Number of possessions or efficiency per possession: which better determines offensive success?

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December 2023

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1 Objective

This analysis was motivated by the following excerpt from Ben Taylor's *Thinking About Basketball*:

"Basketball is a per-possession game... It does not matter if a team plays fast or slow; a team scoring 80 points can run a more efficient offense than a team scoring 100 points... if the team scoring 100 points needed more possessions. There is absolutely zero correlation between a team's pace and its offensive efficiency... Because of alternating possession rules, basketball success is completely determined by per-possession efficiency. There is a near perfect correlation (0.97) between a team's efficiency and wins." (pg. 32)

To attempt to reproduce this analysis, I examined teams from the last 20 seasons, determining how their pace and points-per-possession were correlated with offensive rating and number of wins.

Variable	Pearson coeff.	Spearman coeff.
Pace	.525	.518
PPP	.995	.994

Table 1: Correlations between pace/PPP and offensive rating

Variables	Pearson coeff.	Spearman coeff.
Pace & PPP	.552	.544

Table 2: Correlations between pace and PPP

2 Offensive Rating

For each season dating back to 2000-01, each team's offensive rating, pace, and points-per-possession (PPP) were collected via API calls. All this information was accumulated into a single dataset, containing 686 points.

To determine the correlation of pace and PPP with offensive rating, two different correlation measures were used: Pearson coefficients and Spearman rank. The former covered linear relationships between the variables, while the latter captured any non-linearity. The values are presented in Table 1.

At first glance, the Pearson coefficient for pace (.525) seems to suggest that number of possessions is an important determiner of offensive efficiency. However, the above analysis neglected to account for the role of pace in determining points-per-possession, which may be skewing the correlation. Take, for instance, the 2023-24 Pacers. A large component of their historically-good offense is their speed. Even after a made basket, the team initiates their plays quickly, starting pick-and-roll actions within seconds of the inbound. Their speed deprives the defense of the time needed to set up the desired matchups, giving Pacers players easier shots, increasing per-possession efficiency.

To confirm, let's check the correlation coefficients between pace and PPP (Table 2). The results suggest that there is a moderate linear relationship between pace and PPP, so the next step should be to run partial and multiple regressions to adjust for PPP, determining the direct relationship between pace and offensive rating.

3 Wins