Examining the Effect of NCAA Systems in the NBA Draft

Stanford Sports Analytics Club

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2016 Basketball Analytics Summit

Overview

Framework

Framework

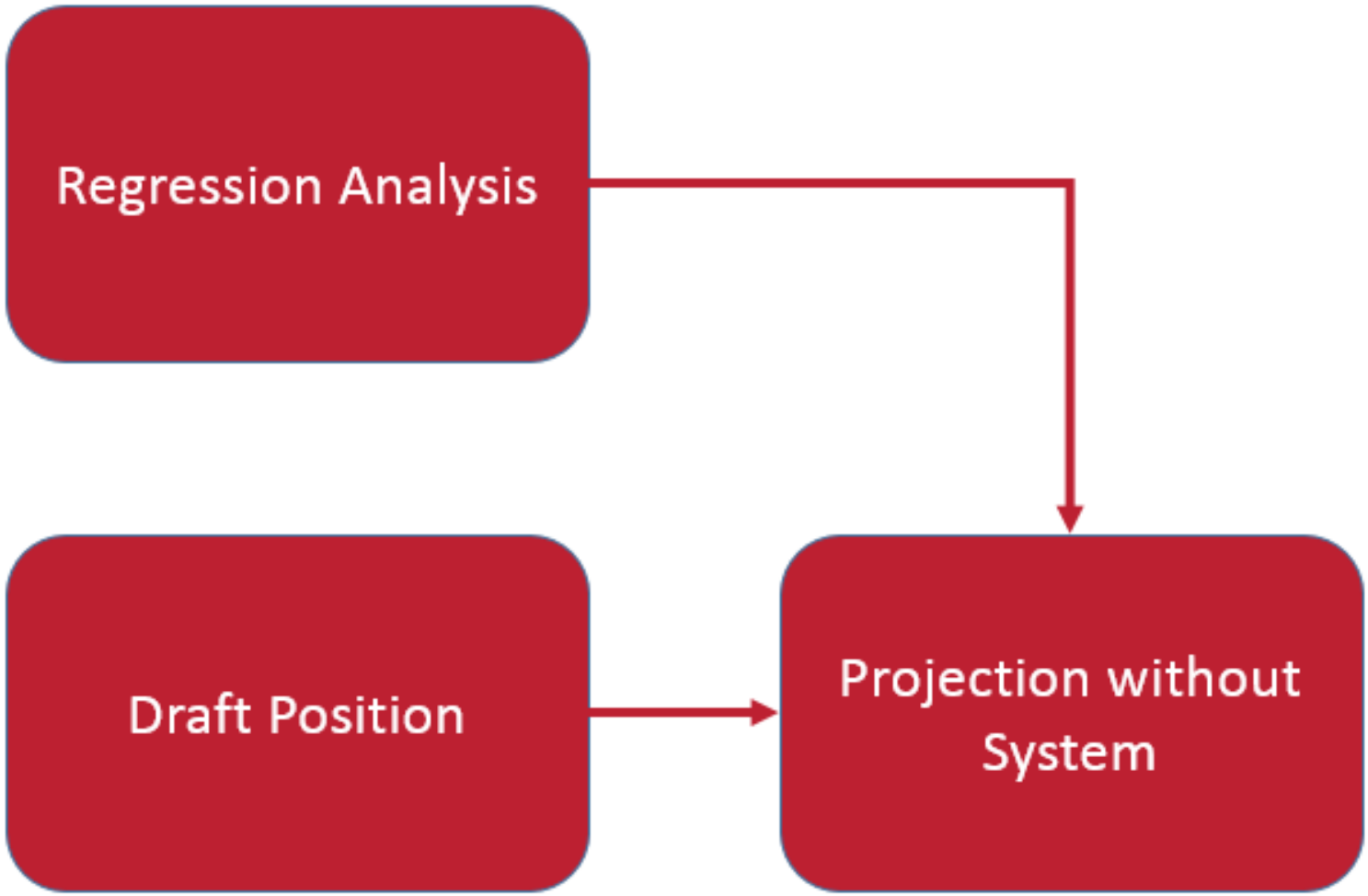
- Framework to Assess NCAA Offensive Systems
- Metric selection
- Definition of “star” & “bust”

Framework to Assess NCAA Offensive Systems

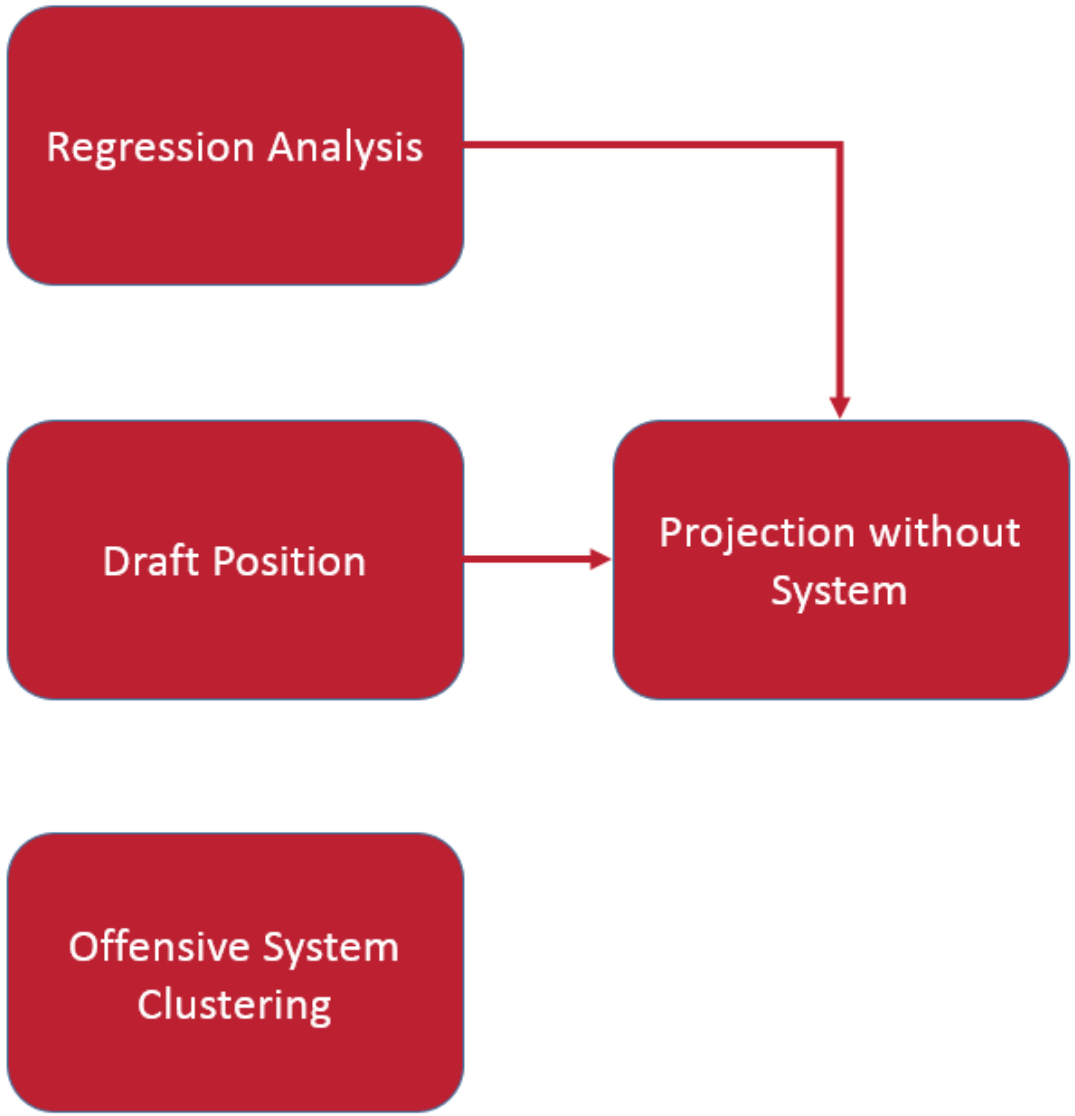
Regression Analysis

Draft Position

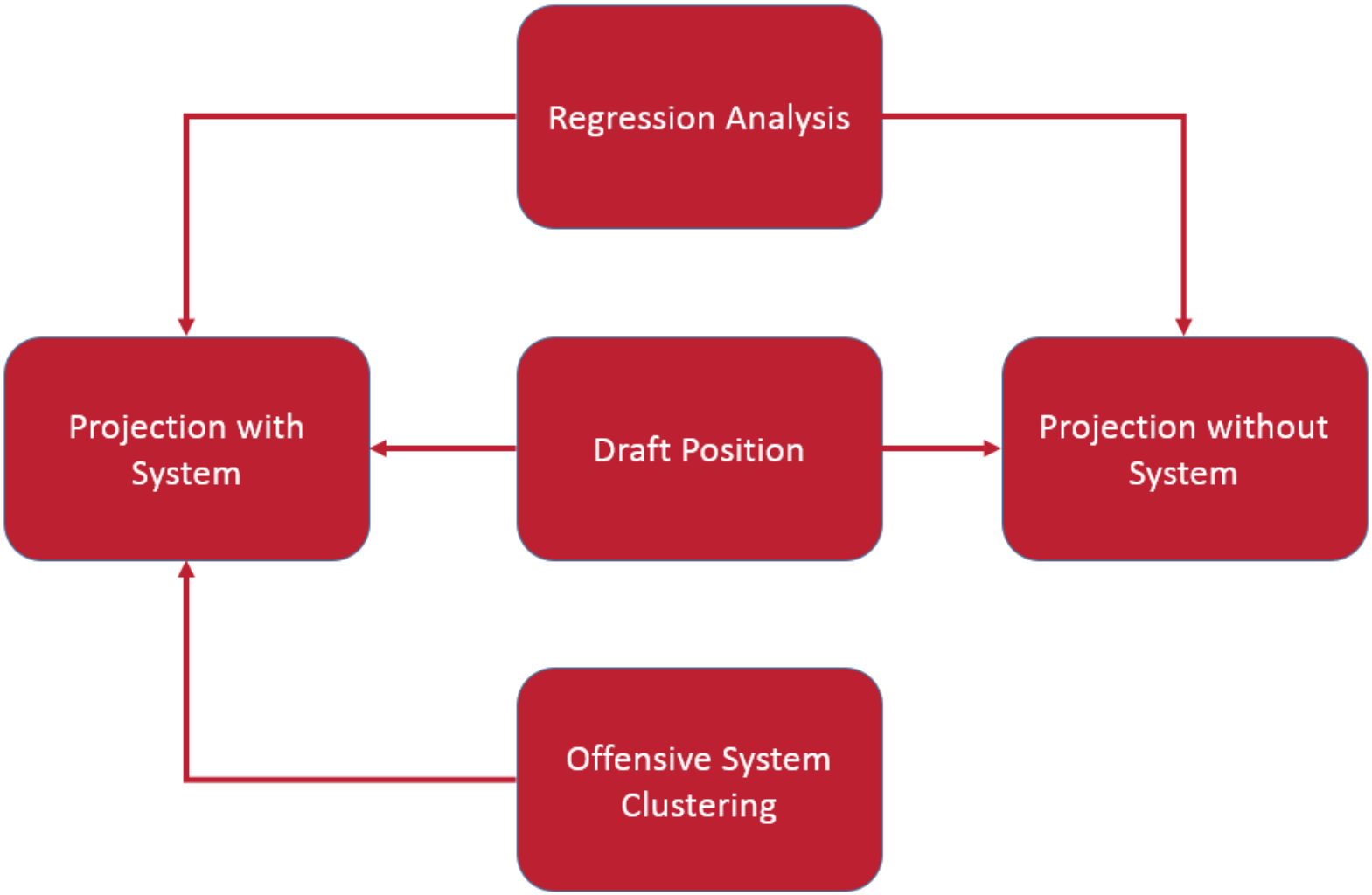
Framework to Assess NCAA Offensive Systems



