I. Abstract

This study uses a logit model to analyze the factors affecting the probability that an NFL head coach will be fired. Our dataset is composed of fifty, randomly selected head coaches from the years 2004 to 2014. Explanatory variables include career experience, tenure, the previous year’s winning percentage, career playoff wins, whether or not the coach was in the playoffs the prior year, and race. The previous year’s winning percentage was found to significantly affect the probability a coach would be fired. The model’s correct prediction rate is 80%.

II. Empirical Model and Variables

\[
FIREDit = \frac{\exp(\alpha + \beta EXPit + \gamma TENUREit + \delta WIN100it + \theta PLAYOFFWINSit + \phi INPLAYOFFSit + \zeta RACEit)}{1 + \exp(\alpha + \beta EXPit + \gamma TENUREit + \delta WIN100it + \theta PLAYOFFWINSit + \phi INPLAYOFFSit + \zeta RACEit)}
\]

- \(FIREDit\): Whether or not the head coach was fired. 1 if fired, 0 if not fired
- \(EXPit\): How many years the coach has been a head coach in the NFL
- \(TENUREit\): How many years the coach has been with the team they are currently coaching
- \(WIN100it\): The ratio of wins to total games played in the previous year (multiplied by 100 to be represented as a percentage)
- \(PLAYOFFWINSit\): How many playoff wins a coach has in his career
- \(INPLAYOFFSit\): Dummy variable: whether or not a coach was in the playoffs the previous year. 1 if coach was in the playoffs, 0 if not
- \(RACEit\): Dummy variable for whether or not a coach is African American or not. 1 if coach is African American, 0 if other

III. Theory and Hypotheses

- \(EXPit\) is hypothesized to have a negative relationship with \(FIREDit\). As NFL experience increases, the probability of being fired should decrease
- \(TENUREit\) is hypothesized to have a negative relationship with \(FIREDit\). As tenure increases, the probability of being fired should decrease. \(WIN100it\) is hypothesized to have a negative relationship with \(FIREDit\). As the winning percentage increases, the probability of being fired should decrease
- \(PLAYOFFWINSit\) is hypothesized to have a negative relationship with \(FIREDit\). If the number of playoff wins increases, the probability of being fired should decrease
- \(INPLAYOFFSit\) is hypothesized to have a positive relationship with \(FIREDit\). History and supporting literature suggests that if a coach is African-American, the probability of being fired will increase
- \(RACEit\) is hypothesized to have a positive relationship with \(FIREDit\). History and supporting literature suggests that if a coach is African-American, the probability of being fired will increase

IV. Data

- \(N=50\) coaches (13 fired, 37 not fired)
  - To randomize sample, I alphabetized all 32 NFL teams and gave them corresponding numbers from 1-32. Using a random number generator to generate 5 random numbers for each year (2004-2014), I then found the team and corresponding coach for that year
  - Sources:
    - Data Collection: pro-football-reference.com and thehuddle.com
    - Literature: Journal of Sports Economics and Managerial Decision Economics

V. Empirical Results

| Variable | Coefficient | Standard Error | z-Value | Pr(>|z|) |
|----------|-------------|----------------|---------|----------|
| EXPit     | -0.006      | 0.002          | -4.33   | 0.000    |
| TENUREit  | -0.0005     | 0.0003         | -1.52   | 0.128    |
| WIN100it  | -0.01       | 0.004          | -3.04   | 0.002    |
| PLAYOFFWINSit | -0.04 | 0.006 | -7.14 | 0.000 |
| INPLAYOFFSit | 0.005 | 0.003 | 1.61 | 0.108 |
| RACEit   | 0.01        | 0.006          | 1.61    | 0.108    |

The coefficient for \(WIN100it\) is statistically significant and has the expected sign. 46% of the fired coaches and 90% of the non-fired coaches are predicted correctly. Results must be analyzed with caution due to small sample size

VI. Conclusion

- The model’s correct prediction rate is 80%
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