



INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Equity Valuation of Manchester United plc

João Gonçalo dos Reis Afonso e Castro Mascarenhas

Master's in finance

Supervisor:

PhD, Pedro Manuel de Sousa Leite Inácio, Assistant Professor
Iscte-lul

October, 2023



BUSINESS
SCHOOL

Department of Finance

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Resumo

Manchester United é um clube de futebol com sede em Manchester e tem estado na vanguarda do futebol desde o início dos anos noventa. Compete na Premier League, a liga de futebol mais competitiva e lucrativa da indústria. O clube é propriedade da família Glazer, conhecida pelos adeptos como "Os Glazers", que detêm 70% das ações. Está na bolsa de valores desde 2014 e tem distribuído um dividendo anual estável de 0,18 dólares nos últimos 5 anos, com um rendimento de cerca de 1%.

Foi considerado pela Deloitte, no seu relatório anual sobre futebol, como o quarto maior clube de futebol do mundo. Tinham uma presença nas redes sociais, em 2020, de 141 milhões de pessoas, uma média de assistência de 74 mil pessoas por jogo e geraram cerca de 309 milhões de libras em receita comercial em 2022.

O objetivo desta tese foi emitir uma recomendação de compra ou venda das ações, a 28 de abril de 2023. Para o fazer, o método aplicado foi o Free Cash Flow to the Firm. Foi também implementada uma abordagem adicional, e embora não tenha sido convencional, o objetivo foi tentar superar alguns dos problemas típicos enfrentados ao tentar valorizar clubes desportivos, inovando na abordagem adotada, bem como dar alguma confirmação aos resultados do nosso modelo FCFE.

A nossa recomendação final é que os investidores devem vender as ações do Manchester United.

Palavras-chave: Manchester United; Avaliação de Empresas; Futebol; Cash Flow; Múltiplos **JEL Classification:** G300 – Corporate Finance; G32 – Value of Firms

Abstract

Manchester United is a football club based of Manchester and has been at the forefront of football since the early nineties. It competes in the English Premier League, the most competitive and lucrative football league. The club is owned by the Glazer family, known by the supporters as “The Glazers”, who own 70% of the shares. It has been listed in stock exchanges since 2014 and has been paying a stable annual dividend of 0.18\$ for the last 5 years, with a yield of around 1%.

It has been considered by Deloitte, in their annual football report, as the fourth largest football club in the world. They had a social media following, as of 2020, of 141 million people, an average league attendance of 74 thousand people a game and have generated about 309 million pounds in commercial revenue in 2022.

The purpose of this thesis was to issue a buy or sell recommendation of the shares, as of 28th of April 2023. To do so, the method applied was the Discounted Cash Flows Multiples. An extra valuation approach was also implemented, and although it was not a conventional one, the goal was to try and surpass some of the typical problems that are faced when trying to value sports clubs, by innovating in the approach taken, as well as to give some confirmation to our DCF model’s results.

Our final recommendation is that investors should sell the shares of Manchester United.

Keywords: Manchester United; Firm Valuation; Football; Discounted Cash Flow; Multiples
JEL Classification: G300 – Corporate Finance; G32 – Value of Firms

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1.Introduction

The last few years have been challenging, with Covid-19 hitting everyone and everything in a way that had no parallel in recent memory. The world of football did not escape this reality, and the last two years have been full of challenges to even the biggest and richest clubs, both sporting challenges and financial challenges.

Manchester United is an English football club, founded in 1878, they have won more domestic titles than any other English club and have conquered the football world in whatever metric that one could think of. They are currently owned by the Glazer family, which holds 70% of the shares, and they hold even more power when it comes to voting rights. Their current market capitalization exceeds two billion euros, and they are considered one of the four largest football clubs in the world.

The main goal of this master thesis is to estimate the target price per share of Manchester United plc, as of 28th April 2023, reaching, in the end, a buy or sell recommendation based on the result achieved. Through a comprehensive literature review, this work aims to be able to reach a valuation that relies on established principles, that have been studied and documented, while also trying to incorporate some new ideas and innovations. This will empower us with results that we can use to try and reach a complete conclusion, something that has been proven to be complex when valuing sports clubs and franchises.

