**What can we expect from John Lackey in 2016-2017?**

What follows is a brief analysis of John Lackey's FA years, using historical data as a comparable.

The Cubs paid $32 million for Lackey's 2 FA years. Assuming ~$8 million per WAR on the FA market, Lackey would need to produce 4 WAR for the Cubs to break even on the deal. (To simplify this analysis, let's ignore the value of the compensation pick the Cubs gave up.) What are the chances that Lackey hits 4 WAR over the next two seasons at ages 37-38?

The most straightforward analysis is descriptive, seen below.

Distribution of WAR in age 37 and 38 seasons
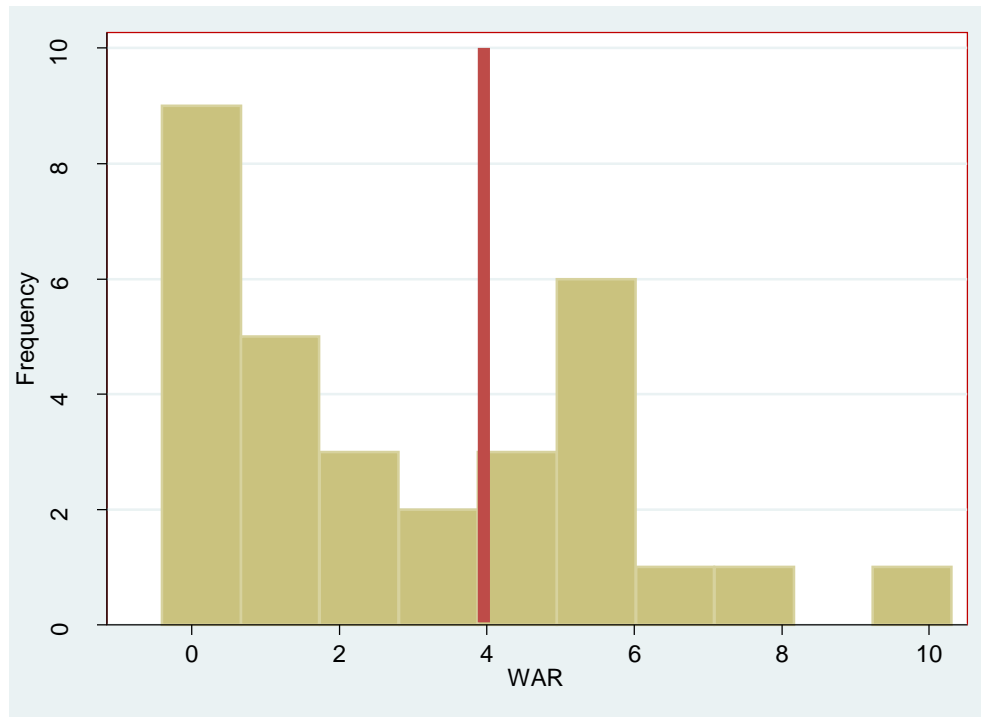
Using historical data, the chart above displays WAR in the age 37-38 seasons for the 43 SP with career WAR between 30-50 heading into their age 37 season. (Lackey has a career WAR of 39.7 to date) The red line at a WAR of 4 indicates the break-even point of the FA signing. Of the 43 eligible SP, only 14 had a future WAR over 4, which gives a ratio of ~32.5%.

For this deal to be labeled a "complete failure", let's set a low bar of a WAR of 1 over the next two seasons. Incidentally, 14 out of the eligible 43 SP had a future WAR under 1, giving us the same ratio of 32.5%. Using this first-level descriptive analysis, the odds do not look very good. But the Cubs are a smart franchise (as of late) – let's see if a fuller statistical analysis leads to the same story.

I ran a logistic regression with "success" defined as obtaining a WAR >4 for the age 37-38 seasons. I used as predictors the full suite of pitching data available in the fangraphs database. And the sample was restricted to the 43 SP with WAR between 30-50 heading into their age 37 season.

Using a logit analysis will all available predictors, Lackey had a predicted probability of "success" of *84.5%*. Now, predictions with data can be imprecise; the table below shows WAR in their age 37-38 seasons and their predicted probability of success using this logit model.

WAR in age 37 and 38 seasons

Pred	name	War
0.00109	Mike Flanagan	2.1
0.003494	Paul Splittorff	-0.1
0.005964	Harvey Haddix	2.6
0.007809	Scott Erickson	-1.2
0.010404	Bartolo Colon	2.8
0.014256	Jimmy Key	1.7
0.01595	Aaron Harang	0.8
0.021203	Bob Feller	0.1
0.027188	Scott Sanderson	0.8
0.027903	Tim Belcher	0
0.043712	Kevin Millwood	2.3
0.050685	Kevin Tapani	2.9
0.053129	Tom Candiotti	3.9
0.076619	Rick Sutcliffe	0.1
0.083161	Sonny Siebert	2.4
0.091972	John Burkett	4.5
0.108746	Al Leiter	3.9
0.123856	Joe Nuxhall	1
0.135863	Chris Carpenter	0.2
0.144398	Mark Langston	0.4
0.154286	Vern Law	1.4
0.162931	Tim Hudson	3.7
0.168481	Early Wynn	5.4
0.18797	Bob Welch	-0.1
0.23911	Jose Rijo	0.1
0.272906	Mike Cuellar	6.3
0.273469	Doyle Alexander	3.5
0.357189	Ron Guidry	0.5
0.397599	Dennis Martinez	5.7
0.415758	Jerry Reuss	0.5
0.501192	Chuck Finley	6.4
0.576603	Rudy May	3.5
0.662028	Jon Lieber	1.4
0.687638	Jim Perry	5.8
0.704623	Bob Lemon	-0.4
0.71153	A.J. Burnett	4.3
0.779763	Orel Hershiser	5.2
0.875586	Luis Tiant	5.2
0.940213	Jack Morris	5.4
0.942452	Jerry Koosman	5.9
0.953655	David Wells	7.9
0.988244	Phil Niekro	10.3
0.999378	Derek Lowe	4.3

The data suggests that Lackey, at a predicted probability of .845, should hold up reasonably well. While, at age 37, his upside will be limited (Niekro is the notable outlier at 10.3 WAR) the data suggests an outcome of ~4 WAR over his next two seasons is well within the realm of possibility. Given the Cubs reasonable payroll and need for another solid arm in the rotation, it's hard to find fault with the Lackey signing.