Premier League Spending and Success: Why David Moyes and Manchester United Form a Scary Combination

After 26 illustrious seasons in charge of Manchester United, Sir Alex Ferguson is now officially the former coach of perhaps the most famous club in the world. Fellow Scot David Moyes has quite a task in replacing the man who bossed United to 38 trophies, including 13 Premier League titles and 2 UEFA Champions League titles.

During Moyes' tenure at Everton, the club he will be leaving after 11 years in charge, he was renowned for stretching a tight transfer and wage budget into unpredicted success. Let's see if the data backed up Moyes' sterling reputation for getting the most out of a club on a restrictive budget.

I ran a regression using transfer and wage spending in the Premier League from 2007-08 to 2011-12, the past five seasons where complete data was available. To ensure accuracy in the model, I did two things: 1) I made each transfer and wage spending figure a proportion of the total spent in each year to counter inflation and 2) I added an interaction term, which was the product of these two proportions, in order to counter collinearity (adjusting for the fact that clubs that spend freely in the transfer market also pay their players higher wages).

The proportions along with the interaction term served as the independent variables. The dependent variables were points and goal differentials for the individual clubs in the English top flight during the time frame.

Models (remember that the spending data is represented in fraction form):

Points = 22.7 + 123 Proportion of League £ Spent on Transfers + 558 Proportion of League £ Spent on Wages – 1842 Interaction term

GD = – 47.5 + 219 Proportion of League £ Spent on Transfers + 890 Proportion of League £ Spent on Wages – 3033 Interaction term

The points model had an adjusted R-squared of around .65, and the goal differential model had an adjusted R-squared of .68. In other words, combined transfer and wage spending accounted for roughly 65-70% of the variation in points and goal differential between clubs in the past five Premier League seasons. The models are by no means a perfect representation of why clubs succeed (or fail to succeed), but it certainly points to the power of sheer spending in the top league of the world's favorite game.

Soccernomics, the 2009 book by Simon Kuper and Stefan Szymanski examining the beautiful game ran a similar regression and had an adjusted R-squared for a wages model of around .9. The two authors also went as far as to say the inclusion of transfer data in the model was over-fitting. The beginning of Chapter 3 of the book reads:

We studied the spending of forty English clubs between 1978 and 1997, and found that their outlay on transfers explained only 16 percent of their total variation in league position. By contrast, their spending on salaries explained a massive 92 percent of that variation. In the 1998-2007 period, spending on

salaries by clubs in the Premier League and the Championship… still explained 89 percent of the variation in league position. It seems that high wages help a club much more than do spectacular transfers. (http://tomkinstimes.com/2010/12/soccernomics-was-wrong-why-transfer-expenditures-matter/)

As the authors say, they used data from an older time period with a different sample of clubs (not just the Premier League). My adjusted R-squared is smaller due to my research including only the past five years of only the Premier League and possibly also due to the fact I accounted for all spending proportionally. From the more recent data, I found that including transfer spending only increased the adjusted R-squared of the model while keeping everything else significant.

For the statistical analysts out there, the highest P value in both models was a miniscule 0.011 for the transfer spending variable in each model, meaning it is quite unlikely indeed that transfer spending is not a significant factor in club performance (as anyone who follows soccer would undoubtedly expect).

Now that the models are set up, here comes the fun part: I measured value in spending through a residual, the difference between an observed value and a predicted value. Basically, it's a way to see just how much value was derived from the amount of money spent each year on transfers and wages. A positive residual means an "overachieving" season while a negative residual means an "underachieving" season relative to spending.

After analyzing the results of the models, it is clear that Moyes deserves all the plaudits he gets. Moyes was the head of the only club to best Sir Alex and Manchester United in getting the most value out of spending in the past five years. Now, he inherits the reigning the Premier League champions and the most popular club in the world – a scary thought.

In each of the past five years, Moyes has torn to shreds any middling expectations of his club based on their modest spending. This success came in both quantity and quality.

Here's a quick look at Everton's performance in the past five seasons:

Season	Transfer Spending	Wage Spending	Predicted	Actual
2007-08	£19 million	£44.5 million	45 points, -11 GD, 12th place	65 points, +22 GD, 5th place
2008-09	£17 million	£50 million	45 points, -12 GD, 12th place	63 points, +18 GD, 5th place
2009-10	£20 million	£54 million	48 points, -7 GD, 11th place	61 points, +11 GD, 8th place
2010-11	£1.5 million	£58 million	44 points, -14 GD, 15th place	54 points, +6 GD, 7th place
2011-12	£8 million	£63 million	52 points, -1 GD, 9th place	56 points, +10 GD, 7th place

Of the ten seasons that got the most value out of spending (as measured by residuals) during the past five years, Moyes is responsible for three in both points and goal differential. He especially outdid the goal differential predicted of his teams; the two highest residuals in that category belong to him. No other club during this time frame appears more than twice in the top 10 of either the points or goal differential residuals.

