Change the Tempo

Optimizing NFL Offensive Timing Variation

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Background

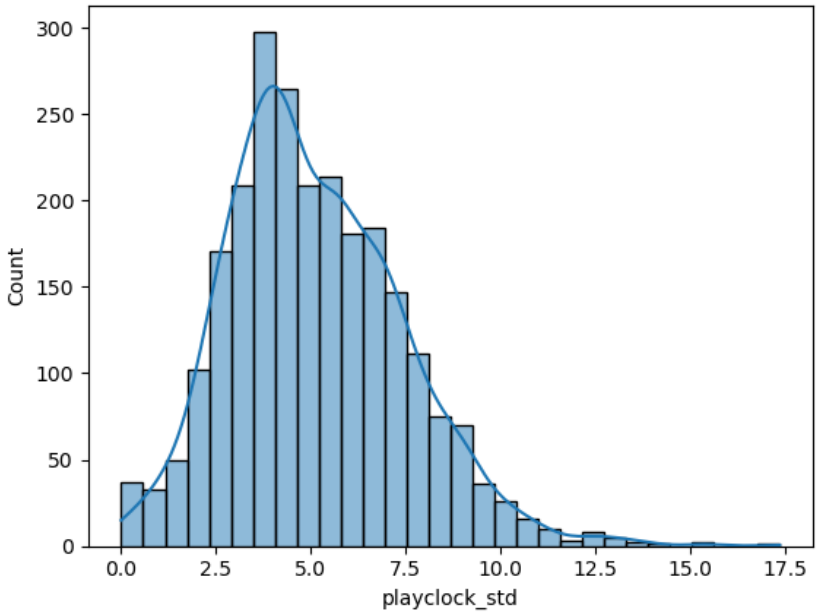
- NFL Offenses must snap the ball before play clock expires
  - ‘In Rhythm’ – team operating at a steady speed
  - ‘Tempo’ – Offense is playing fast
- Data from 2025 NFL Big Data Bowl

Does varying tempo in the same drive improve offensive efficiency?

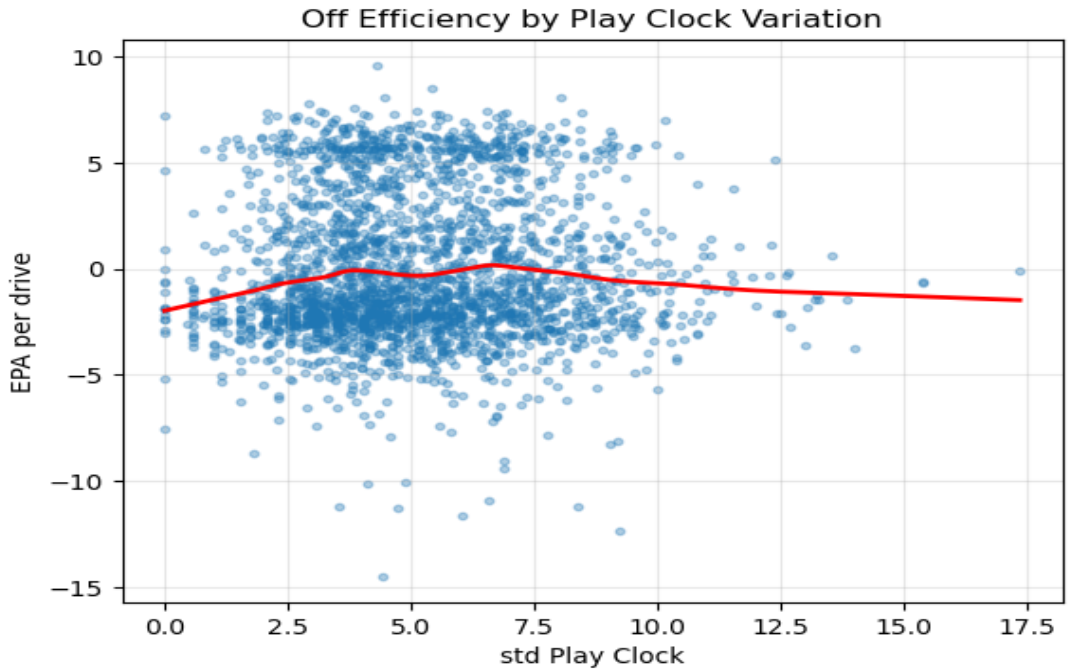
Is there an optimal variation for offensive efficiency?

Data

- Targets
  - playClockAtSnap – value of play clock at time of snap (standard deviation used as variance measure)
  - EPA – Expected Points Added, used to measure offensive efficiency



Models



- Regression models
  - Linear – Show connection
  - Quadratic – Parabolic shape
- Optimization
  - Bounded scalar – Unconstrained to Constrained
  - Bootstrapping – Show uncertainty

Results

- Regression
  - Linear shows positive connection: 0.03 epa per extra unit of variation
  - Quadratic shows concave parabolic arc implying you can be too varied
- Optimization
  - All optimization equations show optimal standard deviation of 6.3 seconds
  - 95% CI from 5.60-7.04

Discussion

- Low R^2 values
- Variation among top offenses not high