The first step, as was mentioned before, is to perform a robust literature review, that will then guide us in the second part of this work, an overview of the football world, as well as an analysis so that we can understand where Manchester United fits in the overall picture.

Only then will we have all the pieces necessary to build models and create assumptions that truly reflect not only our company, but also its surrounding environment, and this will be the final step in this thesis, reaching a conclusion that can provide us with not only accurate results but also, hopefully, bring forth some interest findings in the art of valuation applied to football clubs.

Finally, it is important to mention that the work ahead is a Master Project and not a Dissertation, delving into more practical issues and situations, and not so much directed to research.

2.Literature Review

2.1. Introduction to Valuation

Valuation is the key to successful investing and managing any asset, by understanding not only its value but also the sources of said value (Damodaran, 2012). The author defends that valuation is neither a science nor the objective search for true value, that some make it out to be, due to the human bias that goes into this process.

Professor Pablo Fernández delves further into this topic, stating that the most common errors are related to blindly following formulas, setting common sense aside (Fernández, 2004).

2.2. Valuation Methods

The methods for valuing companies can be classified in six groups: Balance Sheet (Book Value; Liquidation Value; Substantial Value), Income Statement (Multiples: PER; P/EBITDA), Cash Flow Discounting (Equity Cash Flow; Dividends; Free Cash Flow; APV), Value Creation (EVA; Economic Profit; Cash Value Added; CFROI), Options and Mixed Methods (Fernández, 2004).

To reach a fair and comprehensive valuation of Manchester United plc, we will deploy the Discounted Cash Flow Valuation Methods and Relative Valuation using Multiples.

2.3. Discounted Cash Flow Valuation Methods

The idea behind discounted cash flow valuations is the basis for many other valuations and anyone that understands this approach will be able to use the other methods. Damodaran classifies this approach in two different ways: firm valuation and equity valuation (Damodaran, 2012). This approach has in its foundation the present value rule, which states that the value of any asset is the present value of the expected future cash flows:

$$Value = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t} \quad (1)$$

Where:

n = life of the asset; CF = Cash Flow in period t; r = discount rate

2.3.1. Firm Valuation

This model consists of discounting the FCFF (Free Cash Flow to the Firm) at the WACC. The FCFF is the sum of the cash flows to all of those that have a claim in the firm, both debt claims,

and equity claims. This is often referred to as the unlevered cash flow since this cash flow is recorded before debt payments (Damodaran, 2012).

$$FCFF = EBIT (1 - t) + Depreciation \text{ and } Amortization \text{ Costs} \quad (2)$$

$$- Capital \text{ Expenditure} - \Delta Working \text{ Capital}$$

Establishing the FCFF is only the first step of this process, then we define an important factor to proceed with our analysis, and that is related to our expectations regarding the stability of future growth. A stable growth rate of the FCFF can be assumed, which allows us to value firms with the following formula, where g is the assumed growth rate.

$$Value \text{ of } Firm = \frac{FCFF_1}{WACC - g} \quad (3)$$

According to Damodaran (Damodaran, 2006), two conditions must be met when using this model. The first one states that the growth rate used in the model needs to be less than or equal to that of the economy, with the detail that nominal growth should be used if the cost of capital is in nominal terms and the real growth rate should be used if the cost of capital is in real terms. The second one refers to the consistency of the stable growth assumption, stating that the reinvestment rate to estimate free cash flows should be consistent with the stable growth rate, furthermore, it is implicit that the debt ratio of the firm will be constant over time.

