Does the Scouting Combine Influence a Player's Standing in the NFL Draft?

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ABSTRACT

The annual scouting combine gives National Football League (NFL) teams an opportunity to assess over four days the skills of that year's most promising college football players. The authors merge two data sets on over one thousand draft eligible football players spanning the ten-year period between 2014 and 2023 on their ultimate draft pick numbers and selected combine test results. Combine test results are converted to z-scores, that is, each participant's number of standard deviations above or below the average performance in that year's particular combine test. Wide receivers' standing in the NFL's draft correlates well with combine test results in the 40-yard dash. However, the authors find little-to-no relationship between combine test results and draft pick status over the last five years (let alone the last ten) for defensive backs, running backs, and defensive linemen who participated in, respectively, the vertical leap, broad jump, and bench press repetitions.

Introduction

Each spring, the National Football League (NFL) conducts an invitation-only four-day event known as the NFL Scouting Combine (hereafter, the combine), a series of mental and physical tests designed to assess the skills of the most elite college football players. Since 1987, this annual event (cancelled in 2021 during the coronavirus pandemic) has been held in Indianapolis. In 2023, the combine took place between March 2 and March 5; the 2023 NFL draft started April 27.

Kuzmits and Adams [1] examined the simple correlation between combine test results and various measures of NFL success (including draft order) for players drafted at quarterback, running back, and wide receiver over the period 1999 – 2004. The authors find no statistical relationship between combine test results and professional football performance, with the exception of sprint tests for running backs.

McGee and Burkett [2] examined the overall usefulness of the combine, in general, and as a predictor of draft order. The authors studied only the 326 collegiate football players attending the 2000 combine. They conclude that the combine predicted the draft status of running backs, wide receivers, and defensive backs, but was only a fair-to-good predictor for other positions.

In this short research note, we examine ten years of data (2014 – 2023) on four combine tests – the 40-yard dash, the vertical leap, the broad jump, and the bench press – and whether the respective test results explain the standing in the NFL draft of wide receivers, defensive backs, running backs, and defensive linemen.

The Data

The NFL draft consists of seven rounds (the length of the draft since 1994). Under the NFL's reverse-order-of-finish draft, the weakest teams draft first and the winner of the Super Bowl drafts last. There are typically about 224 draft

picks (seven rounds, with each of 32 teams picking once per round, with some NFL teams receiving additional compensatory picks for free agents lost). For each of the last ten seasons (2014 – 2023), we recorded each football player's draft pick number from [3]. The earlier the player is drafted, the lower his draft pick number. That is, a No. 1 pick overall in the NFL draft is more desirable than the same team's second choice, a No. 33 pick.

Over the same ten-year period, we collected NFL combine results on four different physical tests: (i) 40-yard dash time in seconds [for wide receivers]; (ii) vertical leap height in inches [for defensive backs]; (iii) broad jump distance in inches [for running backs]; and
(iv) 225-pound bench press repetitions [for defensive linemen] from [4,5]. We believe that each physical test matches up well with each position's skillset. In lieu of recording a time (seconds) or distance (inches), we converted combine test results to z-scores. For example, among all wide receivers who ran the 40-yard dash, we recorded his z-score, that is, the number of standard deviations above or below the average time of all wide receivers (drafted or not) in the 40-yard dash that particular year. Ordinal rankings in combine tests do not shed any light on the degree of variation between two times. And the times alone may not be very illuminating because an excellent time in one year may be only average a few years later. Since fast (or low) times are preferred to slow (or high) times, z-scores will be negative numbers for wide receivers who run the fastest. Since higher leaps are preferred to shorter leaps, z-scores will be positive numbers for the more successful defensive backs in the vertical leap or running backs in the broad jump. Similarly, since more bench press repetitions are preferred to fewer repetitions, z-scores will again be positive numbers for the more successful defensive linemen in the bench press combine test. The authors used "pro-day data" for 2021 because there was no combine due to COVID that year. Nearly every player participated in their school's "pro-day data" that included the same skills competitions at a typical NFL combine.

Finally, the authors merged the two ten-year data files on 1065 drafted players, one containing the players' draft pick numbers and the other containing the players' NFL combine test results. This enabled us to match up any drafted player with his corresponding combine test result (z-score).

Methodology

To assess what (if any) effect the scouting combine has on a player's standing in the NFL draft, we regressed the player's draft pick number on his z-score in a particular combine test. The general form of the regression model is:

$$(1) \qquad draft\_pick\_number_{i,t} = \beta_0 + \beta_1\, z\_score_{i,t} + \beta_2\, z\_score \times D1 + \varepsilon_{i,t}$$

