# An Analysis of the Game Economy at $0.50/$1 NLH

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**Task 1a.**

A progressive rakeback system was implemented using conditionals in excel. It was most convenient to evaluate each component and then add them together. The total rakeback accumulated per player corresponds to the 'Cumulative' column in the Task 1a spreadsheet. Each component column for the progressive system is highlighted in salmon.

Test metrics are highlighted in blue. Player win rates were the main criteria to judge results. A win rate was defined as big blinds won/lost per 100 hands. Win rates were considered before and after rakeback effects. These values can be observed in the 'bb/100' and '(bb+rb)/100' columns, respectively. The relative impact of each rakeback system was evaluated by considering the effective increase in a player's win rate after rakeback. These values can be found under the 'RB Effect' column.

An effective increase in player win rates of ~17% was observed over the entire dataset after rakeback (please see Avg RB Effect). This result comes at a cost of ~20% of the total rake generated. The criteria for task 1b improves on this result and the focus of task 2 involves an evaluation of the current game state on a more micro level.

**Task 1b.**

The criteria for this rakeback system should improve on the effective increase in player win rates generated by the progressive criteria and ideally maintain revenue neutrality. However, to accomplish these goals, a better understanding of the player base is required. A breakdown of the player base is provided in the Task 2 section, but this is the key point: the average rake paid per player for this year was ~$358.

Each player on average would need to log more than 150% of their current volume to realize the next tier of rakeback in a progressive system. This does not appear to be a realistic option and hardly much of an incentive to play for players in this sample. Filtering the sample based on results, winning players averaged ~$752 in rake paid while losing players averaged ~$224. Even winning players failed on average to reach the $1,000 threshold for the next tier of rakeback.

A potential adjustment to the threshold levels of rakeback status could provide stronger incentive for players to play more hands. However, this option would not satisfy the standard of revenue neutrality. It turns out, the best option for this dataset is a flat rate of 20%. At first glance, this may seem at odds with the intention of a rakeback program but a deeper dive into the data should provide the necessary justification. An effective increase in player win rates of ~28% was observed after rakeback at an equal cost of 20% of total rake.

**Task 2.**

Exploring the player base at $.50/$1 highlights the extreme variability across most of the features in the dataset. Table 1 provides an overview of the descriptive statistics for the relevant features and associated metrics. RB Effect denotes the rakeback effect of the flat rate system. Massive outliers in both directions could be affecting some of the descriptive statistics, such as the lowest BB/100 and highest RB Effect.

**Table 1**

| | Hands | Result | Rake Paid | BB/100 | RB Effect |
|---|---|---|---|---|---|
| Mean | 5180 | -$196.55 | $358.83 | -24.20 | 0.28 |
| Std. Dev. | 20551 | -$795.22 | $1303.80 | 43.47 | 1.04 |
| Minimum | 295 | -$5888.73 | $7.83 | -277.46 | 0.01 |
| 50% | 712 | -$158.09 | $75.81 | -18.20 | 0.07 |
| Maximum | 298644 | -$7424.76 | $17668.05 | 118.39 | 20.83 |

Interestingly, the average win rate for players is -24.20. This is strongly negative and a potential explanation why most players can't meet the rakeback thresholds – they lose their money too fast. In fact, losing players outnumber winning players by a factor of almost three to one in the player base at 746 to 254, respectively.