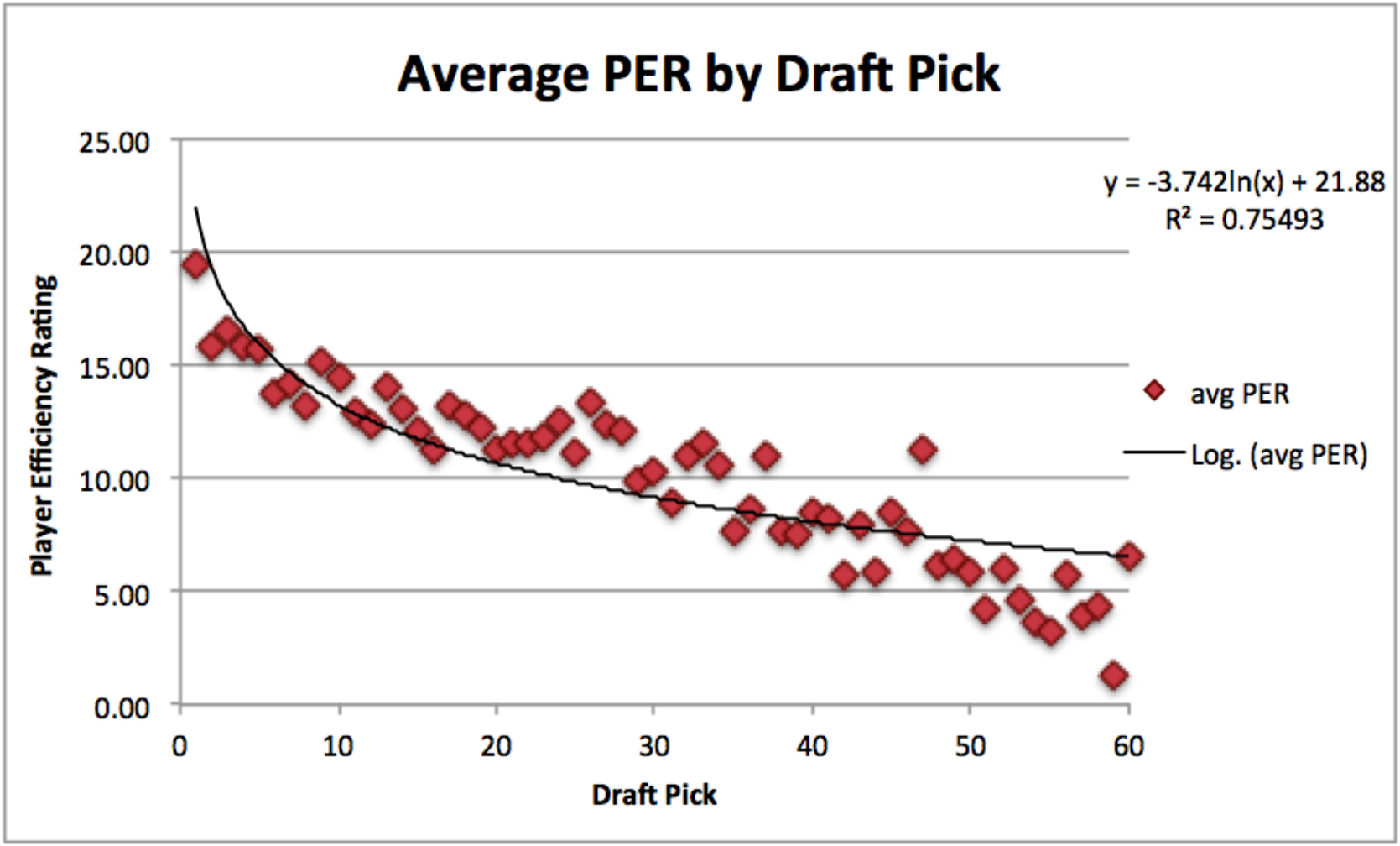
Framework to Assess NCAA Offensive Systems



Framework to Assess NCAA Offensive Systems



Metric Selection



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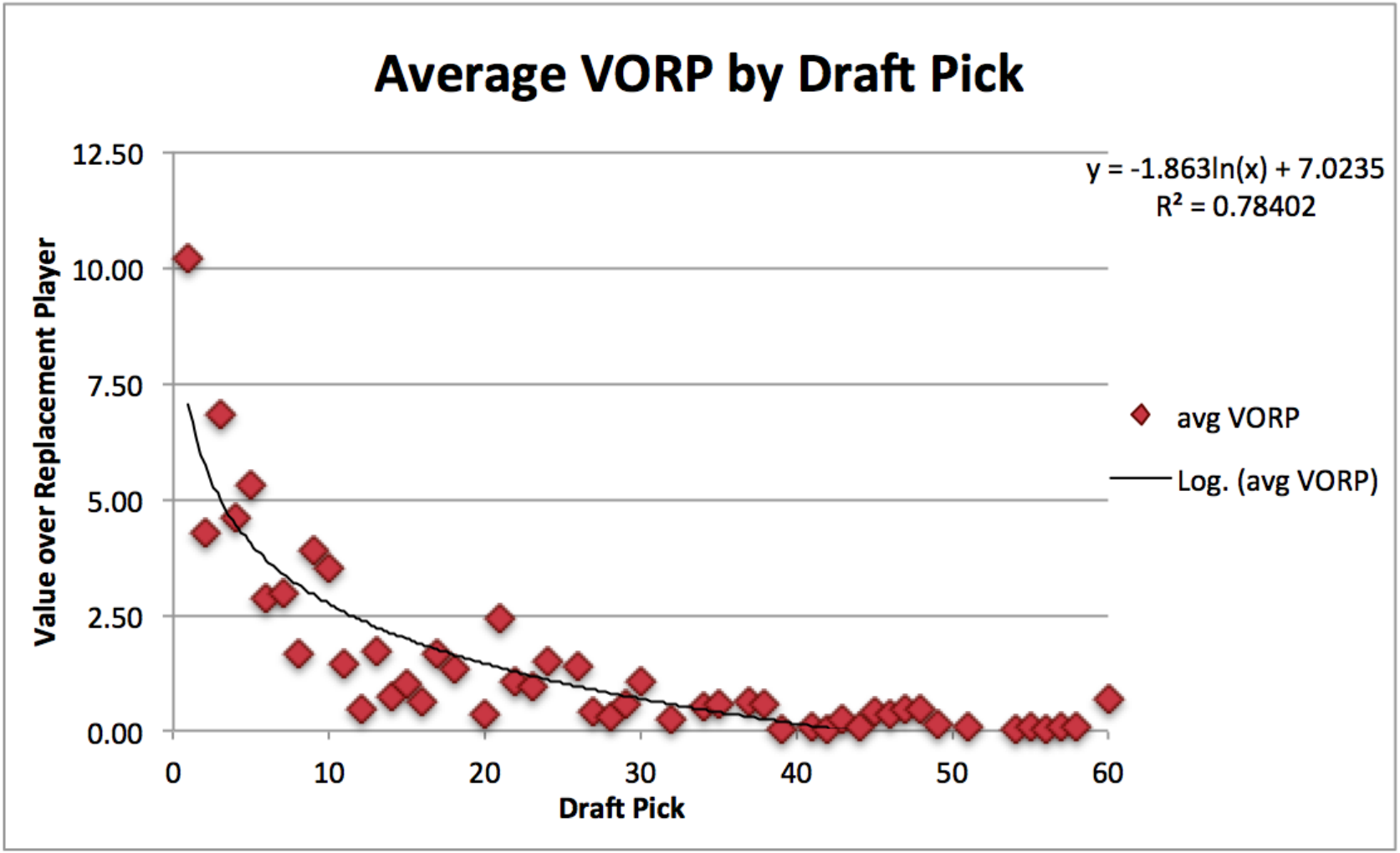
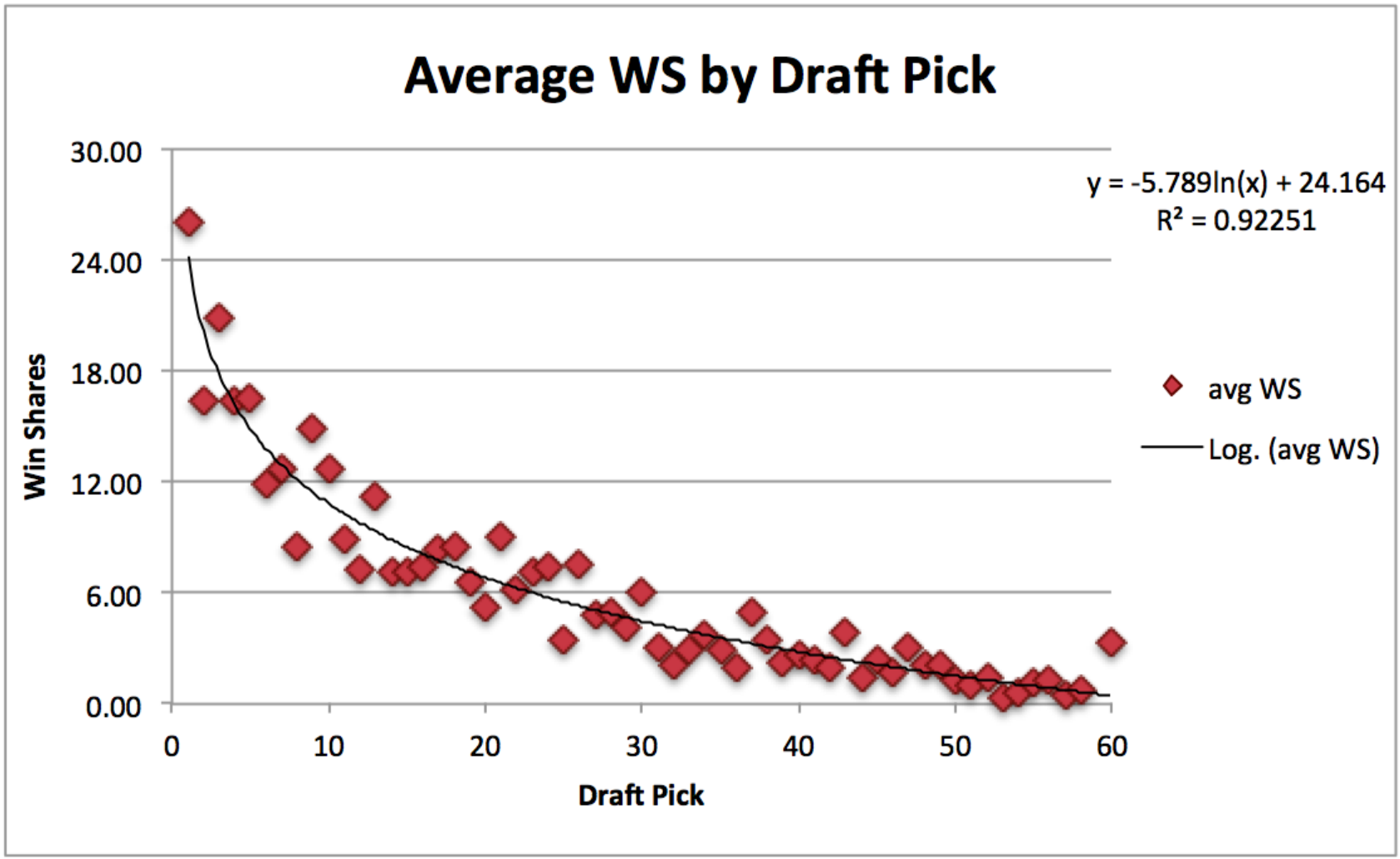


