



An analysis of the player transfer activity of each English Premier League club in the Summer 2019 Transfer Window to determine, based on quantitative measures, which club has been most successful

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1. So, how active have the EPL clubs been?

Following on from what was an exciting Premier League 2018/19 campaign, the Summer Transfer Window is a time where clubs make their preparations for the forthcoming season and fans hope that their team will be active bringing in new talent.

The window started off early with the big transfer (that had been a long time coming) being Eden Hazard finally leaving Chelsea to play in Madrid. However, due to their current transfer embargo they are yet to have the opportunity to utilise the capital that this transfer made available.

Two of the newly promoted teams have attempted to capitalise on the window being open with Aston Villa signing 13 players and Sheffield United signing five players (breaking their transfer record in doing so). Everton, Leicester and Wolves have all been active as well with each club signing at least three new players; Tottenham have bought players for the first time since the January 2018 window; whilst Liverpool have not made any notable signings.

2. The research headlines

- Arsenal and Newcastle have both overpaid when they each broke their transfer records by signing Nicolas Pepe for £72m and Joelinton for £39.6m respectively.
- Wolves have signed the star loan players from last season in Raul Jimenez and Leander Dendocker at prices that are below their respective **Intrinsic Values** (see explanation below). This is a similar situation to Everton signing Andre Gomes and Fabian Delph and Leicester obtaining Ayoze Perez.
- Some EPL clubs have completed some intelligent business this window with Norwich City making what could possibly be the steal of the summer.
- The intelligent business of the window continued through until the final day with Arsenal securing David Luiz's services to cover their Central Defender issues.

3. A little bit of science...

At Carteret Analytics we have developed the quantitative analysis utilised to good effect in investment banking for trading strategy, portfolio optimisation, derivatives pricing and hedging, and risk management by our sister corporate finance firm, Carteret Capital - and applied it to football.

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In particular, our work provides an objective measure of how good a football player really is - removing all the subjective noise and opinions.

An integral part of the analysis is to calculate a **Carteret Rating**³ for every football player, which rates and values a player's contribution to his team winning football matches. It is incredibly accurate at predicting a player's capabilities. Indeed, we always start with the premise that a professional football club's primary objective is to win matches - and therefore the more a player contributes to his team winning matches, the better the player.

Carteret Analytics has also extended the *Carteret Rating* to give each player an **Intrinsic Value** (in monetary terms). This is essentially the value of the player 'in use' - the monetary value of his contribution to his club winning football matches. It is a sophisticated financial calculation - utilising proprietary algorithms - and which can be applied to and by other clubs. This enables, for example, a prospective buying club to virtually (yet objectively) 'transplant' a player into its own team to determine his potential *Intrinsic Value* for the buying club. Once the prospective buying club has this information, it can help inform them of the appropriate transfer fee to offer to the player's current club.

4. Who bought players for more than their Intrinsic Value?

There have been notable transfers completed by clubs which are at a price that is more than 10% over their *Intrinsic Value* to the buying club. This is what we have classed as a notable overpayment for the predicted performance that the player will bring to the team.

The *Intrinsic Value* of Nicolas Pepe to Arsenal is **£50.23m**. The *Intrinsic Value* essentially represents a break-even position for Arsenal. This is the contribution they can expect Pepe to make to the Arsenal team. This is a higher *Intrinsic Value* than he held at Lille (**£19.31m**) because he is expected to have a higher impact at Arsenal.

This means that as Arsenal paid **£72m** for Pepe's services, they have overpaid by nearly **£22m**. Arsenal may argue that as he is only 24 years old, he has time to mature and come into his prime to prove that they have not overpaid for his services.

It is at this point that Lille should capitalise on the fact they have received a transfer sum that is in excess of **£50m** higher than his *Intrinsic Value* for the club by replacing him with a player that would have a higher *Intrinsic Value* for Lille than Nicolas Pepe, at a price that is lower than the sum they received so that they make a profit on this player trade.