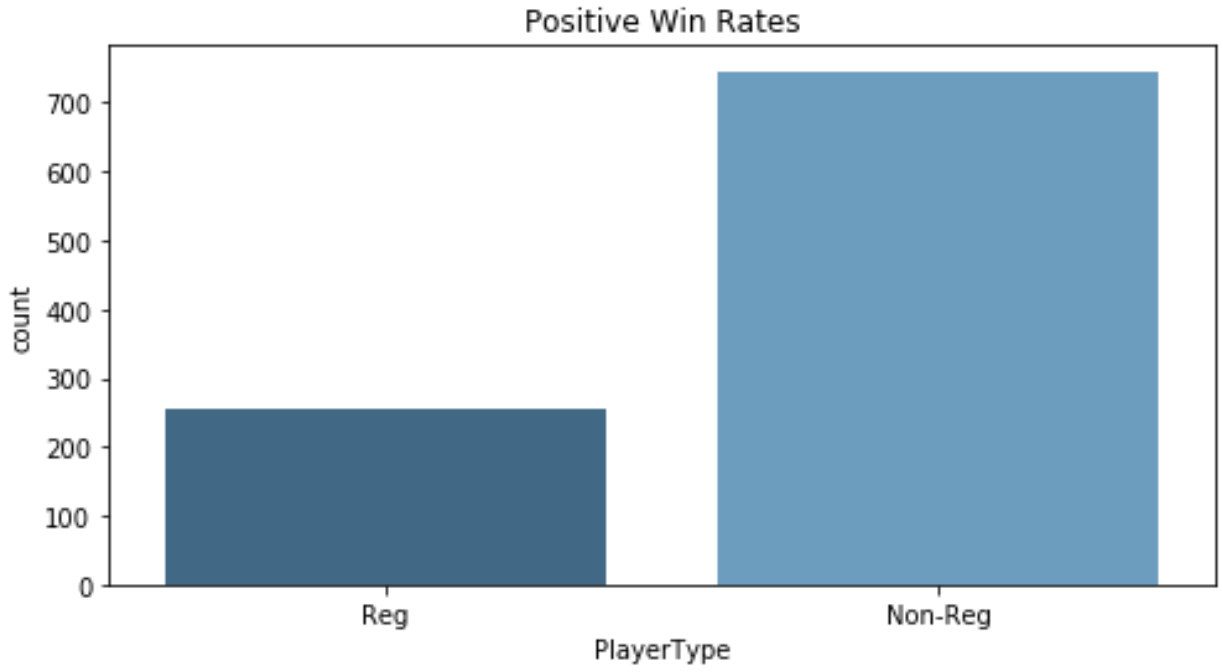


**Figure 1**

Furthermore, winning players account for over half of the total hands played and rake paid, despite only 25% representation in the sample. Figure 2 provides a visualization of this correlation between win rate and volume/rake. As mentioned previously, winning players account almost three times as much rake paid as losing players and average a yearly volume of hands played at 11,407. Losing players averaged just below 3,000 hands on the year.

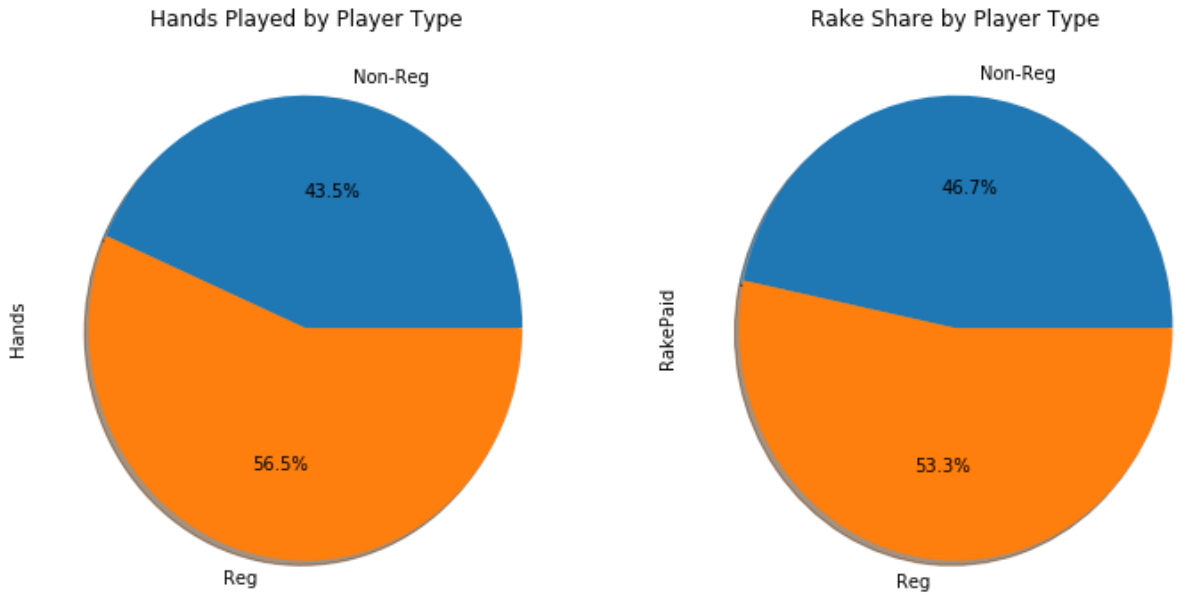


**Figure 2**

It appears the game state is such that non-regulars lose too quickly to justify a progressive criterion for distributing rakeback, as they stand to gain very little due to the high thresholds. It should be expected that a flat rate system will boost the floor of losing players win rates with some reduction in the win rates of the best players.