for drafted player *i* in year *t* where ε denotes the disturbance term. The dependent variable is the player's *draft pick number* and the independent variables are the player's *z-score* in a combine test scouts might regard as important for a player at that position (for example, the 40-yard dash for wide receivers) and the player's *z-score* interacted with a 0-1 dummy variable *D1* that is equal to "1" for the last five years (2019 through 2023); otherwise, *D1* is equal to zero. The sum of the two estimated slope coefficients, $b_1 + b_2$ (that is, the respective estimates for $\beta_1 + \beta_2$), indicates the incremental effect of a particular combine test z-score on the player's standing in the NFL draft over the last five years (2019 – 2023); b_1 alone indicates the incremental effect of a z-score in the aforementioned combine test on the player's standing in the NFL draft over the previous five-year period (six to ten years ago, namely, 2014 – 2018). For wide receivers running the 40-yard dash, we would expect b_1 and b_2 to be positive (that is, the faster their time, the more negative their z-score and the smaller their draft pick number). For defensive backs (in the vertical leap), running backs (in the broad jump), and defensive linemen (in the bench press, for which players must lift 225 pounds as many times as possible), we would expect b_1 and b_2 to be negative (that is, the higher or longer their jump or the larger their number of bench press repetitions, the more positive their z-score and the smaller their draft pick number). In instances where only b_1 is statistically discernible from zero ($\alpha = .05$), but b_2 is not, we would conclude that the combine test favorably influenced a player's standing in the NFL draft between 2014 and 2018, but not in the last five years (2019

– 2023). If the sum "$b_1 + b_2$" is statistically discernible from zero, the combine test favorably influenced a player's standing in the NFL draft over the last five years, 2019 through 2023.

The Results

In this section, we discuss the results of four different regressions: (i) the 40-yard dash for wide receivers; (ii) the vertical leap for defensive backs; (iii) the broad jump for running backs; and (iv) the bench press for defensive linemen. All four regressions relate the player's draft pick number to his z-score in a particular combine test.

Table 1. Selected Combine Test Regression Results, 2014 – 2023

Dependent variable*: draft pick number*

Combine test	Group	Constant b_0	*z-score* b_1	*z-score*D1*[a] b_2	*p*-values on b_1	*p*-values on $b_1 + b_2$
40-yard dash	wide receivers (n = 263)	134.05 (21.24)*	24.93 (5.27)	-1.99 (-0.23)	<.001	.021
vertical leap	defensive backs (n = 346)	110.29 (20.99)	-14.10 (-3.82)	19.55 (2.68)	<.001	.495
broad jump	running backs (n = 157)	130.00 (17.99)	-9.23 (-1.74)	3.91 (0.39)	.084	.654
bench press	defensive linemen (n = 299)	110.63 (19.48)	-1.71 (-0.41)	8.04 (0.98)	.682	.496

[a]D1 = 1 for the years 2019 through 2023; otherwise, D1 = 0 for the years 2014 through 2018.
*Numbers in parentheses are *t*-values.

The first regression reported in Table 1 includes 263 wide receivers drafted between 2014 and 2023. The slope coefficient on the z-score is positive and statistically significant ($p < .001$). The sum of the slope coefficients (22.94 = 24.93 – 1.99) is also statistically discernible from zero ($p = .021$). Hence, for wide receivers, faster times in the 40-yard dash significantly improved their standing in the NFL draft in not only the last five years, but over the last ten years.

The next regression in Table 1 summarizes the results of the vertical leap for 346 defensive backs drafted between 2014 and 2023. The vertical leap was statistically significant between 2014 and 2018, but not significant since

2019. That is, six to ten years ago, a strong performance in the vertical leap (that is, a large positive z-score) improved a defensive back's standing in the NFL draft, but in the last five years, it did not.

As for the other two combine tests analyzed in this paper – the broad jump for 157 running backs and bench press repetitions for 299 defensive linemen, neither combine test was associated with significantly earlier draft order selections.

Concluding Remarks

Standardized scores known as z-scores are used to determine how well various groups of invitees to the NFL's scouting combine performed and whether a good performance improved their standing in the NFL draft.

The combine test results covering a ten-year period (2014 – 2023) included drafted wide receivers (40-yard dash), defensive backs (vertical leap), running backs (broad jump), and defensive linemen (bench press repetitions). A strong performance in the 40-yard dash has helped wide receivers in the NFL draft over the last ten years. Defensive backs who performed well in the vertical leap benefited over the period 2014 – 2018, but did not benefit in the last five years. Strong performances in the broad jump or the bench press did not augur well for, respectively, running backs or defensive linemen in the NFL draft. Perhaps front offices are beginning to rely less on the combine when drafting prospects.

Fans of the game might wonder if the 40-yard dash time is a useful metric for players other than wide receivers or if the number of bench press repetitions improves the draft pick number of players other than defensive linemen. The broad jump (a test that uses lower-body strength) might be important to not only running backs but also defensive and offensive linemen. The vertical leap might be important to wide receivers. Moreover, other than matching up the four combine tests presented here with other groups of players, one could examine what (if any) effect other physical combine tests (like the three-cone drill or 20-yard shuttle) have had on a football player's order of selection in the NFL draft. Furthermore, an NFL prospect's physical performances at the combine are not the only criteria on which draft decisions are made. NFL coaches, general managers, and scouts would also be interested in a prospect's medical tests, personal interviews, and his college football stats. A weak set of combine results does not necessarily denote a weak player nor does a strong set of combine results necessarily denote a strong player. Finally, with more access to media and film, these three groups may now rely less on a skills competition at the combine and more on videos of college gameplay to determine if a player is worth drafting.

References

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