Metric Selection



Stars and Busts

Star Player	Pick #	Total WS
Kevin Durant	2	38.3
Anthony Davis	1	37.9
Brandon Roy	6	35.4
Damian Lillard	6	34.6
James Harden	3	33.7
Al Horford	3	33.3
Kevin Love	5	31.6
Derrick Rose	1	30.0
Blake Griffin	1	29.6
Rajon Rondo	21	29.1
⋮	⋮	⋮
Carl Landry	31	21.4
Ryan Anderson	21	20.9
Brook Lopez	10	20.3

Bust Player	Pick #	Net WS
Adam Morrison	3	-19.3
Greg Oden	1	-17.4
Hasheem Thabeet	2	-15.4
Jonny Flynn	6	-14.9
Wesley Johnson	4	-12.3
Joe Alexander	8	-11.7
Thomas Robinson	5	-11.5
Patrick O'Bryant	9	-10.9
Dion Waiters	4	-10.8
Corey Brewer	7	-10.7
⋮	⋮	⋮
Luke Babbitt	16	-6.4
Earl Clark	14	-6.3
Jordan Hill	8	-6.1

Regression Analysis

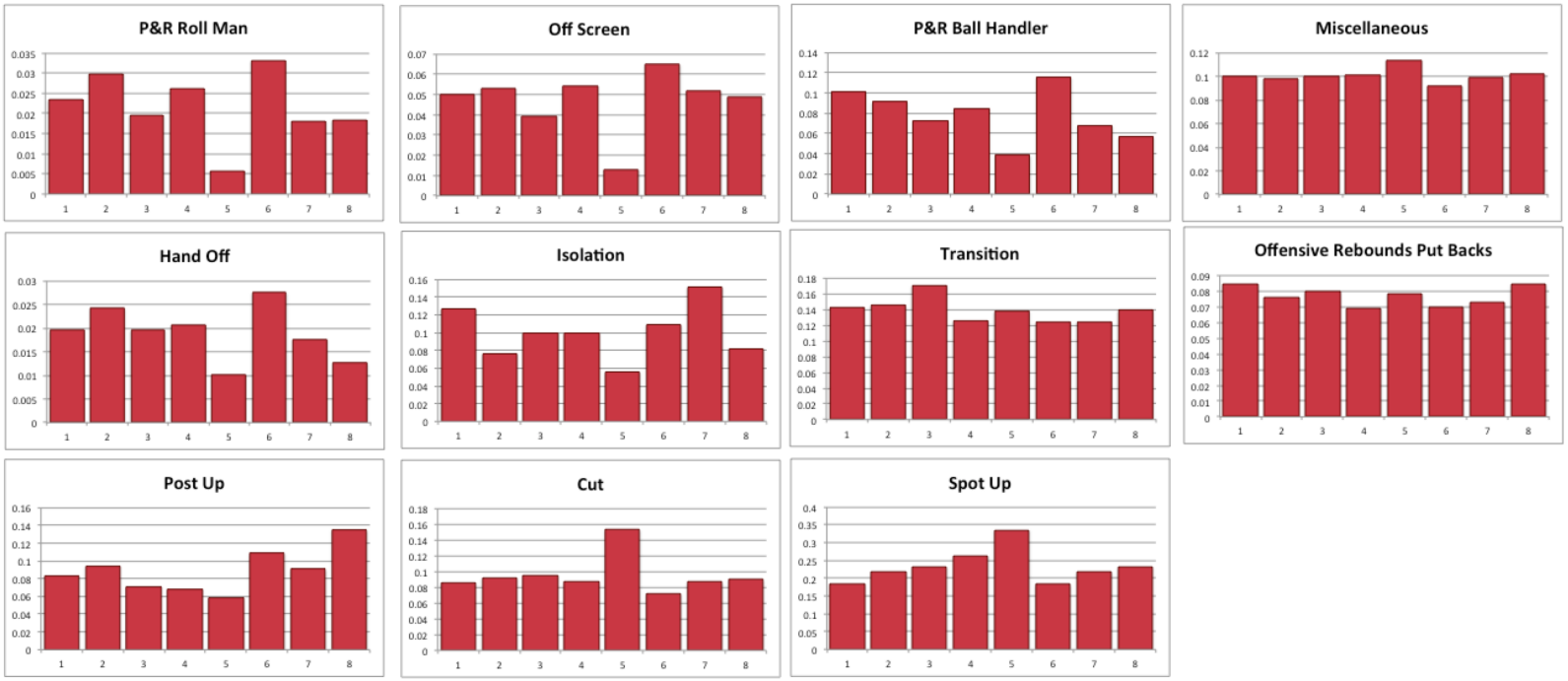
Projections for Chad Ford's Big Board

Rank	Name	eWS	95% CI
1	Ben Simmons	16.4	(4.0, 28.8)
2	Brandon Ingram	3.1	(-7.2, 13.4)
3	Dragan Bender	Intl.	–
4	Jamal Murray	11.4	(-4.0, 26.8)
5	Buddy Hield	14.3	(-1.1, 29.7)
6	Henry Ellenson	2.4	(-7.9, 12.7)
7	Kris Dunn	10.7	(-3.4, 24.8)
8	Marquese Chriss	1.8	(-8.5, 12.1)
9	Jaylen Brown	-2.1	(-17.5, 13.3)
10	Jakob Poeltl	11.5	(-0.9, 23.9)
11	Deyonta Davis	9.0	(-1.3, 19.3)
12	Ivan Rabb	9.5	(-0.8, 19.8)
13	Furkan Korkmaz	Intl.	–
14	Denzel Valentine	13.9	(-1.5, 29.4)
15	Domantas Sabonis	13.5	(3.2, 23.8)

Rank	Name	eWS	95% CI
16	Skal Labissiere	-7.0	(-19.4, 5.4)
17	Tyler Ulis	11.6	(-2.5, 25.7)
18	Diamond Stone	-2.5	(-14.9, 9.9)
19	Timothe Luwawu	Intl.	–
20	Thon Maker	Intl.	–
21	Dejounte Murray	-1.7	(-10.3, 6.9)
22	Ante Zizic	Intl.	–
23	Wade Baldwin IV	6.1	(-2.5, 14.7)
24	Demetrius Jackson	2.1	(-12.0, 16.2)
25	DeAndre Bembry	7.4	(-8.1, 22.8)
26	Thomas Bryant	-1.3	(-13.7, 11.1)
27	Jonathan Jeanne	Intl.	–
28	Ben Bentil	7.8	(-4.6, 20.2)
29	Brice Johnson	16.1	(5.8, 26.4)
30	Grayson Allen	14.8	(-0.6, 30.2)