To determine if this holds true the player base was divided evenly according to the distribution of hands played. Each category was given a label with ‘Bronze’ representing the lowest volume group and ‘Supernova Elite’ representing the highest volume group. Hence, about 143 players belong to each group as evidenced by figure 3.

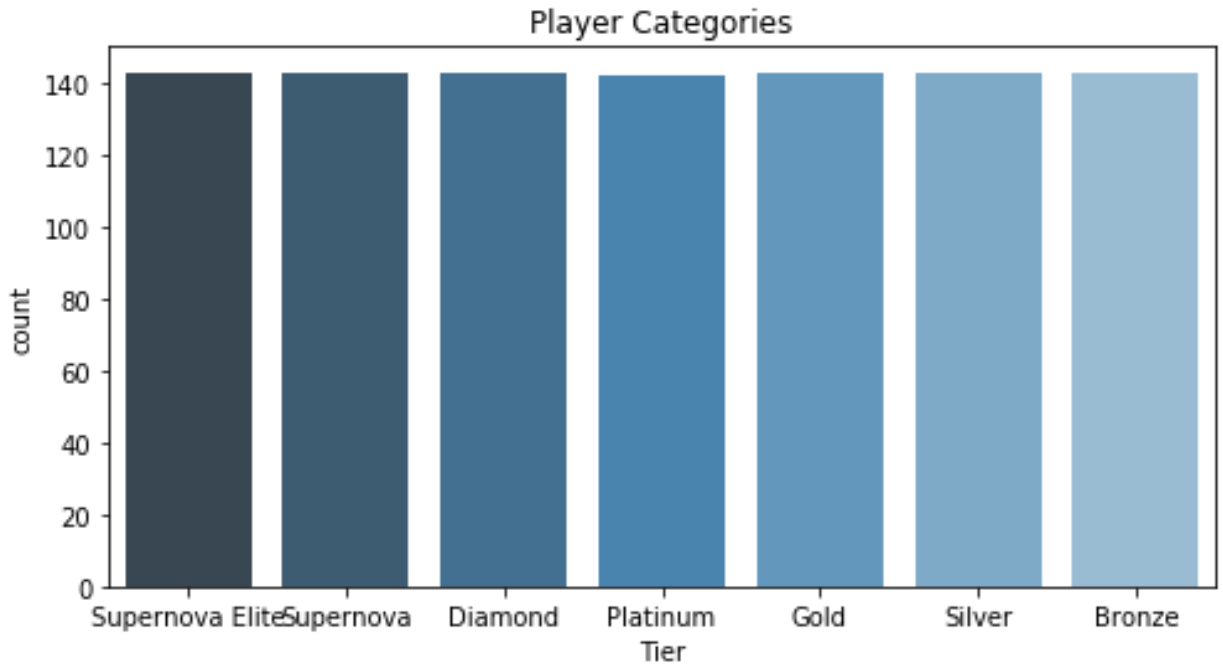


**Figure 3**

For perspective, ‘Supernova Elite’ represents the range of hands played from 3640-298644, while ‘Platinum’ and below is under 1,000 hands. Figure 4 provides the average hands played for each group.

