Can we make a “better” Pythagorean Expectation for Basketball?

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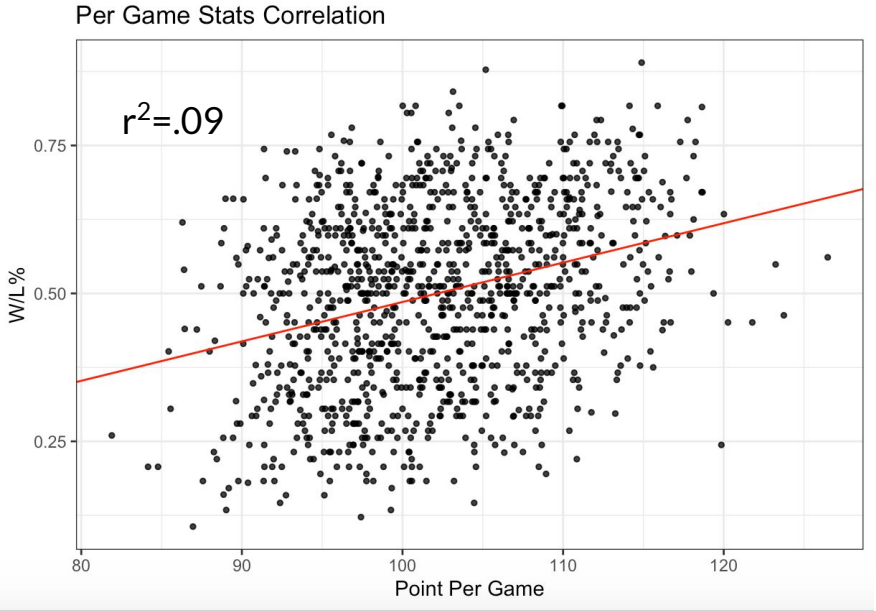
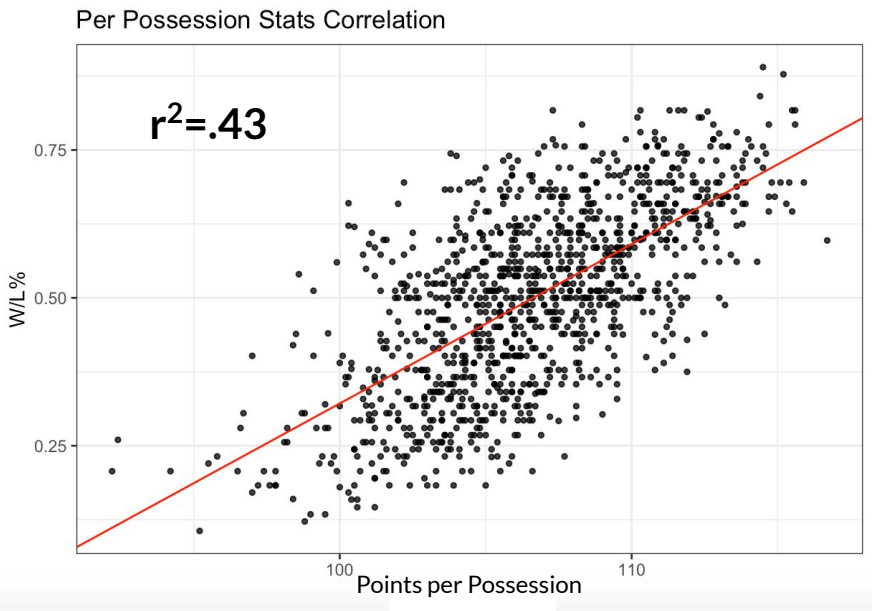
Points Per 100 Possessions vs. Per Game





Pythagorean Expectation for Basketball

This is the currently used formula for Pythag in basketball right now:

$$\text{Pythag} = \frac{PF^{13.91}}{(PF^{13.91}+PA^{13.91})}$$

Our improved formula:

$$\text{Pythag} = \frac{\text{ORtg}^2}{(\text{ORtg}^2+\text{DRtg}^2)}$$

Our next thought:

Was the league tougher in some years than others? And if so, how can we adjust for that and find a way to make all teams equal?