Clustering Analysis

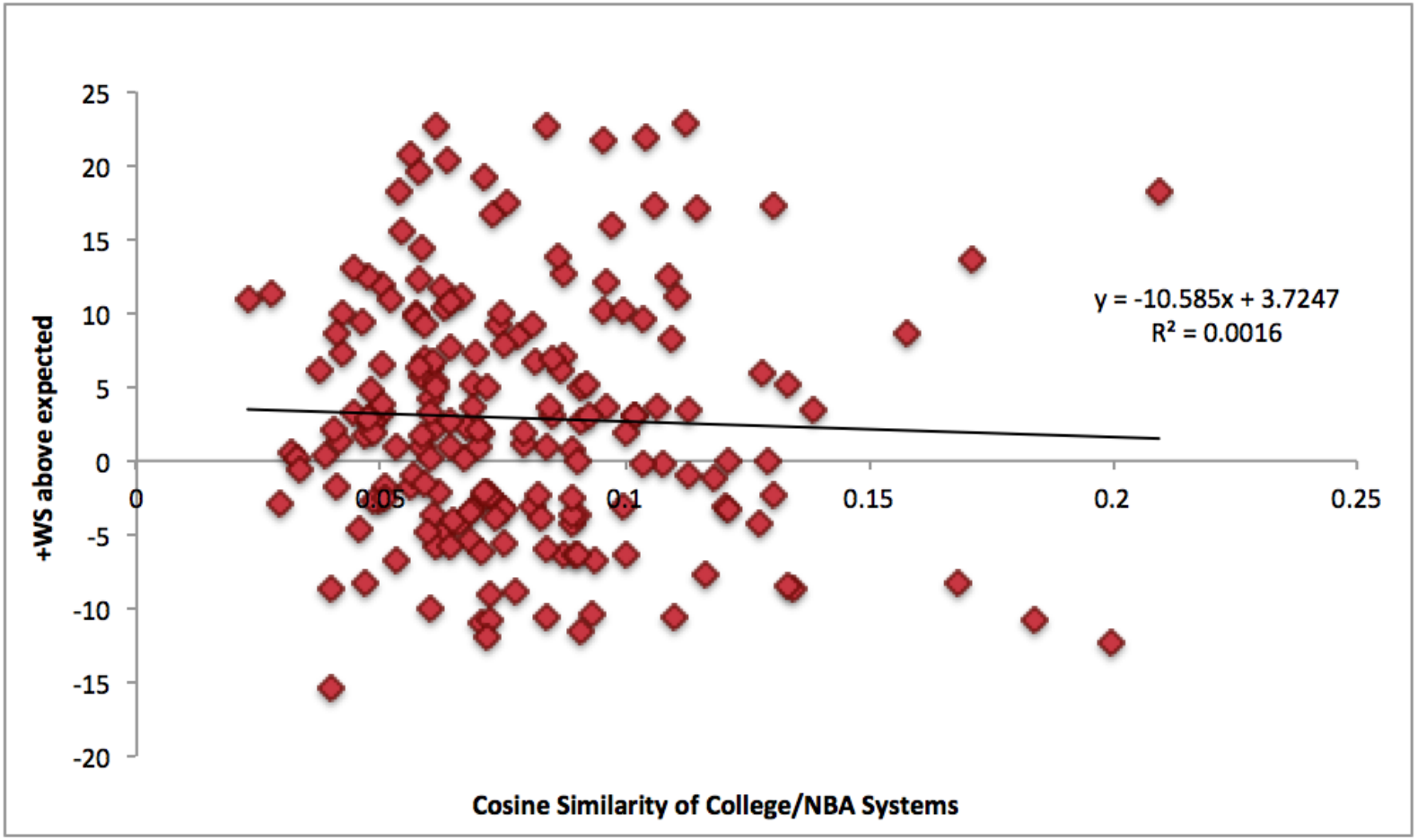
Cluster Analysis



Representative Players by Cluster

Cluster	Star	Bust	Description	T	S	B	Net WS/P
1	UF '11 (Chandler Parsons)	UConn '09 (Hasheem Thabeet)	Balanced	22	2	2	-0.105
2	Mich. St. '12 (Draymond Green)	Kansas '12 (Thomas Robinson)	–Iso +P&R +Handoff	49	3	2	-0.082
3	Marquette '11 (Jimmy Butler)	L'ville '09 (Terrence Williams)	+Transition	62	4	5	-0.263
4	Arizona St. '09 (James Harden)	UF '07 (Corey Brewer)	+Spot-Up	43	5	1	1.058
5	Morehead St. '11 (Kenneth Faried)	Syracuse '09 (Jonny Flynn)	–P&R –Iso –Off-Screen +Cut +Spot-Up	13	1	4	-2.138
6	Texas '07 (Kevin Durant)	Duke '12 (Austin Rivers)	–Spot-Up +Hand-Off +Iso	48	4	2	2.592
7	Davidson '06 (Stephen Curry)	Gonzaga '06 (Adam Morrison)	+Iso	59	9	6	1.912
8	Fresno St. '10 (Paul George)	Kansas '10 (Cole Aldrich)	–P&R –Iso +Post-Up	34	2	5	-0.976

Net WS vs. Cosine Similarity of NCAA/NBA Systems



Play Type Homogeneity

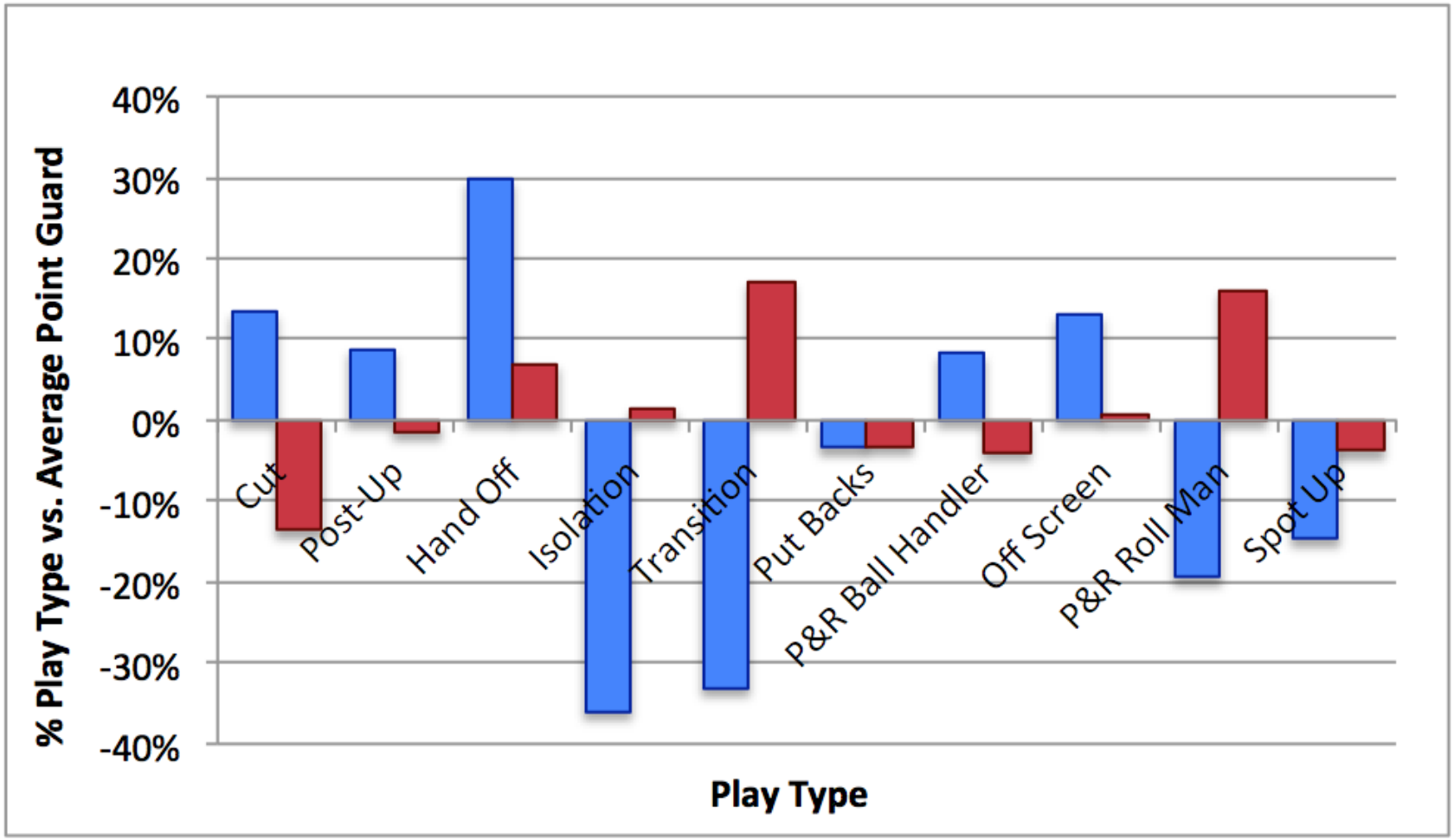
Play Type Homogeneity

All players average Euclidean distance: 0.1142

Position	Star Average Dist	Bust Average Dist
All	0.1093	0.1426
PG	0.1014	0.1813
SG	0.1107	0.1627
SF	0.0727	0.0904
PF	0.1325	0.0982
C	0.0942	0.1764