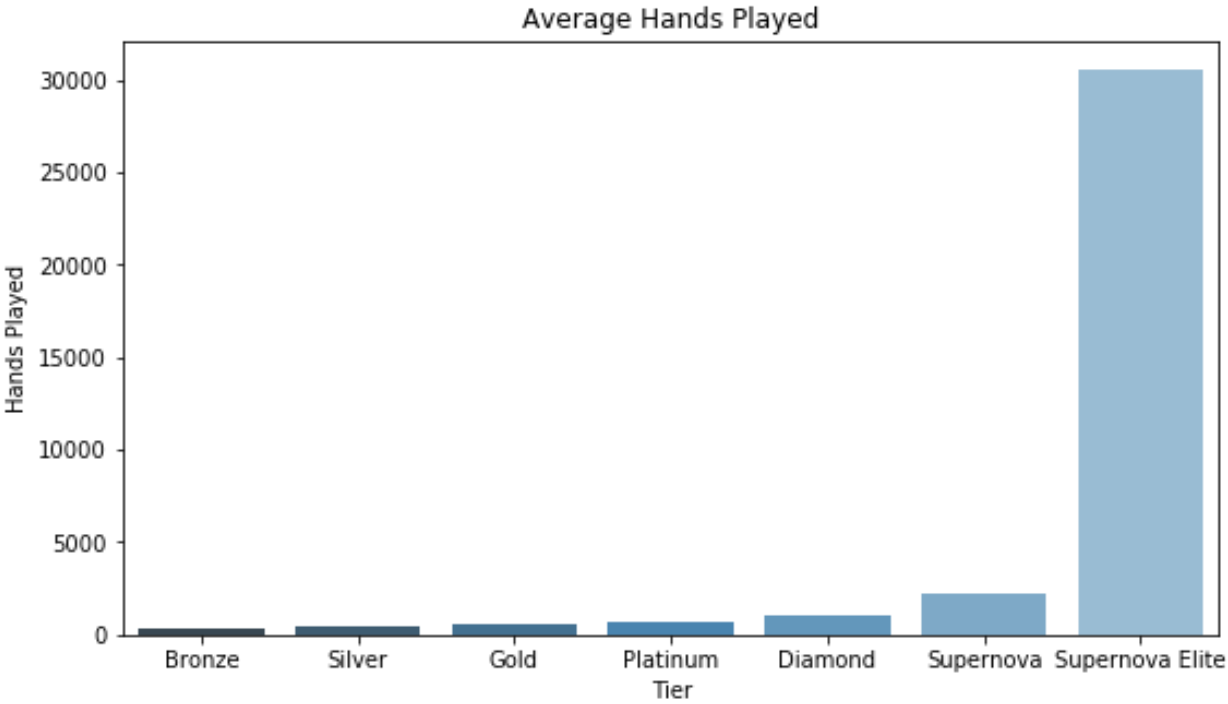


**Figure 4**

Figure 5 presents the average win rates before rakeback across each group. Surprisingly, each group has a negative average win rate but a positive trend with an increase in volume.

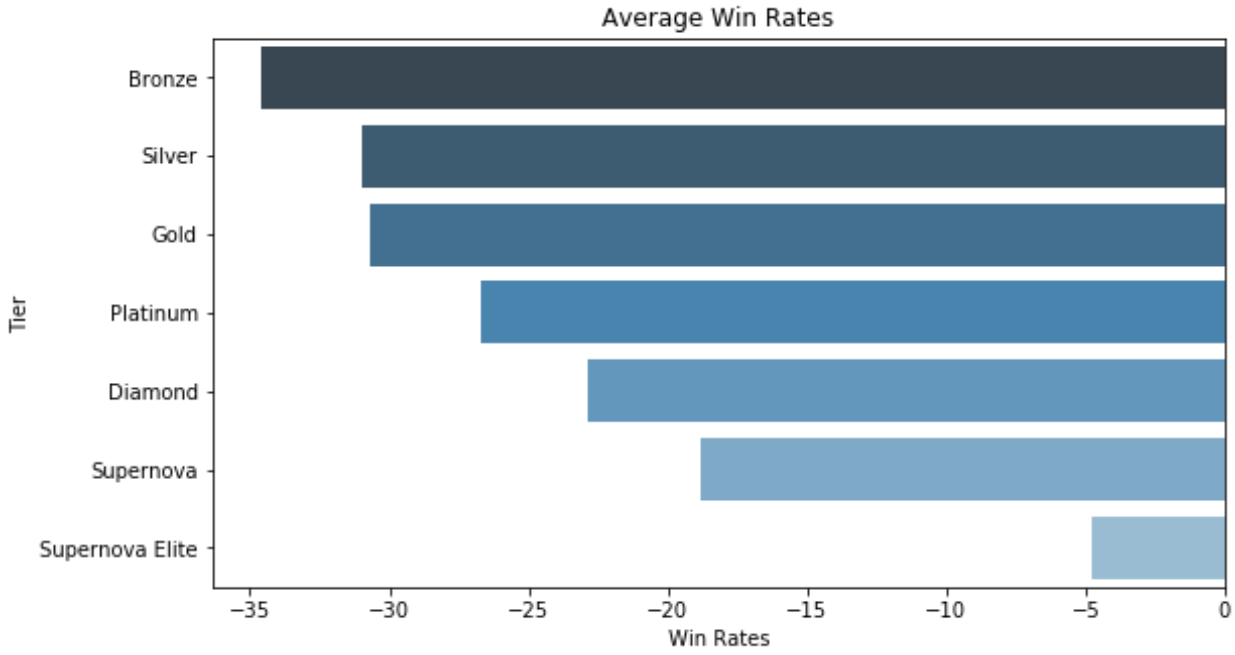


**Figure 5**

The number of winning players is consistent across each group except for ‘Supernova Elite’, which signals a strong correlation between hands played and results in the current game economy. As a result, the number of losing players is also consistent across groups except for ‘Supernova Elite’. Figure 6 provides this visual display.

