CarteretAnalytics

BBC Sport website feature: *Carteret Ratings* and *Intrinsic Values* for select Manchester United players

James Powell[1], Christopher Brain[2]

1. The headlines

- Notwithstanding the significant amount of criticism directed towards Manchester United's recruitment policy since the end of the Sir Alex Ferguson era, the quantitative analysis indicates that the Club has not necessarily over-spent on players - at least in comparison to the *Intrinsic Value* that Manchester United receives from those players (in terms of their contribution to the team winning matches).

- **However, the recruitment at Manchester United does appear to lag behind other teams in extracting optimal value for the money spent on player transfer fees.** The Club should be looking to achieve higher *Intrinsic Values* from its key players than the transfer fee paid for that player. The reasons for this disparity could be poor recruitment, poor performances by some of the players (playing below their optimal levels), or poor team management/coaching - or, most likely, a combination of all three.

- Interestingly, the individual data in the table in Section 4 indicates that Manchester United might have got excellent value for **Bruno Fernandes**, with Transfermarkt reporting an [initial] transfer fee of **£49.5m** and an *Intrinsic Value* of **£82.15m** for Manchester United.

- **Daniel James** looks like he represents good value in terms of his *Intrinsic Value* (**£44.69m**) vs his acquisition cost **(£15.3m)**, but his *Intrinsic Value* is not particularly high compared to some of his team mates, and what Manchester United might expect from a player in his position in the Premier League.

- In relation to the Summer signings of **Harry Macquire** and **Aaron Wan-Bissaka**, the individual data shows that they are essentially holding their acquisition value - but nothing more.

- Notably, **Victor Lindleof** has an *Intrinsic Value* to Manchester United of **£67.05m,** whilst his acquisition fee was **£31.5m.** This highlights the improvement that has been made and that **Lindleof** is now starting to show good value for the club from his objective performance levels this season. In a similar vein, **Fred** is also starting to show good value to Manchester United through his performances with an *Intrinsic Value* to the club of **£74.44m** after an acquisition cost of **£53.1m**; and, to a slightly lesser extent, **Martial** and **Shaw** are also now starting to demonstrate a return on their investment.

2. 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.

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

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[1] James Powell, Chief Executive Officer - Carteret Group, London. T: +44 20 3876 2414. E: jpowell@carteret.group

[2] Christopher Brain, Corporate Analyst - Carteret Group, London. T: +44 20 3876 2414. E: cbrain@carteret.group

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.

3.   Side Note: The distinction between *Carteret Rating* and *Intrinsic Value*

Carteret Rating
This is a completely objective measure. It only takes account of a player's performance metrics, and analyses these metrics utilising a proprietary algorithm to determine how good a player really is - and predict how he will perform in the future.

It ignores characteristics such as age and nationality, and avoids the 'noise' of subjective considerations that are often taken into account (often wrongly) in trying to determine the quality of a player.

It is an exceptionally accurate rating, with an *r-squared value* of **0.89** for Premier League players - demonstrating that it is very precise at predicting how good a player will be in the future. It is also a dynamic measure, allowing us to accurately predict the impact of the player in different clubs and different leagues.

Intrinsic Value
This is a proprietary monetary measure of the player's objective performance. In other words, it monetises a player's *Carteret Rating*.

It is incredibly useful to a club because it allows them to compare a player's intrinsic value to his market value. For instance, if a player's *Intrinsic Value* is £10m and a club is offering £20m to buy him, then this would strongly suggest that his current club should sell him.

Of course, if you are the buying club then you will also benefit enormously from an insight into what that player's *Intrinsic Value* might be if he were to join the buying club. If his *Intrinsic Value* for the buying club is £25m, then it suggests that a purchase price of £20m also offers good value for the buying club.

This also illustrates that a player's *Intrinsic Value* can vary between clubs. It is obvious that this should be the case because the context for valuing that player will be different at each club - the quality and performance levels of the other players at the other club, the quality and performance of the coaching

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[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.

staff, the 'best fit' analysis of that player into preferred and optimal formations at the other club, the league and league position of the other club, the player's projected value as an intangible asset as part of the enterprise/corporate value of the other club, the cost/benefit analysis (including opportunity cost) of the other club with and without that player etc.

It is important to note that it is unlikely that both clubs - the selling and buying club - will have access to the *Carteret Rating* or *Intrinsic Value*. This provides a substantial competitive advantage to the club that does have access to these measures, because it will help that club successfully negotiate the best possible price for the player whilst ensuring (in the case of the selling club) that the player is not sold for a price lower than his *Intrinsic Value* to the selling club; or (in the case of the buying club) that the player is bought for a price lower than his *Intrinsic Value* to the buying club.

4.   The List: *Carteret Ratings* and *Intrinsic Values* for each player

The table below provides the *Carteret Ratings* and *Intrinsic Values* for each of the Manchester United players identified by the BBC for analysis:

Player Name	Current Club	Carteret Rating 2019/20	*Intrinsic Value (2019/20) £*	Estimated Acquisition Cost (Transfermarkt) £
Juan Mata	Manchester United	167.8	24.77	40.26m
Luke Shaw	Manchester United	211.4	46.81m	33.75m
Marcus Rojo	Manchester United	101.9	22.56m	18m
Anthony Martial	Manchester United	304.4	67.4m	54m
Paul Pogba	Manchester United	348.6	85.76m	94.5m
Victor Lindelof	Manchester United	286.9	67.05m	31.5m
Romelu Lukaku	Inter Milan	333.8	82.12m	76.23m
Nemanja Matic	Manchester United	236.2	34.87m	40.23m
Alexis Sanchez	Inter Milan	79.7	11.76m	30.6m
Diogo Dalot	Manchester United	44.2	7.07m	19.8m
Fred	Manchester United	302.6	74.44m	53.1m
Daniel James	Manchester United	242.2	44.69m	15.3m
Aaron Wan-Bissaka	Manchester United	262.4	48.21m	49.5m
Harry Maguire	Manchester United	310.0	76.26m	78.3m
Bruno Fernandes	Manchester United	351.5	82.15m	49.5m

5.   BBC Sport article

The BBC Sport article which utilised the information and insights provided in this Research Paper can be found at:

https://www.bbc.co.uk/sport/live/football/51355825

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.

James Powell - CEO, Carteret Group
E: jpowell@carteret.group - T: +44 20 3876 2414

Christopher Brain - Corporate Analyst, Carteret Group
E: cbrain@carteret.group - T: +44 20 3876 2414