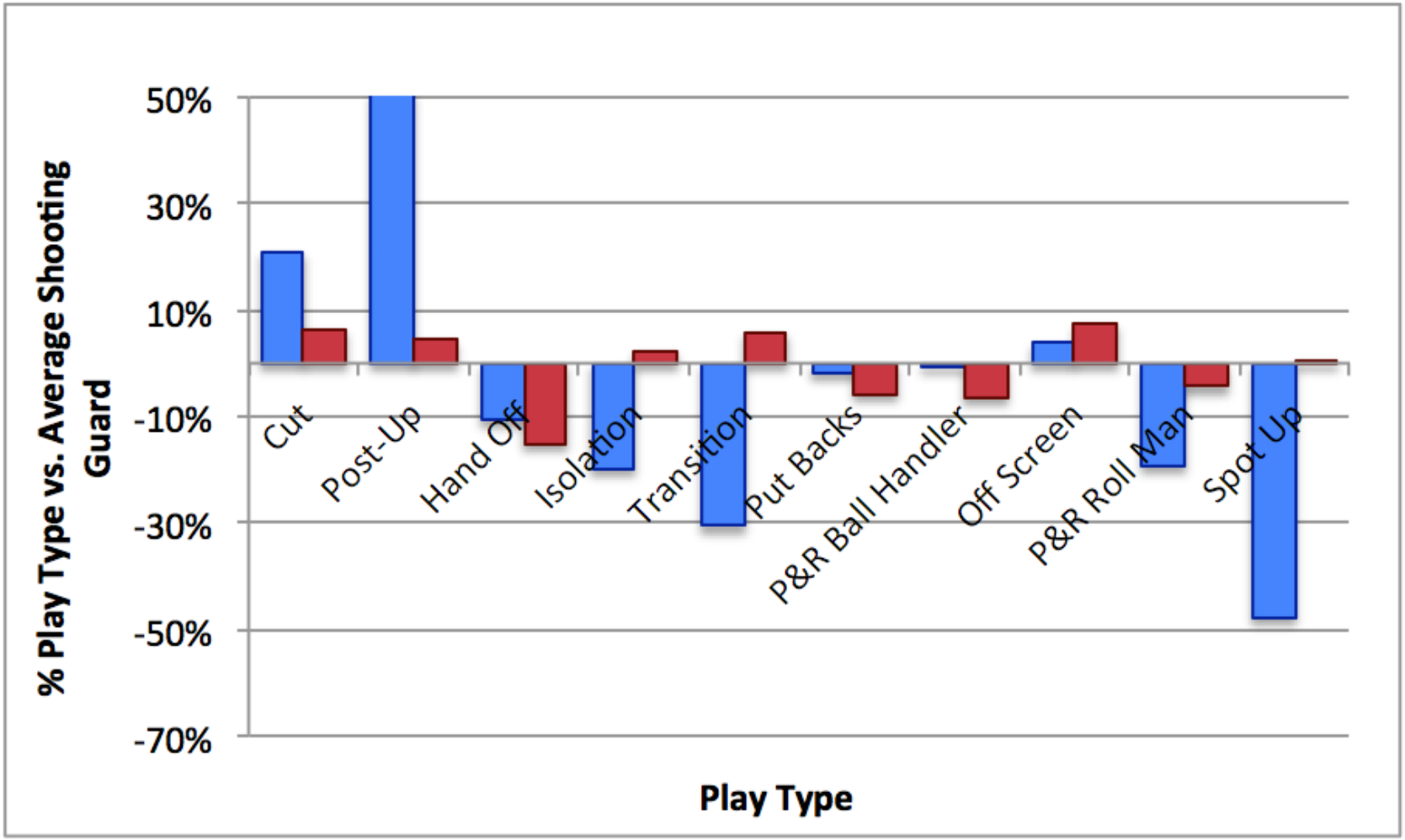
Play Types

Stars vs. Busts Team Play Type Differential - Point Guards



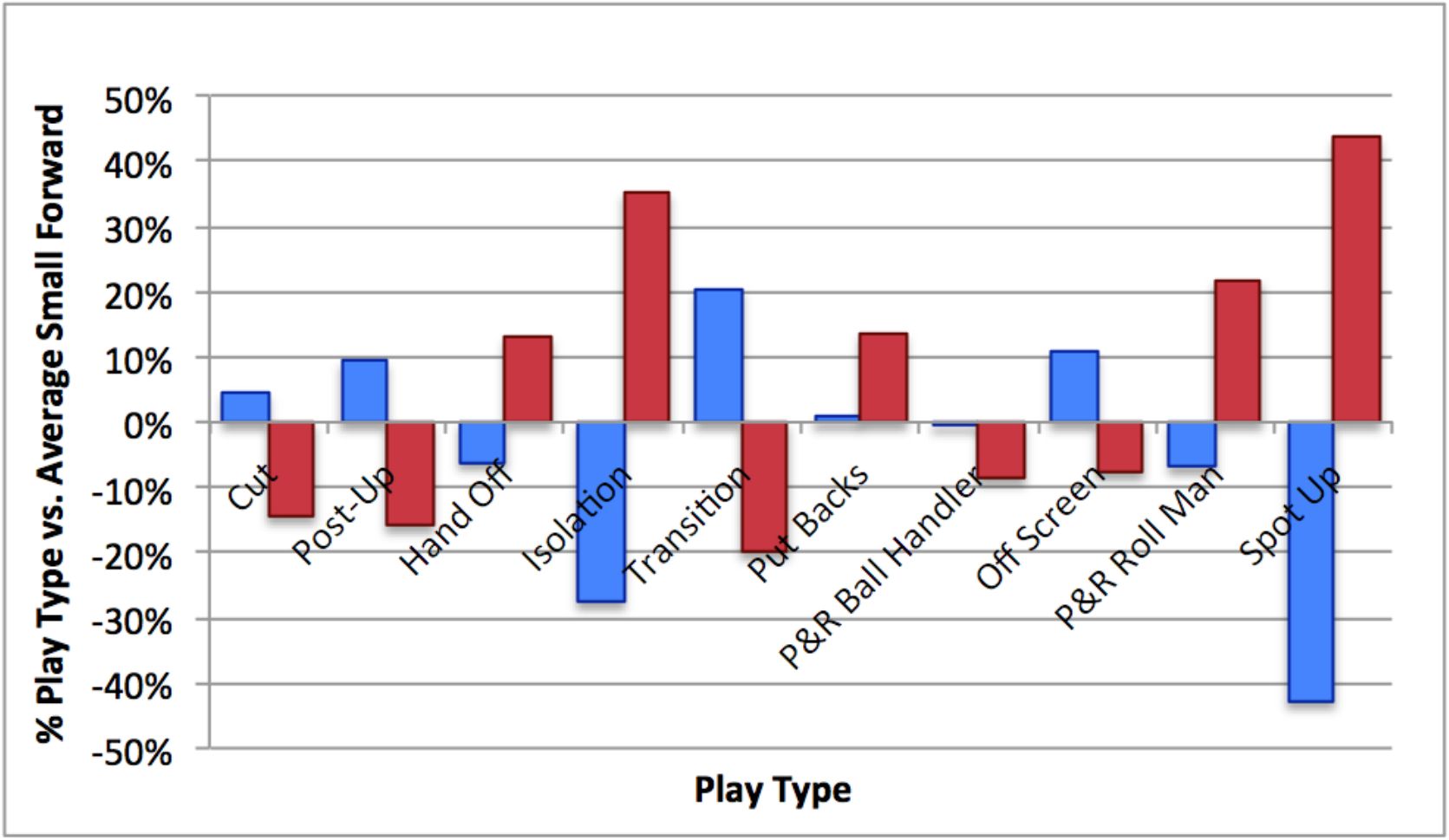
Star PGs come from systems that emphasize transition and pick and roll passing

Stars vs. Busts Team Play Type Differential - Shooting Guards



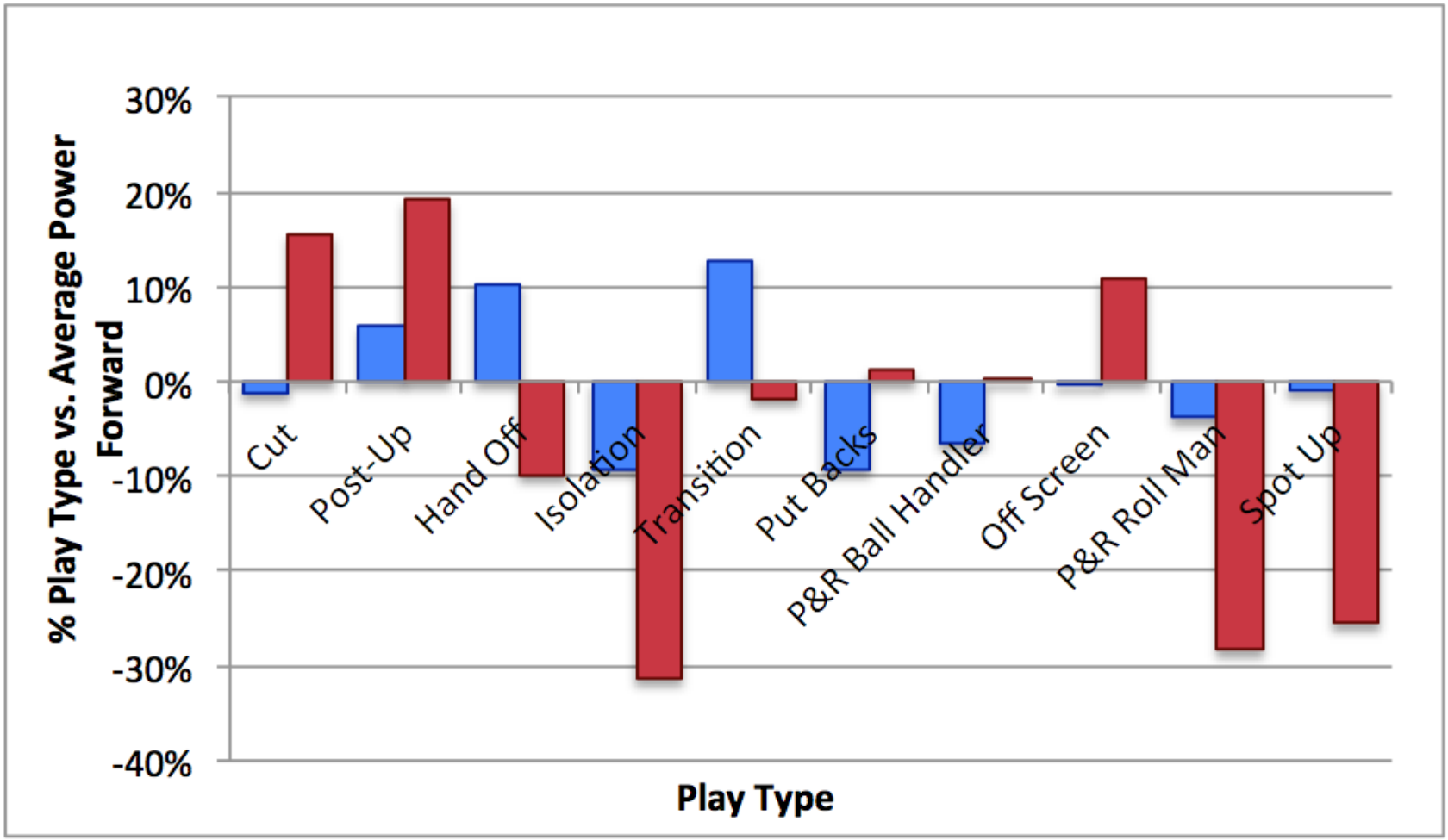
Bust SGs tend to come from teams that emphasize post up and don't spot up