So how do we do this?

This is what we came up with for Strength of Schedule per Possession:

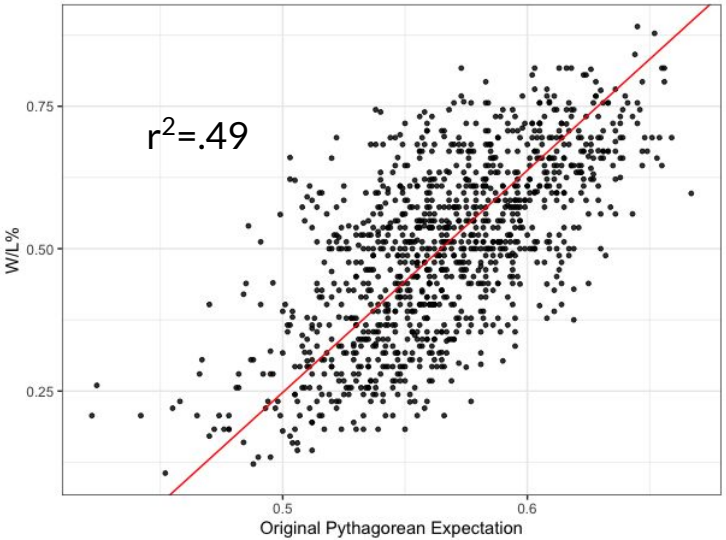
SOSPP= (ORtg) - (Average DRtg for the rest of the league in that year)

Final Product:

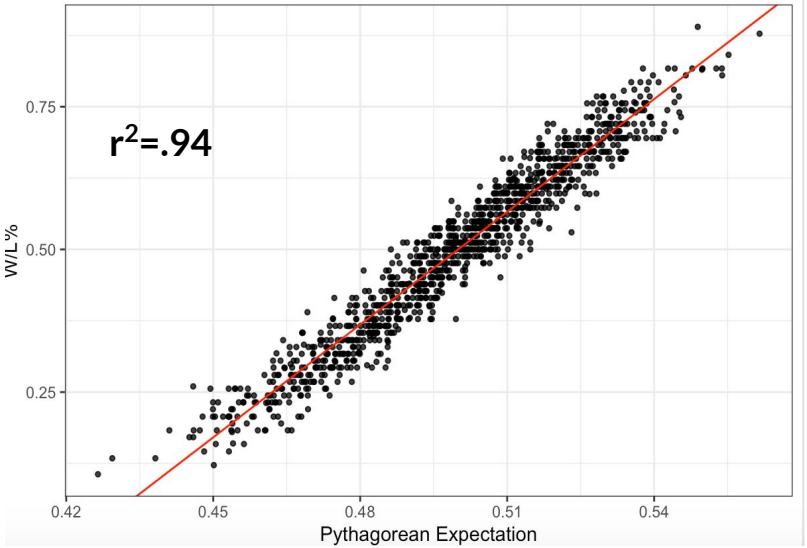
SOSwPYTH= SOSPP x PythPP

Which Pythagorean expectation is better?

Theirs



Ours



What can we do with this?

- Because we standardized for both competition between seasons and home-field advantage
  - All-time teams?
  - NBA Coronavirus Bubble?
- Let’s do both!

Who are the best and worst teams of all time?

