# Supplementary Tables

## 4th Downs Decoded: A Selection-Bias-Corrected Study of Player Impact on Fourth Down Conversions in the NFL

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*This document contains detailed regression tables and statistical results supporting the main analysis presented in the paper.*

Table 1: Fourth Down Conversion Model Results for Quarterbacks

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| QB 1: Deep Pass | -0.019 (0.016) | 0.023 (0.021) | -0.028 (0.018) | 0.035 (0.025) | -0.027 (0.019) | 0.032 (0.026) |
| QB 1: Medium Pass | -0.028 (0.016)* | 0.040 (0.022)* | -0.036 (0.019)* | 0.057 (0.027)** | -0.038 (0.019)* | 0.062 (0.028)** |
| QB 1: Short Pass | 0.016 (0.016) | -0.023 (0.021) | 0.023 (0.018) | -0.039 (0.027) | 0.023 (0.019) | -0.039 (0.028) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 2: Fourth Down Conversion Model Results for Running Backs

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| RB 1: Deep Route | -0.080 (0.049) | -0.010 (0.021) | -0.106 (0.059)* | -0.007 (0.025) | -0.111 (0.062)* | -0.006 (0.026) |
| RB 1: Medium Route | 0.043 (0.043) | -0.016 (0.021) | 0.059 (0.051) | -0.028 (0.025) | 0.061 (0.053) | -0.031 (0.027) |
| RB 1: Short Route | -0.030 (0.021) | 0.045 (0.022)** | -0.042 (0.024)* | 0.063 (0.026)** | -0.044 (0.025)* | 0.065 (0.027)** |
| RB 1: Pass Block | -0.009 (0.018) | 0.019 (0.023) | -0.011 (0.020) | 0.026 (0.027) | -0.013 (0.021) | 0.029 (0.028) |
| RB 1: Run Grade | 0.006 (0.023) | -0.026 (0.026) | 0.006 (0.026) | -0.034 (0.030) | 0.006 (0.027) | -0.038 (0.032) |
| RB 2: Deep Route | 0.052 (0.044) | -0.018 (0.021) | 0.061 (0.052) | -0.029 (0.025) | 0.069 (0.054) | -0.031 (0.027) |
| RB 2: Medium Route | -0.034 (0.047) | 0.014 (0.021) | -0.052 (0.055) | 0.023 (0.026) | -0.051 (0.058) | 0.027 (0.027) |
| RB 2: Short Route | -0.011 (0.027) | -0.010 (0.024) | -0.017 (0.031) | -0.015 (0.029) | -0.020 (0.033) | -0.018 (0.031) |
| RB 2: Pass Block | -0.004 (0.023) | 0.013 (0.023) | 0.001 (0.026) | 0.017 (0.027) | 0.001 (0.028) | 0.019 (0.029) |
| RB 2: Run Grade | 0.011 (0.033) | -0.000 (0.022) | 0.012 (0.038) | -0.002 (0.026) | 0.014 (0.039) | -0.001 (0.028) |
| RB 3: Deep Route | 0.011 (0.048) | -0.021 (0.022) | 0.010 (0.055) | -0.026 (0.025) | 0.008 (0.057) | -0.028 (0.026) |
| RB 3: Medium Route | 0.016 (0.051) | -0.010 (0.023) | 0.012 (0.059) | -0.009 (0.027) | 0.013 (0.061) | -0.009 (0.028) |
| RB 3: Short Route | -0.001 (0.042) | -0.030 (0.027) | 0.001 (0.049) | -0.050 (0.032) | -0.003 (0.052) | -0.052 (0.034) |
| RB 3: Pass Block | 0.051 (0.031)* | 0.015 (0.027) | 0.065 (0.035)* | 0.031 (0.032) | 0.069 (0.037)* | 0.031 (0.034) |
| RB 3: Run Grade | -0.141 (0.060)** | -0.009 (0.024) | -0.175 (0.072)** | -0.016 (0.029) | -0.185 (0.076)** | -0.016 (0.030) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 3: Fourth Down Conversion Model Results for Wide Receivers