There is a similar situation with Joelinton's arrival at Newcastle and McBurnie's arrival at Sheffield United. All three clubs mentioned here have broken their respective transfer records to acquire these players, with all three being shown to be questionable pricing decisions based upon the *Intrinsic Values* each player holds for their new club.

³ *Carteret Rating*: this is a proprietary method of determining how good a player really is. It is a significant and leading-edge algorithm. We assess a player by identifying every match in which he has been involved (for which we have data) and identifying the key events in each and every one of those matches. These Key Match Events ("KMEs") are events that led to a goal being scored; could have led to a goal being scored; led to a goal being conceded; or could have led to a goal being conceded. Then, for each and every KME, in each and every single match, we analyse that player's contribution to each of those KMEs. This is a substantial piece of analysis, and one which produces a unique *Carteret Rating* for the player. It is a dynamic rating, and it changes with each additional match played.

5. Who sold players for less than their Intrinsic Value?

In the same fashion as the clubs who overpaid for player, the science is the same for the clubs who have sold their players at an undervalue of more than 10% less than their *Intrinsic Value*.

The player that was sold for the largest amount lower than their *Intrinsic Value* to their new club, was Kieran Trippier from Tottenham Hotspur to Atletico Madrid. The *Intrinsic Value* he held for Tottenham in the 2018/19 season was **£61.27m** and the value he holds for his new club for the forthcoming season is higher at **£67.69m**.

Tottenham sold Trippier at an undervalue of over **£40m** when they allowed him to depart to join Atletico Madrid for **£19.8m**. As Trippier is already 28, meaning he is already at the prime age of his career (which is usually 26-30), his *Intrinsic Value* is at its peak. Therefore, Tottenham should have negotiated to increase the amount from Atletico to better reflect the loss of a player who's contribution to Tottenham winning football matches last season, and contribution to Atletico winning matches this coming season is so much higher than the transfer value.

Fabian Delph's transfer from Manchester City to Everton and Ayoze Perez's transfer from Newcastle to Leicester are both transfers that have been completed for values lower than their *Intrinsic Value*. They are in a similar situation to Trippier as they are both in their 'prime' with them being 29 and 26 respectively and have been sold at values **£35m** and **£13m** less than their *Intrinsic Values* to their new clubs.

6. Intelligent business

Norwich City obtaining the services of Sam Byram in the Summer Transfer Window is the steal of the summer. The transfer value for his transfer from West Ham to Norwich cost only **£747,000**. His *Intrinsic Value* at West Ham last season was **£27.69m** and although his value to Norwich is significantly lower at **£6.98m**, Norwich have still secured a player with Premier League experience for just above **10%** of his monetary value for contribution to Norwich winning football matches in the 2019/20 season.

David Luiz's switch from Chelsea to Arsenal on deadline day is a good deal for Arsenal. They paid **£7.83m** to cover their Central Defender issues after allowing Laurent Koscielny to leave earlier in the window to Bordeaux. His contribution to Chelsea winning football matches last season means he had an *Intrinsic Value* of **£32.85m** which has increased to **£34.8m** for the 2019/20 season at Arsenal.

Philip Billing's transfer to Bournemouth from Huddersfield and Tyrone Mings' transfer from Bournemouth to Aston Villa, are both examples of intelligent transfer business for Bournemouth. Bournemouth have acquired Billing for **£14.85m** which is less than **50%** of his *Intrinsic Value* to Bournemouth which is **£30.3m**. The sale of Mings to Aston Villa resulted in Bournemouth receiving **£20.07m** which is **125%** of his *Intrinsic Value* to Aston Villa which is **£15.52m**. This is a good decision as they have received an overpayment for a player with very limited Premier League experience.

7. Intrinsic Value - the data analysis of 'The good, the bad and the... average'

The table below highlights whether a team has had a good or bad Summer Transfer Window by showing the *Intrinsic Value* that each player holds for the selling club and buying club in contrast with the actual transfer value.