Stars vs. Busts Team Play Type Differential - Small Forwards



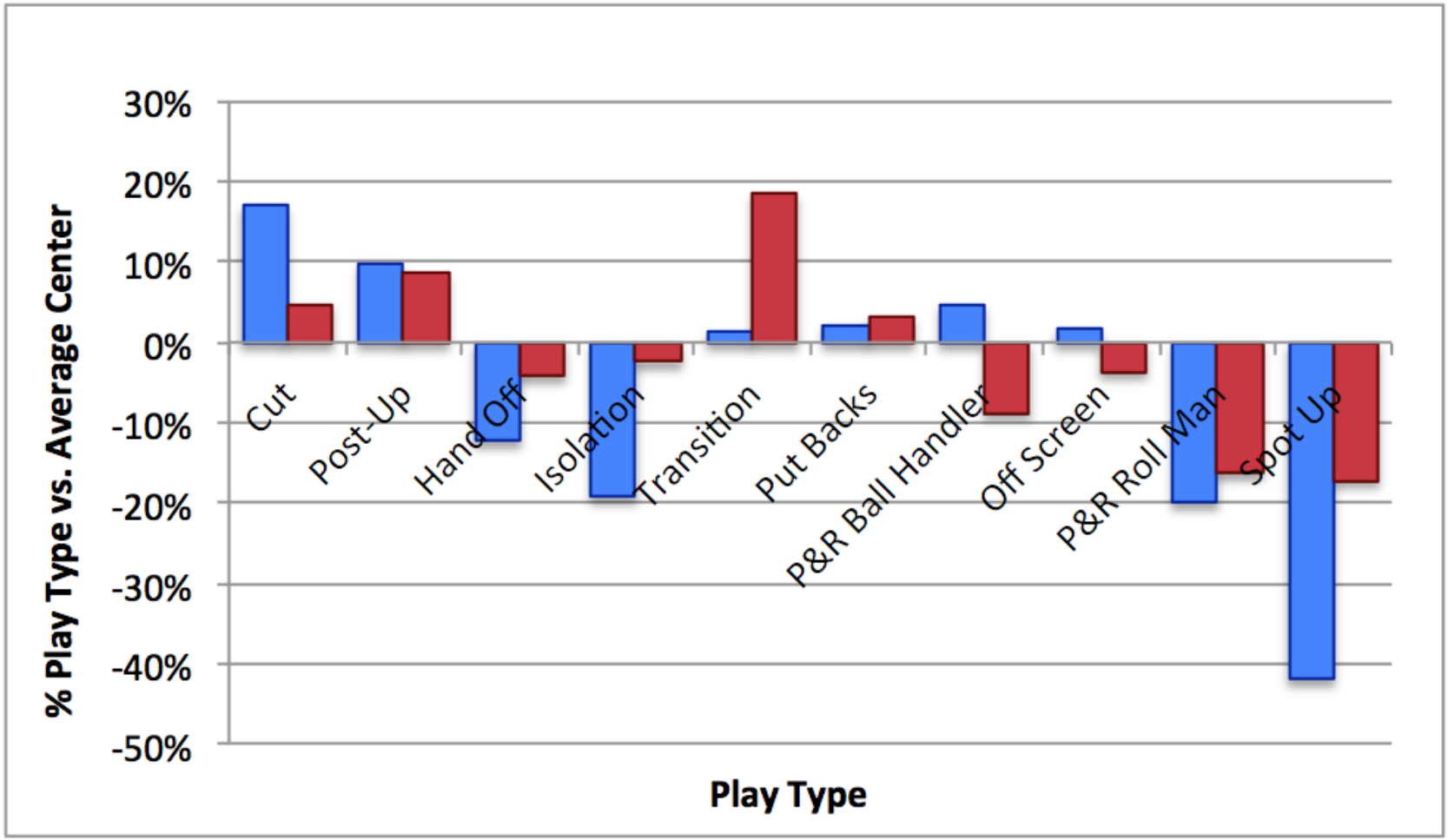
The proportion of isolation and spot-up plays differentiates star and bust SFs

Stars vs. Busts Team Play Type Differential - Power Forwards



Star PFs come from systems that de-emphasize isolation & spot-up shooting and emphasize post-up scoring

Stars vs. Busts Team Play Type Differential - Centers



Star Cs tend to come from teams that transition often, perhaps as a result of defensive play, and fewer P&R Ball Handler plays

Results & Conclusions

Thank you!

Questions?

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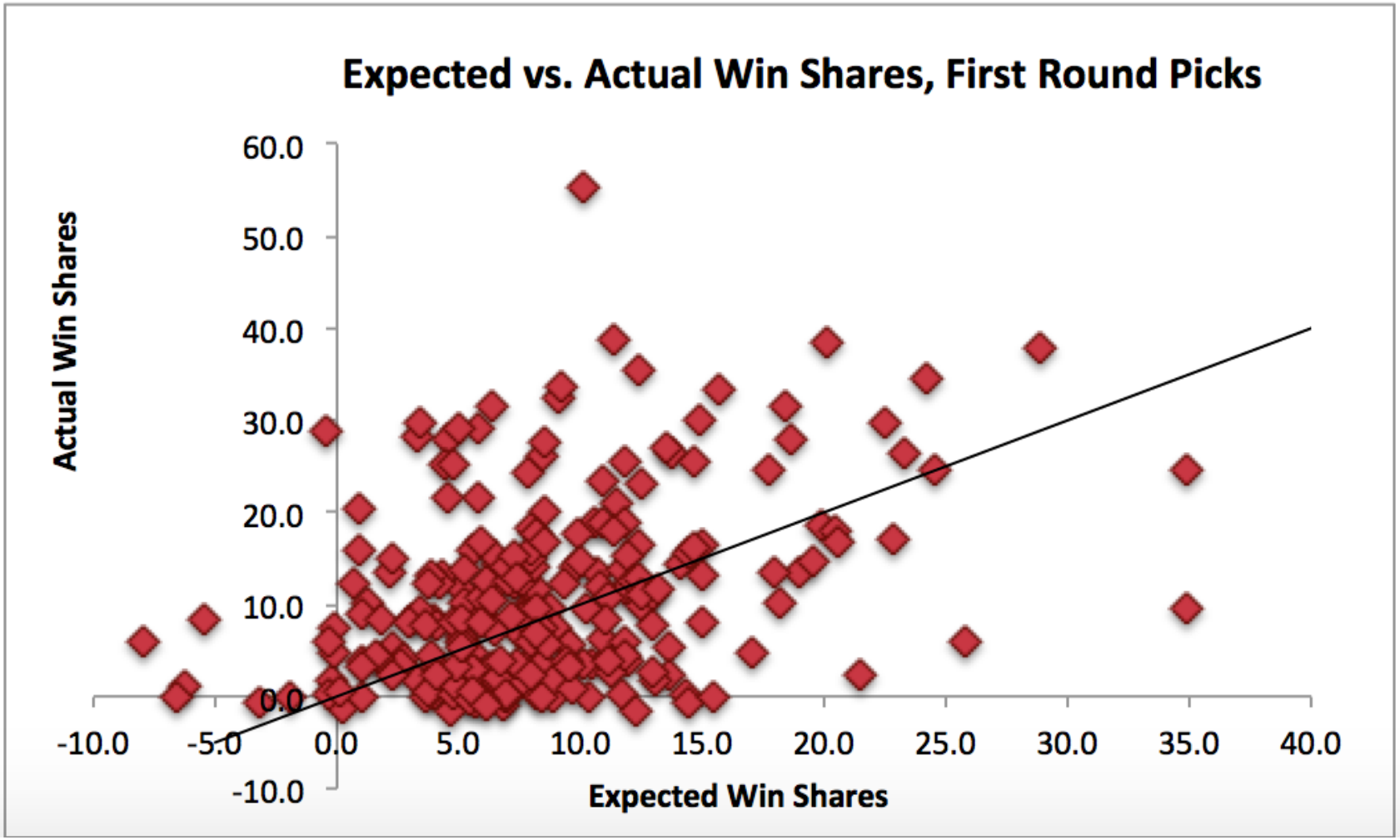
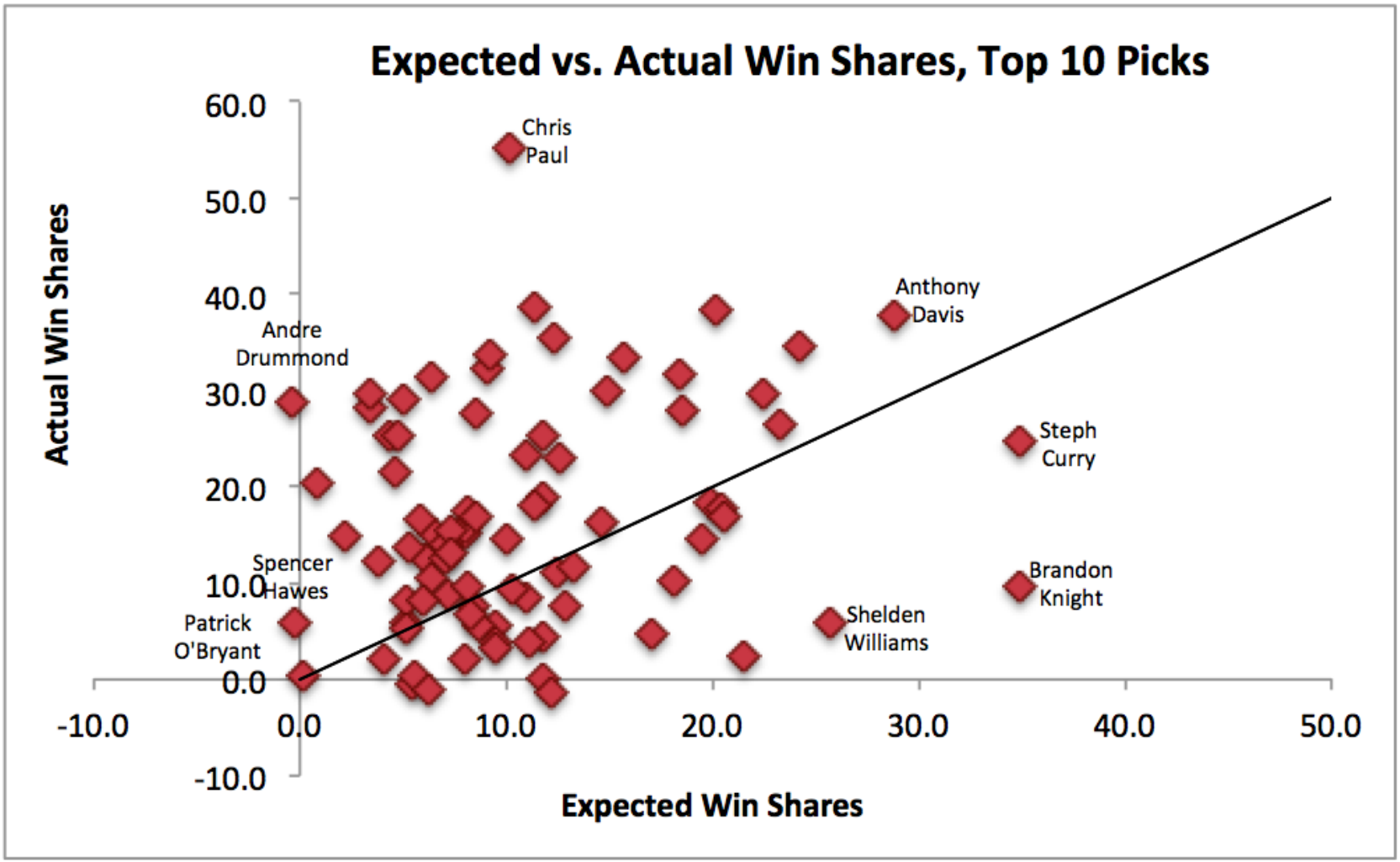
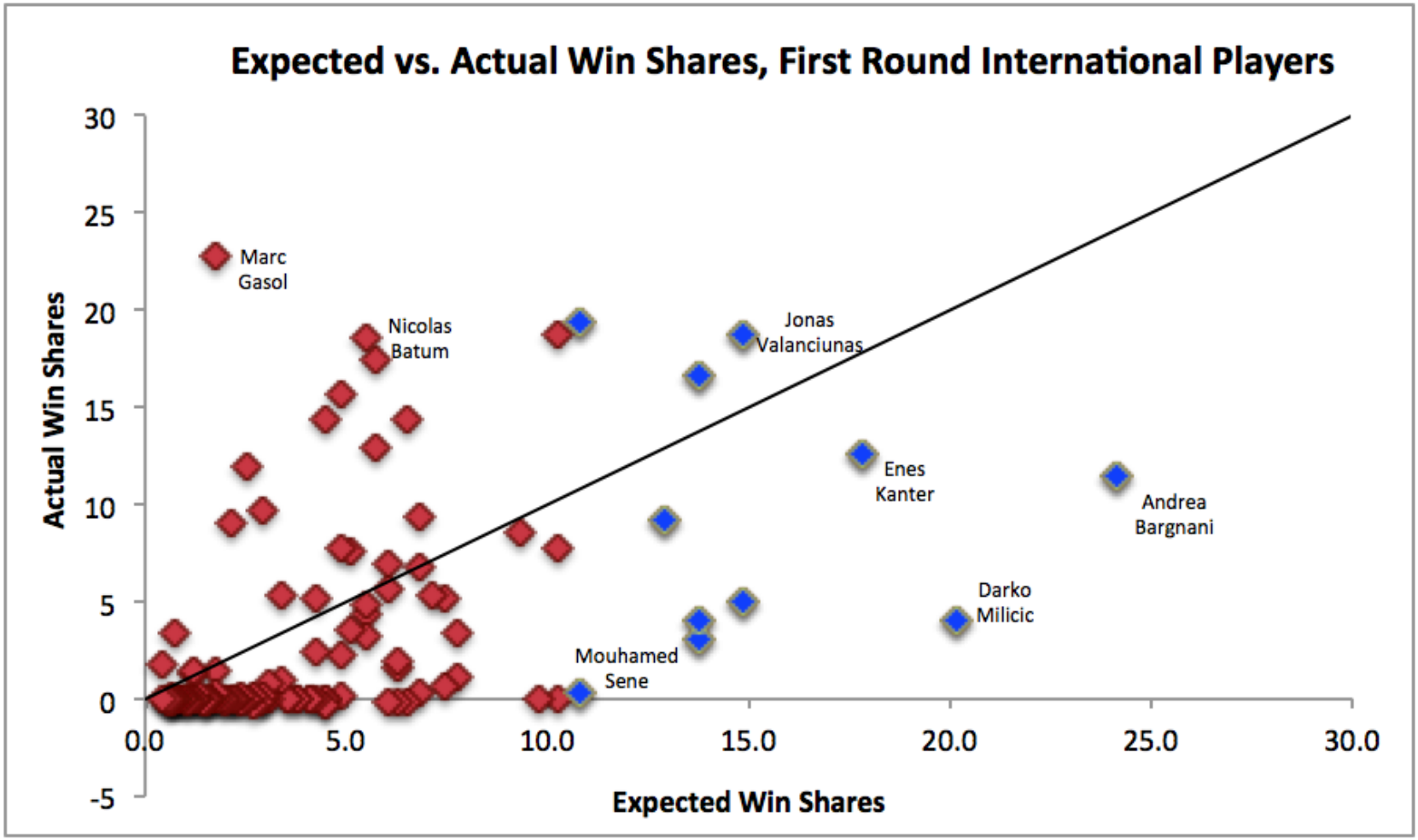
Appendix A: Actual vs. Expected WS – 1st Round