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| WR 1: Run Block | -0.013 (0.018) | 0.054 (0.024)** | -0.016 (0.020) | 0.074 (0.028)*** | -0.014 (0.021) | 0.077 (0.029)*** |
| WR 1: Deep Route | 0.019 (0.019) | 0.003 (0.021) | 0.025 (0.022) | 0.002 (0.026) | 0.028 (0.023) | 0.003 (0.028) |
| WR 1: Medium Route | 0.032 (0.018)* | -0.042 (0.023)* | 0.044 (0.021)** | -0.055 (0.028)* | 0.046 (0.022)** | -0.058 (0.030)* |
| WR 1: Short Route | 0.008 (0.017) | 0.003 (0.022) | 0.009 (0.019) | 0.005 (0.026) | 0.009 (0.020) | 0.010 (0.028) |
| WR 2: Run Block | -0.030 (0.017)* | 0.036 (0.021)* | -0.034 (0.018)* | 0.048 (0.024)** | -0.037 (0.019)* | 0.049 (0.025)* |
| WR 2: Deep Route | 0.017 (0.020) | -0.010 (0.020) | 0.022 (0.023) | -0.014 (0.023) | 0.020 (0.024) | -0.012 (0.024) |
| WR 2: Medium Route | 0.004 (0.018) | -0.042 (0.021)** | 0.004 (0.021) | -0.059 (0.025)** | 0.002 (0.022) | -0.060 (0.027)** |
| WR 2: Short Route | -0.003 (0.017) | -0.018 (0.019) | -0.004 (0.019) | -0.026 (0.023) | -0.003 (0.020) | -0.029 (0.024) |
| WR 3: Run Block | -0.006 (0.018) | 0.022 (0.020) | 0.000 (0.021) | 0.019 (0.026) | 0.000 (0.022) | 0.021 (0.027) |
| WR 3: Deep Route | -0.024 (0.027) | -0.005 (0.021) | -0.025 (0.031) | -0.007 (0.026) | -0.030 (0.033) | -0.010 (0.028) |
| WR 3: Medium Route | -0.041 (0.028) | 0.004 (0.022) | -0.054 (0.033) | 0.002 (0.027) | -0.051 (0.034) | 0.002 (0.029) |
| WR 3: Short Route | -0.018 (0.027) | 0.030 (0.024) | -0.030 (0.032) | 0.048 (0.028)* | -0.031 (0.033) | 0.050 (0.030)* |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 4: Fourth Down Conversion Model Results for Tight Ends

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| TE 1: Pass Block | 0.026 (0.020) | -0.035 (0.021)* | 0.035 (0.024) | -0.057 (0.026)** | 0.036 (0.025) | -0.058 (0.028)** |
| TE 1: Run Block | -0.047 (0.022)** | 0.065 (0.024)*** | -0.064 (0.026)** | 0.098 (0.029)*** | -0.065 (0.027)** | 0.100 (0.030)*** |
| TE 1: Deep Route | -0.022 (0.032) | -0.002 (0.021) | -0.039 (0.038) | 0.002 (0.025) | -0.037 (0.039) | 0.001 (0.026) |
| TE 1: Medium Route | -0.016 (0.025) | -0.024 (0.021) | -0.009 (0.030) | -0.048 (0.028)* | -0.009 (0.031) | -0.051 (0.030)* |
| TE 1: Short Route | -0.013 (0.021) | -0.028 (0.023) | -0.016 (0.024) | -0.034 (0.029) | -0.017 (0.025) | -0.034 (0.031) |
| TE 2: Pass Block | 0.008 (0.022) | -0.035 (0.025) | 0.011 (0.025) | -0.043 (0.031) | 0.013 (0.026) | -0.048 (0.033) |
| TE 2: Run Block | -0.067 (0.026)** | 0.045 (0.025)* | -0.091 (0.031)*** | 0.051 (0.030)* | -0.091 (0.032)*** | 0.055 (0.032)* |
| TE 2: Deep Route | 0.004 (0.036) | -0.036 (0.022)* | 0.002 (0.042) | -0.045 (0.027)* | 0.001 (0.044) | -0.050 (0.028)* |
| TE 2: Medium Route | -0.010 (0.033) | -0.013 (0.023) | -0.011 (0.038) | -0.023 (0.029) | -0.009 (0.040) | -0.023 (0.030) |
| TE 2: Short Route | 0.006 (0.030) | 0.028 (0.024) | 0.001 (0.035) | 0.048 (0.028)* | -0.000 (0.037) | 0.049 (0.029)* |
| TE 3: Pass Block | -0.002 (0.035) | -0.011 (0.029) | -0.003 (0.039) | -0.010 (0.035) | -0.003 (0.041) | -0.014 (0.037) |
| TE 3: Run Block | 0.048 (0.071) | -0.018 (0.030) | 0.066 (0.082) | -0.025 (0.037) | 0.068 (0.086) | -0.025 (0.039) |
| TE 3: Deep Route | 0.015 (0.042) | -0.000 (0.022) | 0.014 (0.048) | -0.004 (0.027) | 0.015 (0.050) | -0.002 (0.028) |
| TE 3: Medium Route | 0.004 (0.042) | 0.014 (0.023) | 0.014 (0.049) | 0.020 (0.027) | 0.015 (0.051) | 0.022 (0.029) |
| TE 3: Short Route | -0.057 (0.041) | 0.021 (0.026) | -0.083 (0.049)* | 0.026 (0.031) | -0.084 (0.051) | 0.024 (0.033) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 5: Fourth Down Conversion Model Results for Tackles

