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**Derrick R. Yam\*** (dyam@skidmore.edu), 815 N. Broadway, Skidmore College, Saratoga Springs, NY 12866, and **Michael J. Lopez**. *Quantifying the causal effects of conservative fourth down decision making in the National Football League*. Preliminary report.

Historically, it has been argued that NFL coaches are too conservative in attempting fourth downs. However, many empirical approaches looking at team decision-making are confounded by extraneous factors. For example, teams that decide to "go for it" on fourth down are inherently different from those that choose other play types. In many instances, teams are obliged to go for it because they are trailing on the scoreboard. As a result, inference on how all teams should behave on fourth down has required unjustifiable extrapolations. Using a data set featuring the last 11 years of play calls, we attempt to quantify the benefits of aggressive fourth down behavior in the NFL. Utilizing tools from causal inference and a nearest neighbor matching algorithm, teams that went for it ('treatment') are paired to those who did not go for it ('control') based on their probability of going for it, defined as the propensity score. After estimating each team's win probability before and after each play based on a random forest model, we approximate the additional number of wins that NFL teams could gain by implementing a more aggressive fourth down strategy. Results better inform decision-making in a high-stakes environment where standard statistical tools are informative but, to date, limited. (Received September 20, 2016)