Appendix B: Actual vs. Expected WS – Top 10



Appendix C: Actual vs. Expected WS: International Players

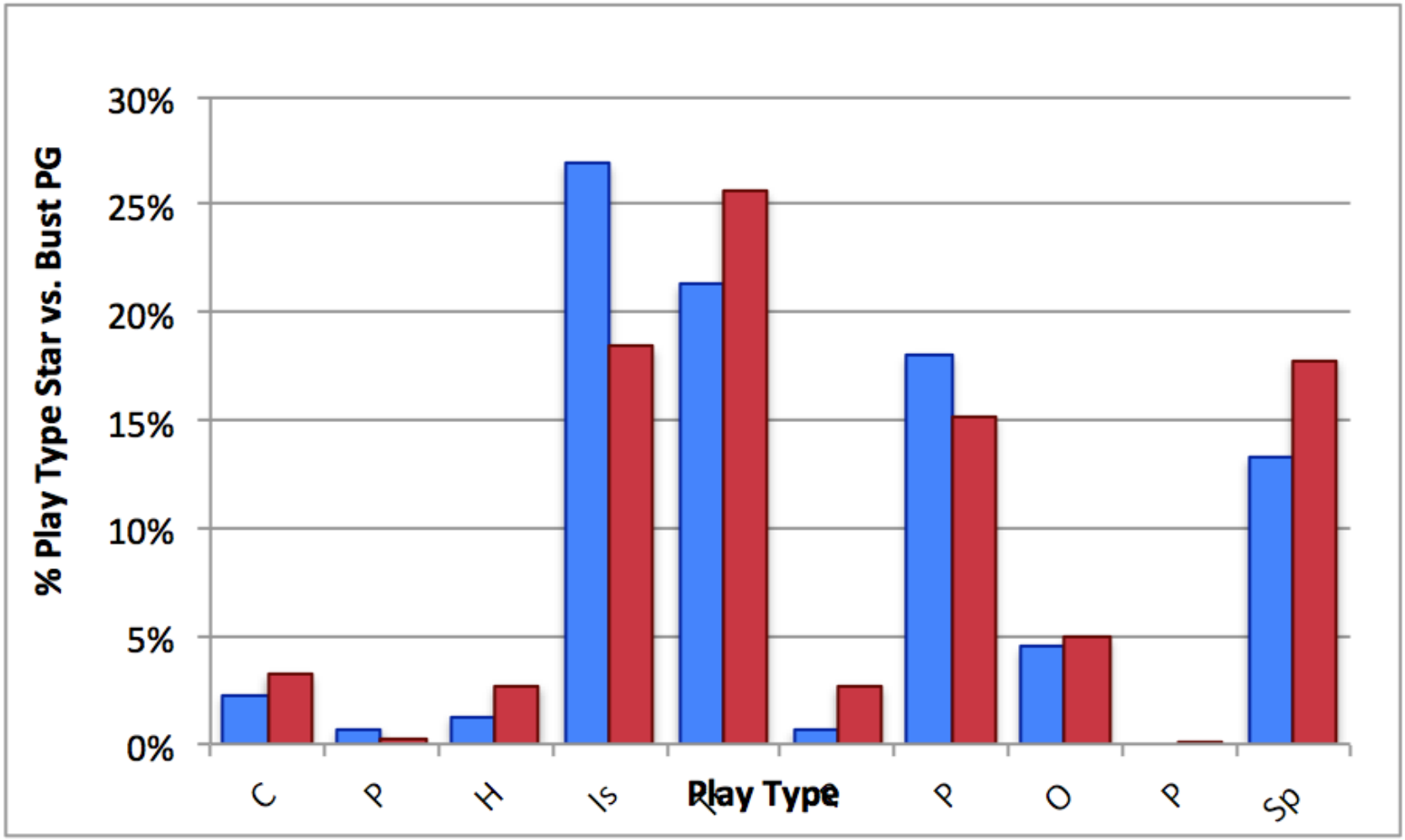


Appendix D: NCAA/Intl./HS Coach Comparison

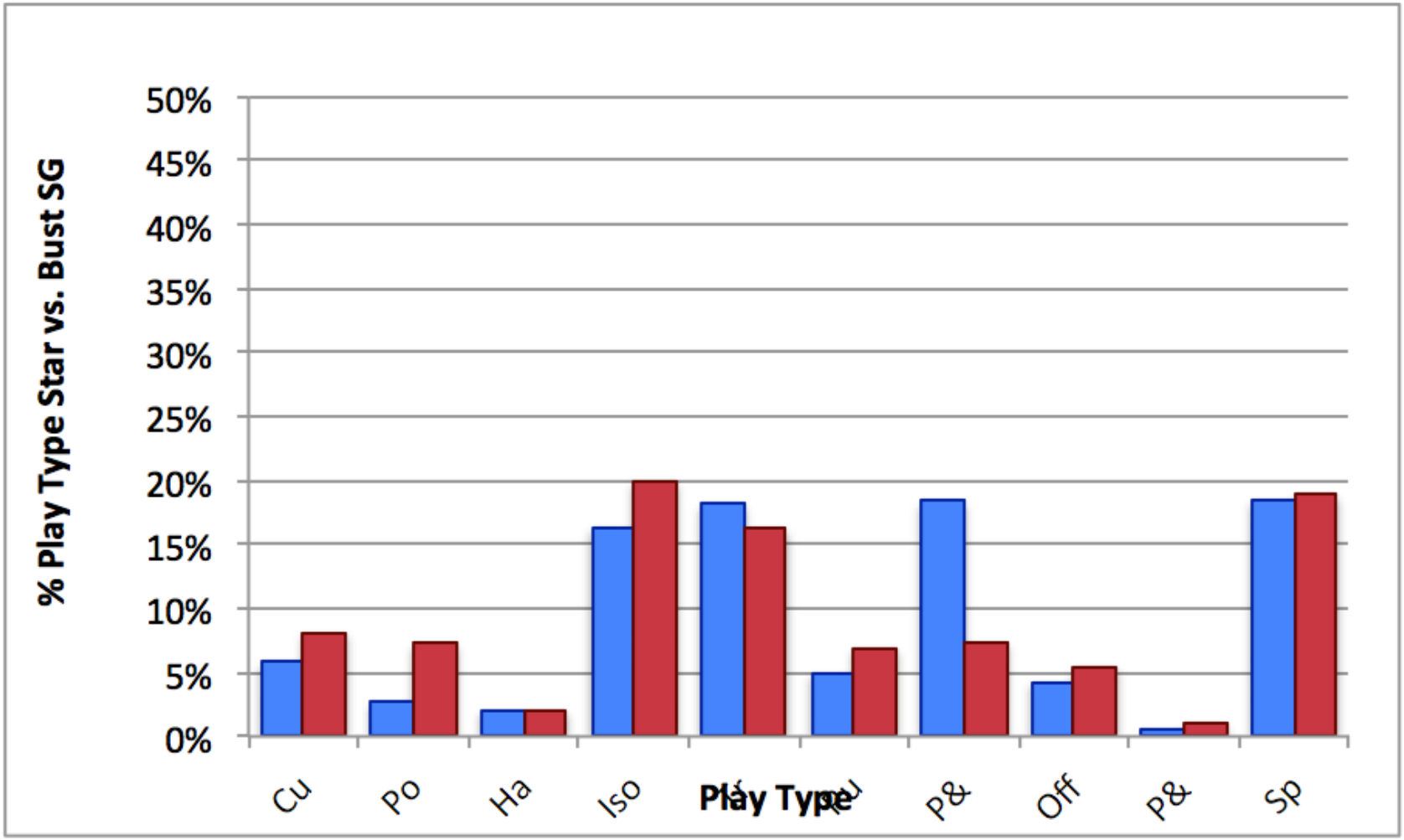
	μ_{WS}	σ_{WS}	$\mu_{E[WS]}$	95% CI of μ_{NetWS}
International	3.0	5.3	4.4	-1.3 $\pm$ 0.9
High School	9.3	12.6	8.2	1.1 $\pm$ 5.3
NCAA	7.3	9.0	6.4	0.9 $\pm$ 0.8
w/ Top Coach	8.1	9.1	7.6	0.5 $\pm$ 1.3
w/o Top Coach	6.6	8.9	5.4	1.2 $\pm$ 1.1

$$\mu_{NetWS} = \mu_{WS} - \mu_{E[WS]}$$