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| T 1: Pass Block | -0.017 (0.016) | 0.015 (0.023) | -0.022 (0.018) | 0.009 (0.028) | -0.026 (0.019) | 0.013 (0.030) |
| T 1: Run Block | 0.007 (0.017) | 0.009 (0.022) | 0.004 (0.019) | 0.020 (0.027) | 0.006 (0.020) | 0.016 (0.028) |
| T 2: Pass Block | 0.016 (0.023) | -0.052 (0.028)* | 0.027 (0.027) | -0.074 (0.034)** | 0.027 (0.028) | -0.077 (0.036)** |
| T 2: Run Block | -0.044 (0.028) | 0.056 (0.029)* | -0.058 (0.033)* | 0.072 (0.035)** | -0.059 (0.034)* | 0.077 (0.037)** |
| T 3: Pass Block | 0.041 (0.033) | -0.040 (0.033) | 0.047 (0.038) | -0.054 (0.039) | 0.046 (0.040) | -0.057 (0.041) |
| T 3: Run Block | 0.015 (0.057) | 0.030 (0.033) | 0.024 (0.066) | 0.043 (0.040) | 0.026 (0.069) | 0.046 (0.042) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 6: Fourth Down Conversion Model Results for Guards

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| G 1: Pass Block | 0.010 (0.019) | 0.015 (0.025) | 0.007 (0.023) | 0.025 (0.030) | 0.008 (0.023) | 0.025 (0.032) |
| G 1: Run Block | -0.003 (0.023) | -0.007 (0.025) | -0.000 (0.026) | -0.013 (0.029) | -0.001 (0.027) | -0.012 (0.031) |
| G 2: Pass Block | 0.035 (0.029) | 0.038 (0.032) | 0.054 (0.034) | 0.062 (0.039) | 0.054 (0.035) | 0.066 (0.041) |
| G 2: Run Block | -0.021 (0.041) | -0.013 (0.033) | -0.022 (0.048) | -0.028 (0.040) | -0.027 (0.050) | -0.028 (0.042) |
| G 3: Pass Block | 0.026 (0.036) | 0.029 (0.035) | 0.036 (0.041) | 0.053 (0.044) | 0.036 (0.043) | 0.054 (0.046) |
| G 3: Run Block | 0.084 (0.066) | -0.050 (0.036) | 0.094 (0.077) | -0.088 (0.045)** | 0.096 (0.081) | -0.089 (0.048)* |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 7: Fourth Down Conversion Model Results for Centers

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| C 1: Pass Block | 0.041 (0.027) | -0.027 (0.034) | 0.054 (0.032)* | -0.037 (0.040) | 0.057 (0.033)* | -0.034 (0.042) |
| C 1: Run Block | 0.050 (0.042) | 0.009 (0.035) | 0.061 (0.048) | 0.015 (0.042) | 0.064 (0.050) | 0.013 (0.045) |
| C 2: Pass Block | 0.033 (0.043) | -0.009 (0.041) | 0.055 (0.049) | -0.022 (0.048) | 0.054 (0.051) | -0.018 (0.050) |
| C 2: Run Block | 0.023 (0.084) | 0.002 (0.041) | 0.010 (0.099) | 0.005 (0.048) | 0.013 (0.104) | 0.002 (0.050) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 8: Fourth Down Conversion Model Results for Defensive Ends

