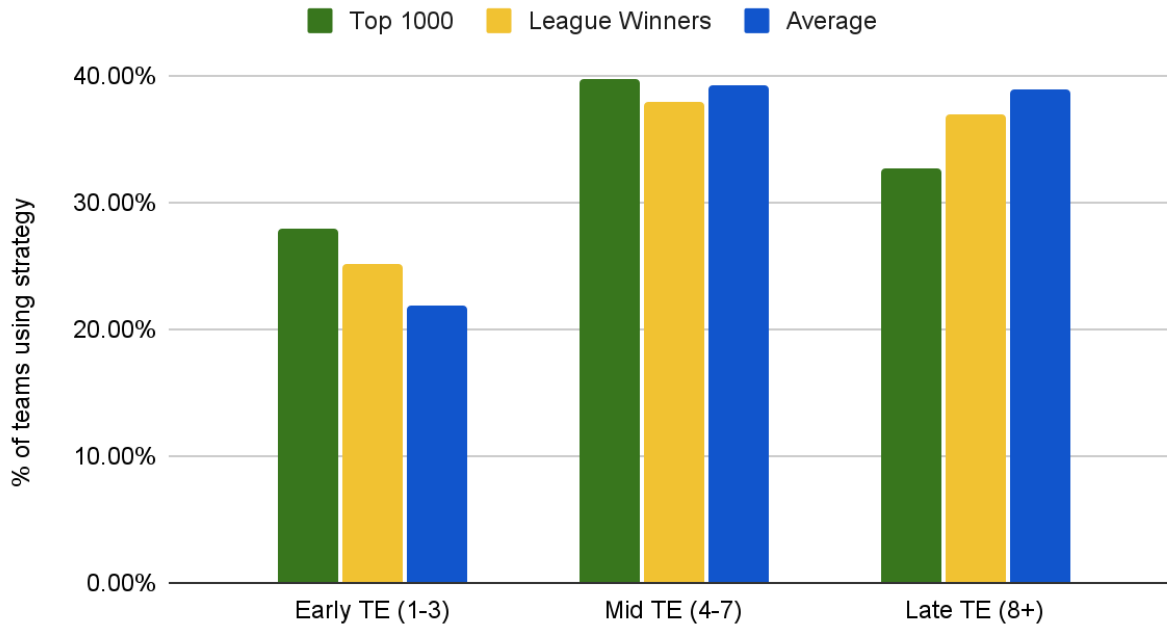
By taking a QB in round 4-7, a team's chances of winning its league increase by 0.94% from 8.33% to 9.27%, and a team's chances of being a top 1,000 team increase by 0.0012% from 0.0083% to 0.0095%.

By taking a QB in rounds 8 or later, a team's chances of winning its league decrease by 1.48% from 8.33% to 6.85%, and a team's chances of being a top 1,000 team decrease by 0.0019% from 0.0083% to 0.0064%.

Therefore, the best strategy for selecting the first QB on a team's roster is to select them in rounds 4-7, then rounds 1-3, and then rounds 8 or later.

TE Round Strategy:

TE Round Strategy (average last 5 years)



The round ranges where the green and/or yellow bars are higher than the blue bar are good and the round ranges where the green and/or yellow bars are lower than the blue bar are bad.

Just like in the QB Round strategy, the Early TE strategy is defined as taking a team's first TE in rounds 1 to 3, the Mid TE strategy is defined as taking a team's first TE in rounds 4 to 7, and the late TE strategy is defined as taking a team's first TE in round 8 or later. The chart is also averaged over the last 5 NFL seasons. The chart shows that selecting a TE early increases the chance of a team performing well, whereas selecting a TE in the middle rounds has little significance, and selecting a TE late is usually detrimental.

By taking a TE in rounds 1-3, a team's chances of winning its league increase by 1.26% from 8.33% to 9.59%, and a team's chances of being a top 1,000 team increase by 0.0023% from 0.0083% to 0.0106%.

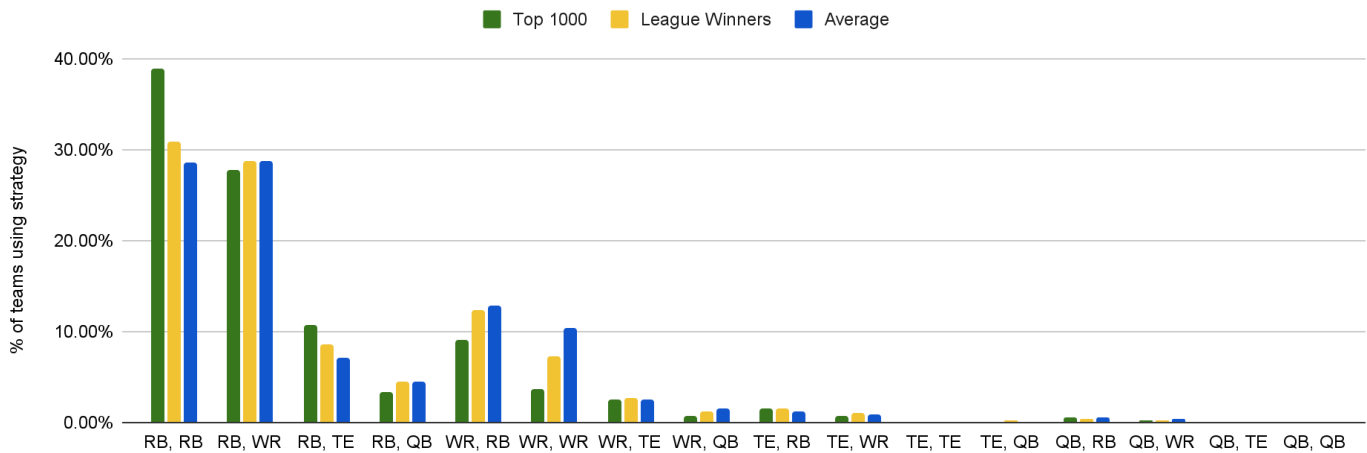
By taking a TE in round 4-7, a team's chances of winning its league decrease by 0.26% from 8.33% to 8.07%, but a team's chances of being a top 1,000 team increase by 0.001% from 0.0083% to 0.0084%.