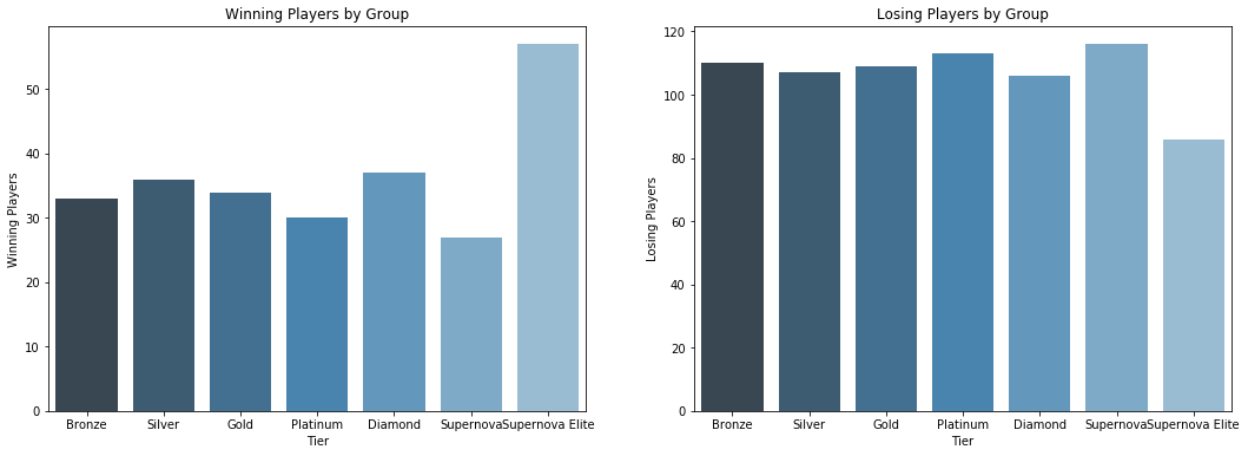


**Figure 6**

From task 1b, both criteria for a rakeback system were evaluated with respect to cost and performance. A flat rate performed better at an equal cost over the entire player base. Both criteria were also tested on each player category for performance.  Figure 7 has the results.

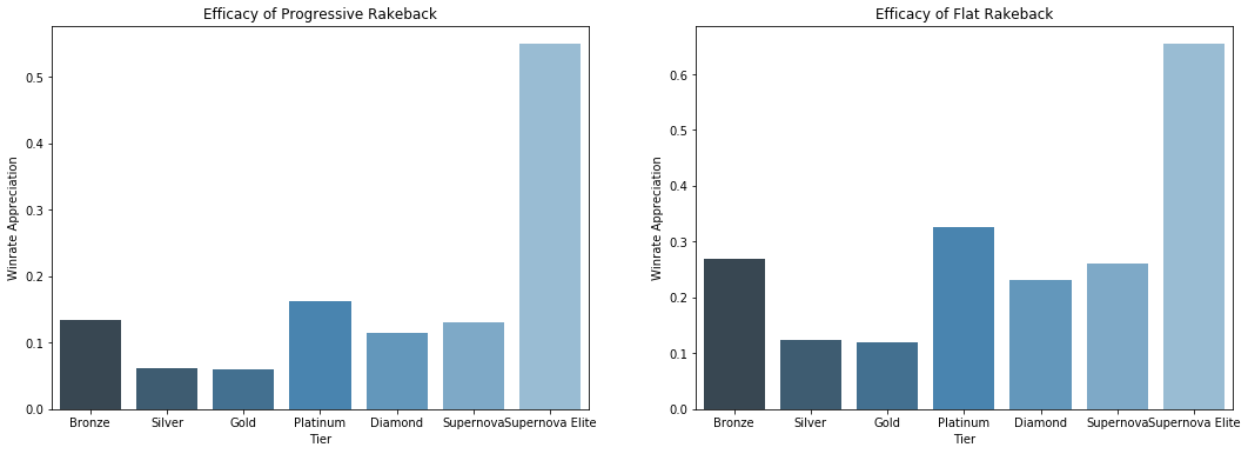


**Figure 7**

It turns out that a flat rate of 20% increased win rates across all categories relative to a progressive rate, nearly doubling each category except for ‘Supernova Elite’. As a result, this analysis suggests a flat rate of 20% for distributing rakeback would yield the best expected outcome relative to a progressive rate.

Thank you for your time.