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| DE 1: Pass Rush | -0.040 (0.024)* | 0.030 (0.033) | -0.046 (0.027)* | 0.038 (0.040) | -0.048 (0.028)* | 0.041 (0.043) |
| DE 1: Run Defense | 0.015 (0.026) | -0.028 (0.034) | 0.017 (0.029) | -0.029 (0.040) | 0.019 (0.030) | -0.034 (0.043) |
| DE 2: Pass Rush | 0.009 (0.045) | -0.062 (0.053) | 0.007 (0.051) | -0.085 (0.063) | 0.011 (0.053) | -0.089 (0.067) |
| DE 2: Run Defense | -0.098 (0.047)** | 0.047 (0.052) | -0.129 (0.053)** | 0.066 (0.062) | -0.133 (0.055)** | 0.072 (0.066) |
| DE 3: Pass Rush | 0.015 (0.079) | -0.057 (0.079) | 0.005 (0.093) | -0.034 (0.099) | 0.009 (0.098) | -0.036 (0.105) |
| DE 3: Run Defense | -0.010 (0.070) | 0.059 (0.078) | -0.007 (0.082) | 0.029 (0.097) | -0.006 (0.086) | 0.034 (0.103) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 9: Fourth Down Conversion Model Results for Defensive Tackles

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| DT 1: Pass Rush | 0.048 (0.042) | -0.030 (0.057) | 0.054 (0.047) | -0.023 (0.067) | 0.062 (0.049) | -0.024 (0.071) |
| DT 1: Run Defense | -0.022 (0.042) | 0.013 (0.057) | -0.034 (0.047) | 0.004 (0.067) | -0.034 (0.049) | -0.000 (0.071) |
| DT 2: Pass Rush | 0.043 (0.066) | 0.013 (0.081) | 0.062 (0.074) | 0.012 (0.097) | 0.064 (0.077) | 0.015 (0.102) |
| DT 2: Run Defense | -0.053 (0.062) | -0.075 (0.080) | -0.075 (0.070) | -0.087 (0.097) | -0.077 (0.073) | -0.094 (0.103) |
| DT 3: Pass Rush | -0.032 (0.107) | 0.034 (0.108) | -0.036 (0.123) | 0.036 (0.131) | -0.044 (0.128) | 0.041 (0.139) |
| DT 3: Run Defense | -0.112 (0.076) | -0.020 (0.108) | -0.132 (0.086) | -0.021 (0.130) | -0.146 (0.090) | -0.019 (0.139) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 10: Fourth Down Conversion Model Results for Nose Tackles

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| NT 1: Pass Rush | -0.061 (0.114) | 0.262 (0.134)* | -0.091 (0.140) | 0.366 (0.169)** | -0.097 (0.146) | 0.383 (0.177)** |
| NT 1: Run Defense | 0.065 (0.101) | -0.242 (0.133)* | 0.065 (0.123) | -0.339 (0.166)** | 0.077 (0.128) | -0.352 (0.174)** |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 11: Fourth Down Conversion Model Results for Inside Linebackers

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| ILB 1: Man Coverage | -0.052 (0.042) | 0.011 (0.041) | -0.064 (0.048) | 0.009 (0.048) | -0.067 (0.050) | 0.016 (0.050) |
| ILB 1: Zone Coverage | 0.008 (0.036) | 0.036 (0.043) | 0.003 (0.041) | 0.064 (0.050) | 0.005 (0.042) | 0.060 (0.053) |
| ILB 1: Run Defense | 0.014 (0.034) | -0.031 (0.040) | 0.025 (0.040) | -0.044 (0.047) | 0.029 (0.042) | -0.049 (0.050) |
| ILB 2: Man Coverage | 0.020 (0.077) | 0.001 (0.058) | 0.034 (0.090) | -0.011 (0.068) | 0.032 (0.095) | -0.015 (0.072) |
| ILB 2: Zone Coverage | 0.005 (0.057) | -0.013 (0.057) | -0.001 (0.066) | -0.021 (0.069) | -0.002 (0.070) | -0.019 (0.073) |
| ILB 2: Run Defense | 0.088 (0.057) | -0.009 (0.046) | 0.104 (0.066) | 0.003 (0.059) | 0.101 (0.070) | 0.004 (0.062) |
| ILB 3: Man Coverage | -0.104 (0.087) | 0.022 (0.039) | -0.133 (0.099) | 0.038 (0.047) | -0.133 (0.104) | 0.032 (0.050) |
| ILB 3: Zone Coverage | 0.029 (0.062) | -0.040 (0.048) | 0.042 (0.072) | -0.050 (0.057) | 0.042 (0.075) | -0.047 (0.060) |
| ILB 3: Run Defense | 0.079 (0.069) | 0.022 (0.041) | 0.121 (0.081) | 0.016 (0.048) | 0.113 (0.085) | 0.018 (0.051) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 12: Fourth Down Conversion Model Results for Outside Linebackers