By taking a TE in rounds 8 or later, a team's chances of winning its league decrease by 0.44% from 8.33% to 7.89%, and a team's chances of being a top 1,000 team decrease by 0.0013% from 0.0083% to 0.0070%.

Therefore, the best strategy for selecting the first TE on a team's roster is to select them in rounds 1-3, then rounds 4-7, and then rounds 8 or later.

First Two Rounds Strategy:

First 2 Rounds Strategy (average last 5 years)

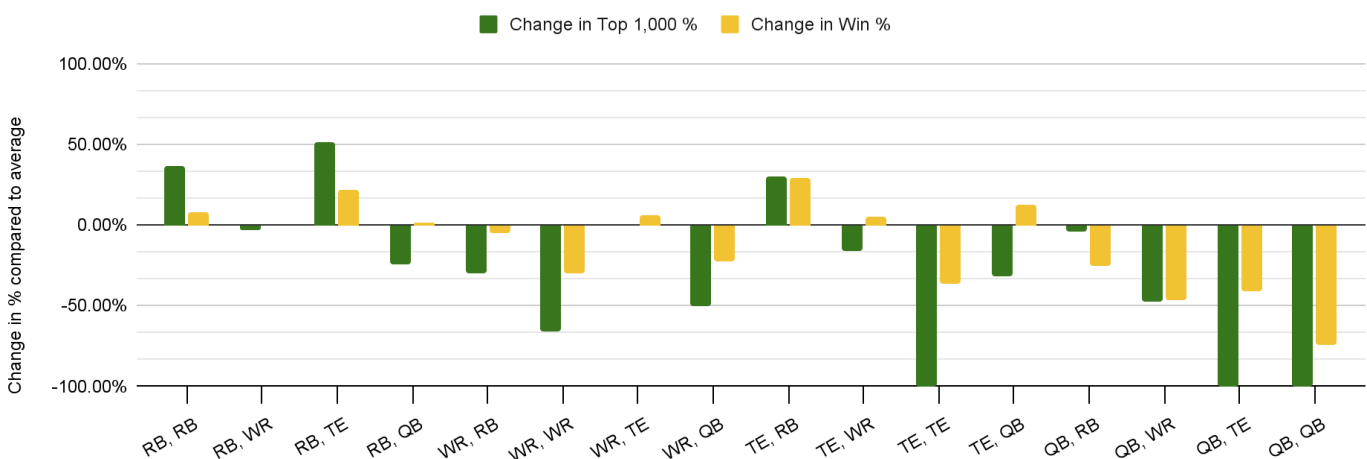


The First Two Rounds strategy looked at the positional combinations that teams drafted in the first two rounds of their draft. The chart above simply shows the percentage of teams using each individual positional combination, but does not give a great representation of which combinations are the best.

The chart below gives a better representation of which positional combinations are an advantage and which are a disadvantage to use in drafts. The green bars show an increase/decrease in the percentage of chance for a team to be in the top 1,000 compared to average using that positional combination. The yellow bars show an increase/decrease in the percentage of chance for a team to win their league compared to average using that positional combination. A bar being over 0.00% means that that specific positional combination gives the team a better chance compared to average and a bar below 0.00% means that that specific positional combination gives the team a worse chance compared to average.

As seen in the chart below, the positional combinations that give a distinct advantage are 1st round RB and 2nd round RB, 1st round RB and 2nd round TE, and 1st round TE and 2nd round RB. The combinations that do not make much of a difference include 1st round RB and second round WR, first round WR and second round TE, and first round TE and second round QB. The rest of the positional combinations provide a disadvantage in comparison to average.

First 2 Rounds Strategy (average last 5 years)



Statistical Significance:

Using a p-value of 5%, any time a draft strategy increases the chances of winning a league to about 8.48% or to below 8.19% are considered statistically significant.

In the data presented, all of the Zero RB, Zero WR, and Hero RB strategies, and the effects of selecting QBs and TEs early, middle, or late meet this threshold of being statistically significant.

Summary:

Through exploring different draft strategies we found that both the Zero RB and Zero WR are disadvantageous compared to average. Using the Zero RB strategy decreased a team's chances of winning their league by 1.82% and using the Zero WR strategy decreased a team's chances of winning their league by 0.36%.

On the other hand, using the Hero RB strategy was advantageous as using this strategy increased a team's chances of winning its league by 0.98%.

Moving on to QBs, we found that drafting a QB in the middle rounds (rounds 4-7) was the best, then drafting a QB in the early rounds (rounds 1-3) is next best, and to try to avoid drafting a QB in rounds 8 or later.

For TEs, we found that drafting a TE early (rounds 1-3) provided the biggest advantage, then drafting a TE in rounds 4-7 provided the next best option, and to, again, try to avoid drafting a first TE in rounds 8 or later.

Finally, we found that the best combination for picks in the first two rounds of the draft is RB, TE; TE, RB; or RB, RB. These combinations give a clear advantage over the rest. Drafting RB, WR; WR, TE; or TE, WR are the next best options as they do not give a clear advantage or disadvantage. The rest of the combinations, however, are a disadvantage.