However, there is another method to reach the valuation of a firm, where we consider that for the first n years, we discount the FCFF of each year at the WACC, until we reach a year where we believe that the company starts growing at a stable growth rate, and only then will we use the stable growth rate to value the business in perpetuity, as Damodaran states (Damodaran, 2006).

$$Enterprise \text{ Value} = \sum_{t=1}^n \frac{FCFF_T}{(1 + WACC)^t} + \frac{Terminal \text{ Value}}{(1 + WACC)^t} \quad (4)$$

$$Terminal \text{ Value} = \frac{FCFF_n(1 + g)}{(WACC - g)} \quad (5)$$

In this method, we can observe that the Terminal Value is identical to the formula we used in the beginning to value a firm that has a constant growth rate from year one, the only difference is that now we start valuing at year n , and all prior cash flows are valued individually, as it can be seen in the Enterprise Value formula. Damodaran also elaborates on another way to address

the Terminal Value (Damodaran, 2012), where one would assume that the firm's assets would be liquidated in the terminal year.

2.3.1.1. Cost of Equity

The cost of equity matches the return investors demand on their investment and added to a premium, represented by the excess return of the market against the risk-free rate, showcasing the risk level of said investment. The Capital Asset Pricing Model (CAPM) is the most common method to compute it, Goedhart et al. (2010). In this model, the cost of equity will depend on the following parameters: risk-free rate, the beta, and the market risk premium (Goedhart et al., 2010):

$$K_E = r_f + \beta * (r_m - r_f) \quad (6)$$

With:

r_f = risk free rate;

r_m = expected return of the market;

β = stock's sensitivity to the overall market returns.

Regarding the risk-free rate, we can say an asset has no risk, or is risk free, when we know its expected return with a great degree of certainty and two conditions need to be met, the asset must not have the risk of defaulting and it needs to be safe to reinvest in it in the future. Government issued debt is generally viewed as a risk-free asset if the government is reputable. Given that Manchester United is an UK company, we will use the UK 10-year zero coupon bond rate as the risk-free rate in our valuation.

The Beta captures the market risk of an asset and represents its sensitivity to the market, usually represented by an index. Damodaran (2002) shows that Beta can be computed "by dividing the covariance of each asset with the market portfolio by the variance of the market portfolio", with the following equation:

$$\beta_x = \frac{Cov_{x,m}}{\sigma_m^2} \quad (7)$$

With:

$Cov_{x,m}$ = covariance between the asset and the market (index).

σ_m^2 = Variance of the market (index).

Finally, the Market Risk Premium (MRP) is computed as the difference between the expected return of the market, by looking at an index that captures its past performance, and the risk-free rate.

2.3.1.2. Cost of debt

The cost of debt is another component of the WACC and represents the effective cost that a company bears by financing itself with debt. Interest expenses are, normally, tax deductible, so the after-tax cost of debt concept encompasses the benefit of using borrowed assets instead of owned assets.

When obtainable, the best proxy is the yield-to-maturity of the company's debt. The YTM may be obtained using the last issued bond or, in case of multiple bonds available, through the weighted average of each bond, as explained by Koller et al (2010).

2.3.1.3. Weighted Average Cost of Capital

The weighted average cost of capital (WACC) is the rate used to discount free cash flows in valuation models, specifically for firms that have both equity and debt in their capital structure.

As only the cost of equity and cost of debt, which we covered previously, are necessary, and they need only to be weighted by the capital structure of the firm, this rate is not hard to achieve. This can be seen in the following formula (Fernandez, 2007):

$$WACC = K_E * \frac{E}{D + E} + K_D * \frac{D}{E + D} * (1 - t) \quad (8)$$

With:

K_E = Cost of Equity

K_D = Cost of Debt

E = Equity D = Debt t =

corporate income tax

2.3.2. Equity Valuation – Dividend Discount Model

“When an investor buys a stock, he or she generally expects to get two types of cash flows – dividends during the period the stock is held and an expected price at the end of the holding period” (Damodaran, 2012).