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| OLB 1: Man Coverage | 0.058 (0.049) | -0.032 (0.022) | 0.060 (0.059) | -0.050 (0.028)* | 0.068 (0.063) | -0.052 (0.030)* |
| OLB 1: Zone Coverage | -0.032 (0.032) | -0.007 (0.027) | -0.041 (0.037) | -0.023 (0.032) | -0.043 (0.038) | -0.022 (0.033) |
| OLB 1: Run Defense | 0.010 (0.028) | 0.014 (0.028) | 0.022 (0.032) | 0.032 (0.034) | 0.024 (0.033) | 0.030 (0.036) |
| OLB 2: Man Coverage | -0.031 (0.073) | -0.021 (0.026) | -0.047 (0.085) | -0.035 (0.031) | -0.053 (0.089) | -0.033 (0.033) |
| OLB 2: Zone Coverage | 0.003 (0.049) | 0.015 (0.031) | 0.012 (0.057) | 0.014 (0.040) | 0.012 (0.059) | 0.010 (0.042) |
| OLB 2: Run Defense | 0.052 (0.046) | 0.009 (0.030) | 0.056 (0.052) | 0.026 (0.038) | 0.062 (0.055) | 0.030 (0.040) |
| OLB 3: Man Coverage | 0.051 (0.095) | 0.017 (0.028) | 0.060 (0.112) | 0.025 (0.035) | 0.063 (0.117) | 0.025 (0.037) |
| OLB 3: Zone Coverage | 0.070 (0.062) | -0.002 (0.035) | 0.099 (0.074) | -0.000 (0.044) | 0.109 (0.078) | -0.002 (0.046) |
| OLB 3: Run Defense | 0.002 (0.069) | -0.005 (0.034) | -0.013 (0.082) | -0.015 (0.042) | -0.015 (0.086) | -0.012 (0.045) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 13: Fourth Down Conversion Model Results for Cornerbacks

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| CB 1: Man Coverage | -0.011 (0.016) | -0.026 (0.021) | -0.012 (0.018) | -0.042 (0.026) | -0.014 (0.019) | -0.043 (0.027) |
| CB 1: Zone Coverage | -0.016 (0.016) | 0.017 (0.022) | -0.019 (0.018) | 0.024 (0.027) | -0.019 (0.019) | 0.027 (0.028) |
| CB 1: Run Defense | 0.002 (0.016) | 0.011 (0.021) | 0.000 (0.018) | 0.017 (0.026) | 0.001 (0.019) | 0.018 (0.027) |
| CB 2: Man Coverage | -0.031 (0.014)** | 0.014 (0.020) | -0.034 (0.017)** | 0.004 (0.026) | -0.036 (0.017)** | 0.003 (0.028) |
| CB 2: Zone Coverage | -0.003 (0.015) | 0.017 (0.020) | 0.003 (0.018) | 0.011 (0.029) | 0.003 (0.019) | 0.012 (0.031) |
| CB 2: Run Defense | -0.028 (0.015)* | -0.007 (0.019) | -0.039 (0.018)** | -0.002 (0.027) | -0.041 (0.019)** | -0.001 (0.029) |
| CB 3: Man Coverage | -0.011 (0.025) | -0.037 (0.024) | -0.014 (0.030) | -0.045 (0.030) | -0.014 (0.031) | -0.049 (0.032) |
| CB 3: Zone Coverage | -0.012 (0.025) | 0.036 (0.027) | -0.009 (0.029) | 0.035 (0.033) | -0.011 (0.030) | 0.038 (0.036) |
| CB 3: Run Defense | 0.006 (0.032) | -0.004 (0.025) | 0.003 (0.036) | 0.005 (0.031) | 0.006 (0.038) | 0.006 (0.033) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 14: Fourth Down Conversion Model Results for Free Safeties