The Best:

Most of the best teams have a SOSwPYTH > .6

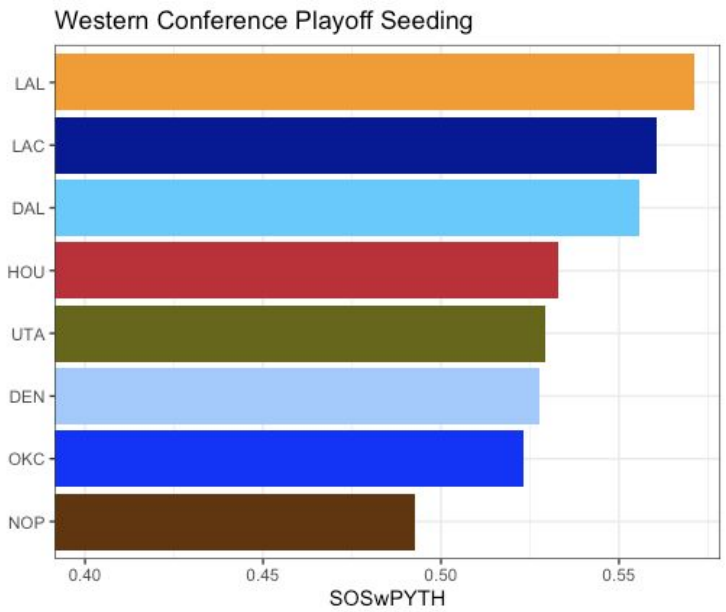
Season	Tm	W	L	W/L%	SOSwPYTH
1995	CHI	72	10	0.878	0.6354294
1996	CHI	69	13	0.841	0.6202418
2007	BOS	66	16	0.805	0.6171688
2015	SAS	67	15	0.817	0.6170478
2016	GSW	67	15	0.817	0.6143210

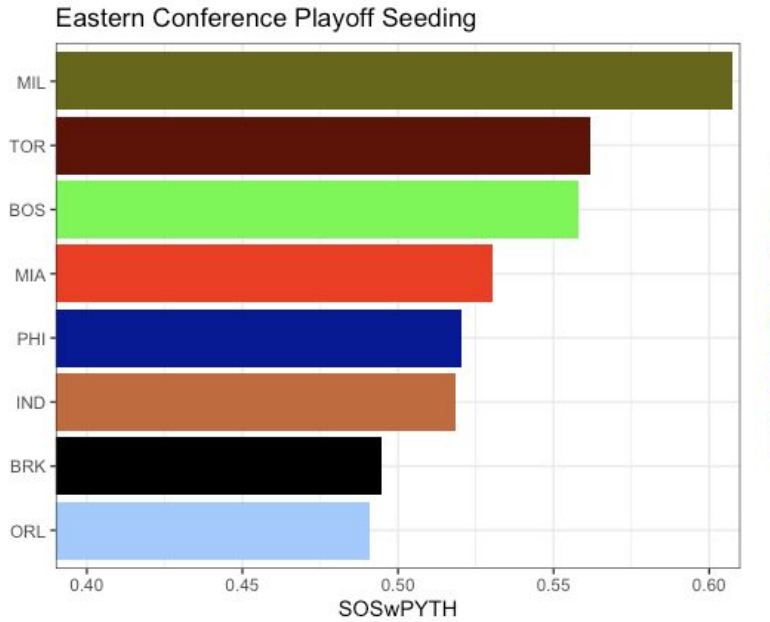
The Worst:

Most of the worst teams have a SOSwPYTH < .4

Season	Tm	W	L	W/L%	SOSwPYTH
2011	CHA	7	59	0.106	0.3677548
1992	DAL	11	71	0.134	0.3724907
1997	DEN	11	71	0.134	0.3869762
1999	LAC	15	67	0.183	0.3917714
1982	HOU	14	68	0.171	0.3986806

Playoff Seedings after the simulated regular season games and play-ins





Playoff Bracket

Conclusion

- Per possession is better measure/predictor for success than per game
- We found a better pythagorean expectation for basketball
- Standardize for seasons and home-field advantage through measure strength of schedule using per possession numbers
- Combine the new pythagorean expectation and the new strength of schedule
- Find the greatest/worst teams of all time
- Simulate the NBA bubble championship

Thanks for Listening

Questions?