

## 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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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

Metric	LPM		Probit		Logit	
	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: Table 16: IMR Correction Terms and Model Controls

Variable	LPM	Probit	Logit
<b>IMR Correction Terms</b>			
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)**
<b>Model Controls</b>			
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.