Ten seasons of best value – Points

Club	Season	Transfer Spending, Mil of £	Wages spending, Mil of £	Actual Points	Predicted Points	Residual (Observed – predicted)
Liverpool	2008-09	39	107.2	86	66.2	19.8
Everton	2007-08	19.25	44.5	65	45.6	19.4

Man United	2008-09	35.75	123.1	90	71.7	18.3
Everton	2008-09	17	49	63	44.9	18.1
Tottenham	2009-10	32	67	70	53.0	17
Blackburn	2007-08	3.8	39.7	58	41.9	16.1
Arsenal	2007-08	31	101.3	83	68.6	14.4
Man United	2007-08	61.75	121.1	87	72.6	14.4
Everton	2009-10	20	54	61	47.6	13.4
Liverpool	2007-08	69.75	90.4	76	63.2	12.8

Ten seasons of best value – Goal Differential

Club	Season	Transfer Spending, Mil of £	Wages spending, Mil of £	Actual GD	Predicted GD	Residual (Observed – predicted)
Everton	2007-08	19.25	44.5	+22	-10.4	32.4
Everton	2008-09	17	49	+18	-11.7	29.7
Liverpool	2008-09	39	107.2	+50	+22.7	27.3
Aston Villa	2007-08	16.25	50.4	+20	-7.0	27.0

Man United	2007-08	61.75	121.1	+58	+33.5	24.5
Tottenham	2009-10	32	67	+26	+2.1	23.9
Man United	2009-10	21	132	+58	+36.7	21.3
Everton	2010-11	1.5	58	+6	-14.1	20.1
Liverpool	2007-08	69.75	90.4	+39	+18.9	20.1
Fulham	2010-11	7.9	57.7	+6	-13.0	19.0

Moyes' Everton teams are at the same time brothers to the bottom spenders and the top finishers, an incredible money-saving, points-earning, goals-scoring apparatus. The average Premier League club over the past five years spent around £26.8 million on transfers, £66.2 on wages, and garnered 52 points with a goal differential of zero. Everton's average season over the past five years? £13.2 million spent on transfers, £53.7 million spent on wages, 60 points, a +13 goal differential, and an average finish of roughly 6th place. Moyes' Everton teams spent at a below average rate and won at an above average one. Think of the damage he can do with a budget like the one United has at its disposal.

Total residuals over the past five years (Table 3) show a clear distinction between the cream of the crop – those clubs led by Moyes and Ferguson – and the rest of the pack. Those two clubs are the only ones to have average points and goal differential residuals in the positive double digits. While a club like Chelsea was consistently underperforming in light of their massive spending, Moyes' Everton found a way to play its way into the top half of the table despite spending that more closely resembled those clubs dwelling near the relegation zone.

Table 3: Summary of club performance – 13 clubs to participate continuously in PL, 2007-08 to 2011-12

Club	Total Residuals – Points	Total Residuals – GD
Arsenal	19.8	30.5
Aston Villa	3.1	-3.0
Blackburn	16.6	-2.6
Bolton	-19.8	-21.7
Chelsea	-33.4	-51.0
Everton	70.1	110.8
Fulham	8.4	32.7
Liverpool	-0.9	12.4
Man City	9.7	10.3
Man United	52.4	67.5
Sunderland	-28.3	-31.0
Tottenham	19.9	33.9
Wigan	2.2	-19.0

Overall through the past five years, Everton has the best total residual of any of the 13 clubs to stay in the Premier League during that time frame, having beaten

the spending model by 70 points and nearly +110 on goal differentials. That means on average, Moyes (and whoever else was pulling the trigger in Everton's decision-making) delivered 14 marginal points and +22 marginal goal differential in each of the past five seasons. Looking at the average Premier League table, that's an incredible jump – the points difference between 1st and 4th, say, and the goal differential margin between 14th or 15th place and dead last.

Perhaps this says it best. There have been only two clubs to stay in the Premier League these past five years and never record a negative residual – in other words, outperform spending expectations every year. Those clubs? Manchester United and Everton, Moyes' past and future.

David Moyes, the only man to top Sir Alex these past five years in terms of value derived from spending, is fittingly the man who will replace him. Manchester United has lost the greatest Premier League manager of all time, and it might be foolish to think Moyes can fill the deified shoes of Sir Alex. But Manchester United now has in its employ the one manager in the Premier League who has consistently beat expectations to levels no other manager has. The numbers back up David Moyes' reputation as an outstanding manager, the most statistically worthy choice to follow in the footsteps of the great Sir Alex Ferguson.