'Good Business' is defined as having a majority of transfers which the Club has either:

- purchased players for $\geq 10\%$ less than their *Intrinsic Value*; or

- sold players for $\geq 10\%$ more than their *Intrinsic Value*.

'Average Business' is defined as having either:

- a mix of Good Business and Bad Business; or
- purchasing/ selling players for values within 10% of their *Intrinsic Value*.

'Bad Business' is defined as having the majority of transfers which the Club has either:

- purchased players for $\leq 10\%$ more than their *Intrinsic Value*; or
- sold players for $\leq 10\%$ less than their *Intrinsic Value*

Good Business

Team	Arrivals	Departures	<i>Intrinsic Value to Selling Club</i>	<i>Intrinsic Value to Buying Club</i>	Transfer Value (Transfermarkt)
Bournemouth	Philip Billing	Tyrone Mings	£18.26m	£30.3m £15.52m	£14.85m £20.07m
Crystal Palace	Jordan Ayew	Aaron Wan-Bissaka	£4.67 £23.32	£23.94m £42.96m	£2.52m £49.5m
Wolves	Raul Jiminez Leander Dendocker			£43.37 £28.28	£34.2m £12.15m

Average Business

Team	Arrivals	Departures	<i>Intrinsic Value to Selling Club</i>	<i>Intrinsic Value to Buying Club</i>	Transfer Value (Transfermarkt)
Brighton	Adam Webster Neal Maupay		£5.73m £5.67m	£21.81m £25.17m	£19.67m £18m
Everton	Andre Gomes Fabian Delph Moise Kean Alex Iwobi	Ademola Lookman Idrissa Gueye	£54.58m £25.67m £46.26m £13.32m £53.03m	£40.9m £44.43m £20.79m £45.92m £13.82m £60.56m	£22.5m £8.55m £24.75m £27.36m £16.2m £27m
Leicester	Ayoze Perez Youri Tielemans	Harry Maguire	£37.83m £49.35m	£42.98m £36.95m £73.36m	£30.06m £40.5m £78.3m
Manchester United	Aaron Wan-Bissaka Harry Maguire Daniel James		£23.32m £49.35m £3.08m	£42.96m £73.36m £28.45m	£49.5m £78.3m £15.3m

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Bad Business

Team	Arrivals	Departures	<i>Intrinsic Value to Selling Club</i>	<i>Intrinsic Value to Buying Club</i>	Transfer Value (<i>Transfermarkt</i>)
Arsenal	Nicolas Pepe William Saliba David Luiz	David Ospina Laurent Koscielny Alex Iwobi	£19.31m £6.18m £32.85m £24.82m £46.26m	£50.23m £18.59m £34.8m £26.2m £45.92m	£72m £27m £7.83m £3.15m £4.5m 27.36m
Newcastle	Joelinton Allan Saint-Maximin	Ayoze Perez	£18.05m £37.83m	£25.75m £20.47m £42.98m	£39.6m £16.2m £30.06m
West Ham	Pablo Fornals Sebastien Haller	Marko Arnautovic Sam Byram Pedro Obiang Reece Oxford	£18.77m £29.65m £37.48m £27.69m £20.58m	£26m £40.62m £6.98m £8.67m £8.39m	£25.2m £36m £22.5m £747,000 £7.2m £1.8m

Once again, these *Intrinsic Values* place a monetary value on each player's contribution to their respective teams winning matches in the Premier League, and these *Ratings* are dynamic and change with each game they play.

About Carteret Analytics

Carteret Analytics is part of the Carteret Group of companies, based in the City of London, New York and Geneva. It provides leading-edge quantitative analysis and commercial analytics to clients worldwide, with particular expertise in the sports sector. In football our work includes player rating and valuation, head coach assessment, team performance analysis, and applying proprietary analytics to transform commercial revenues.

Further information and contact details

If you have any questions, or would like to enquire about further services provided by the Carteret Group, then please feel free to contact one of the team members listed below. We would be delighted to hear from you and discuss our work in more detail.

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