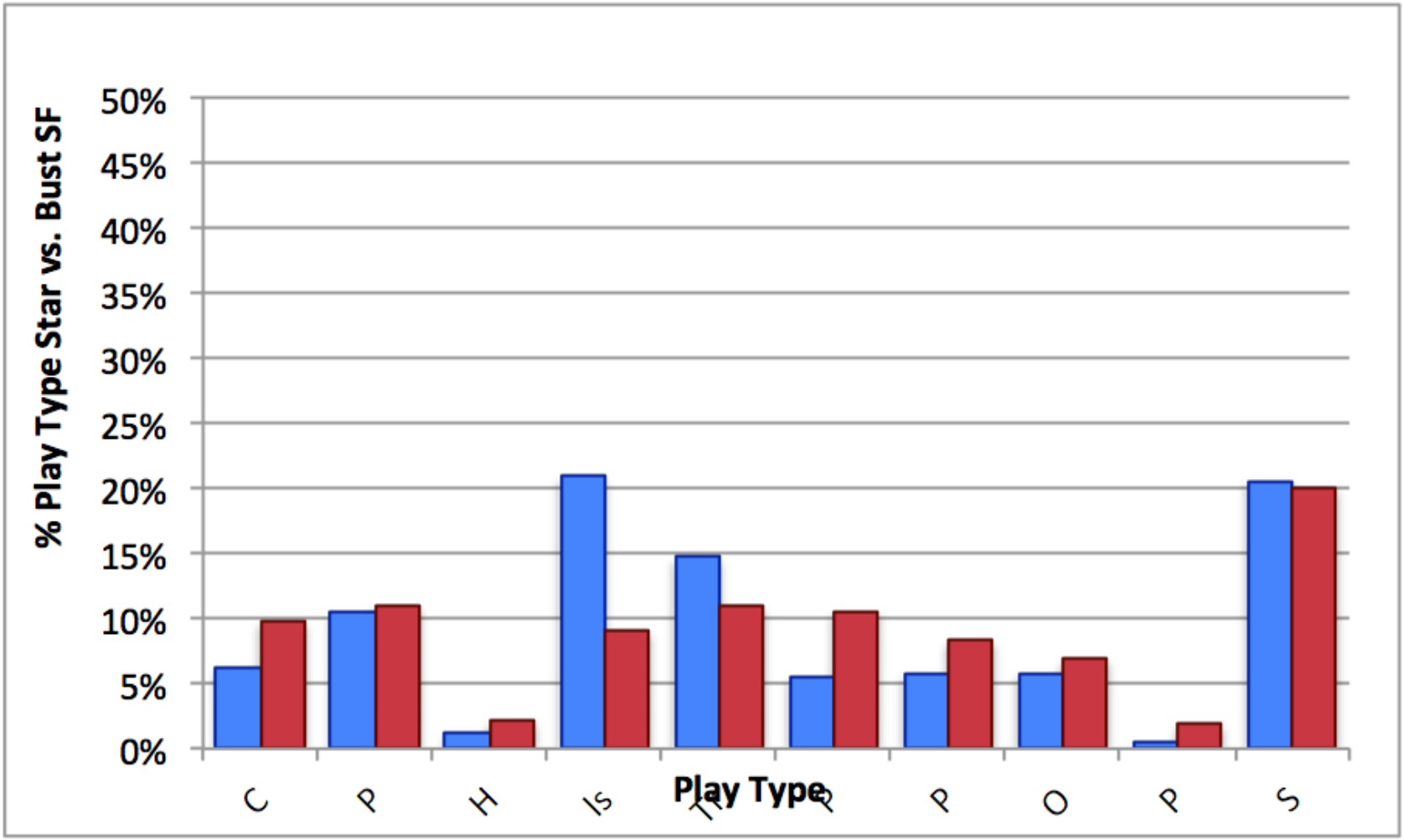
Appendix E: Stars vs. Busts Individual Play Type Differential - Point Guards



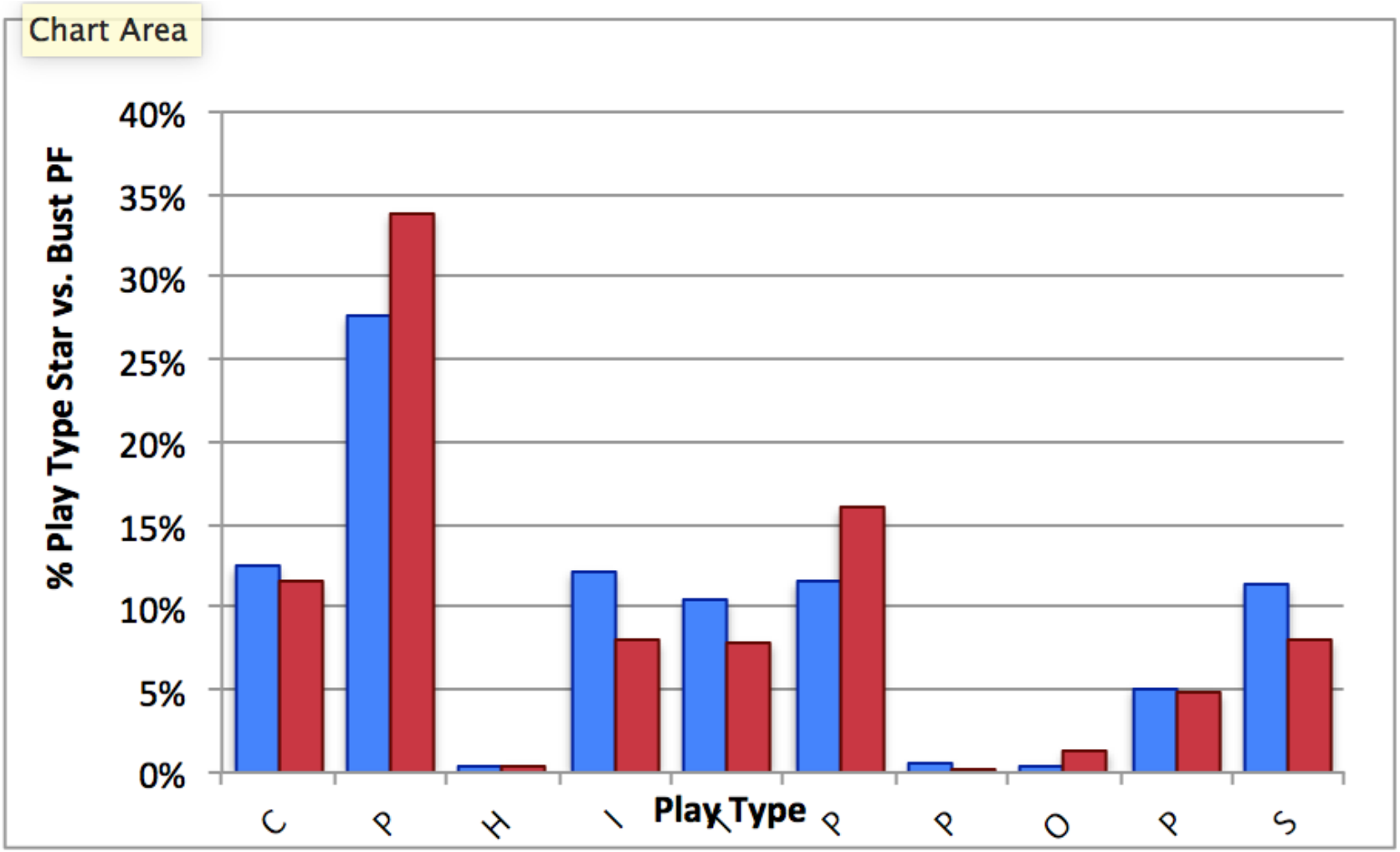
Appendix F: Stars vs. Busts Individual Play Type Differential - Shooting Guards



Appendix G: Stars vs. Busts Individual Play Type Differential - Small Forwards



Appendix H: Stars vs. Busts Individual Play Type Differential - Power Forwards



Appendix I: Stars vs. Busts Individual Play Type Differential - Centers