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| FS 1: Man Coverage | 0.034 (0.038) | -0.005 (0.032) | 0.051 (0.043) | -0.008 (0.039) | 0.052 (0.045) | -0.007 (0.042) |
| FS 1: Zone Coverage | 0.014 (0.034) | 0.011 (0.036) | 0.029 (0.040) | 0.019 (0.043) | 0.028 (0.042) | 0.019 (0.045) |
| FS 1: Run Defense | -0.128 (0.036)*** | 0.031 (0.035) | -0.164 (0.042)*** | 0.037 (0.041) | -0.170 (0.045)*** | 0.040 (0.044) |
| FS 2: Man Coverage | 0.131 (0.083) | 0.007 (0.051) | 0.169 (0.098)* | 0.001 (0.062) | 0.179 (0.103)* | 0.005 (0.064) |
| FS 2: Zone Coverage | 0.055 (0.076) | -0.059 (0.055) | 0.051 (0.088) | -0.068 (0.066) | 0.060 (0.092) | -0.075 (0.070) |
| FS 2: Run Defense | -0.122 (0.085) | 0.032 (0.051) | -0.134 (0.101) | 0.046 (0.060) | -0.145 (0.107) | 0.049 (0.063) |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 15: Fourth Down Conversion Model Results for Strong Safeties

| | LPM | | Probit | | Logit | |
|---|---|---|---|---|---|---|
| Metric | Pass | Rush | Pass | Rush | Pass | Rush |
| SS 1: Man Coverage | 0.004 (0.045) | -0.052 (0.041) | 0.011 (0.053) | -0.073 (0.051) | 0.010 (0.056) | -0.075 (0.055) |
| SS 1: Zone Coverage | -0.008 (0.044) | 0.074 (0.041)* | -0.003 (0.051) | 0.096 (0.054)* | -0.006 (0.054) | 0.097 (0.058)* |
| SS 1: Run Defense | 0.006 (0.047) | -0.044 (0.040) | -0.006 (0.056) | -0.060 (0.049) | -0.003 (0.058) | -0.062 (0.053) |
| SS 2: Man Coverage | 0.019 (0.080) | -0.056 (0.048) | 0.046 (0.095) | -0.071 (0.061) | 0.050 (0.099) | -0.069 (0.064) |
| SS 2: Zone Coverage | -0.009 (0.074) | 0.018 (0.054) | -0.024 (0.085) | 0.012 (0.066) | -0.023 (0.089) | 0.010 (0.069) |
| SS 2: Run Defense | -0.222 (0.087)** | 0.088 (0.048)* | -0.295 (0.105)*** | 0.129 (0.056)** | -0.301 (0.111)*** | 0.132 (0.058)** |

*Notes:* Table displays marginal effects with standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. The 'Pass' column shows the main effect; 'Rush' shows the interaction with rush_attempt. Standard errors are heteroskedasticity-robust.

Table 16: IMR Correction Terms and Model Controls

| Variable | LPM | Probit | Logit |
|---|---|---|---|
| **IMR Correction Terms** | | | |
| IMR (Linear) | -0.447 (0.235)* | -0.586 (0.274)** | -0.626 (0.288)** |
| IMR (Polynomial 2nd order) | 0.928 (0.477)* | 1.245 (0.567)** | 1.326 (0.600)** |
| IMR (Polynomial 3rd order) | -0.474 (0.252)* | -0.650 (0.310)** | -0.686 (0.332)** |
| **Model Controls** | | | |
| Situational Controls | Yes | Yes | Yes |
| Game & Team Controls | Yes | Yes | Yes |
| Weather Controls | Yes | Yes | Yes |
| Coach Fixed Effects | Yes | Yes | Yes |
| Play-Type Controls | Yes | Yes | Yes |

*Notes:*
Table displays coefficients for IMR terms and indicates inclusion of control groups.