The value of a stock can be represented as the present value of its future dividends until infinity, and this is the general model used to do so:

$$\text{Value per share of stock} = \sum_{t=1}^{t=\infty} \frac{E(DPS_t)}{(1 + k_e)^t} \quad (9)$$

Where:

DPS= Expected Dividends per share; k_e = Cost of Equity

This model's primary attraction is its simplicity and intuitive logic, although it is viewed by analysts as limited, only being useful to value firms that pay stable and high dividends (Damodaran, 2012). There have been various models designed by different authors that introduce different nuances into a dividend valuation, and according to Damodaran the simplest one is the Gordon Growth Model, which can be used to value a firm in its steady state where the value of the stock will be given by:

$$\text{Value of Stock} = \frac{\text{Expected Dividends Next Period}}{\text{Cost of Equity} - \text{Expected growth Rate in Perpetuity}} \quad (10)$$

The rationale for this model is the same that we used to determine the terminal value, and as we saw before, this type of model can be expanded upon by dividing time into two stages, one where we have high growth and then the other where we achieve stable growth, which can be represented by the following formula, as shown by Damodaran (Damodaran, 2012).

$$\text{Value of the Stock} = \sum_{t=1}^{t=n} \frac{DPS_t}{(1 + k_{e,hg})^t} + \frac{P_n}{(1 + k_{e,hg})^n} \quad (11)$$

With,

$$P_n = \frac{DPS_{n+1}}{k_{e,st} - G} \quad (12)$$

Where:

g = extraordinary growth rate for the first n years;

P_n = Price at the end of year n

G = Growth Rate forever after year n

2.4. Relative Valuation (Multiples)

Damodaran defines multiples as a tool that is as easy to use as it is to misuse. While a discounted cash flow valuation tries to find the value of an asset, given certain characteristics, a relative valuation values them based on how similar assets are priced in the market (Damodaran, 2012).

Damodaran divides these multiples into three groups: Earnings Multiples, Book Value Multiples and Revenue Multiples.

Table 2.1: Valuation Multiples

Source: Damodaran (2012)

	Examples	Formula
Earnings Multiples	PER	Market Value per share / Earnings per Share
	PEG	PE Ratio / Expected Growth Rate
	Relative PE	PE Ratio firm / PE Ratio Market
	EV / EBITDA	EV / EBITDA
Book Value Multiples	Price to Book Equity	Market Price per Share / Book Value per Share
	Value to Book Ratio	Market Value of Equity and Debt / Book value of Equity and Debt
Revenue Multiples	Price to Sales	Market Value of equity / Revenues
	Value to Sales	(Market Value of Equity and Debt - Cash) / Revenues

Some basic steps were defined by Damodaran (2002) to guarantee that multiples are not misused. Consistently define the multiple, uniform with the measurements that are made to firms in the same sector. Be aware of the cross-sectional distribution of the multiples. Understand the fundamentals of your multiple and how changes in these fundamentals translate into changes in the final value. Find the right companies to use for comparison and control for differences that persist across the firms.

2.5. Valuation Applied to Football Clubs

The existing literature around the valuation of football clubs has been analysed by Tom Markham (Markham, 2013). In that paper, an analysis of several valuation techniques was performed, with a focus on their performance when applied to football clubs.

The first method analysed was the DCF model, which has been found to be flawed when valuing football clubs (Tiscini & Strologo, 2016). The primary reason for this is that most football clubs in the UK are loss-making entities, and do not have any positive future cash flows to discount back to today's value. Another reason that makes this method difficult to apply for football clubs is the unpredictability of revenues, which just comes with the territory when we deal with sports.

The second method was the traditional Revenues Multiples Approach, a relatively simple method that can easily be applied to football clubs. Deloitte, in their annual report of football finance, has shown that football clubs typically cost between 1.5 and 2.0 times their revenue (Dan Jones, 2021). This research was based on the purchase prices of premier league clubs sold between 2003 and 2008.

Other benchmarks were also analysed to compare results, such as the club valuations that Forbes performs every year since 2004 (using multiples), bankruptcy valuations and market capitalization value of football clubs.

No valuation method has been found to provide consistent results when dealing with football clubs, so Markham proposed a new model that considers financial variables as well as key performance indicators (KPI's) related to football clubs (Markham, 2013). The model goes as follows:

$$\begin{aligned}
 \text{Club Value} = & (\text{Revenue} + \text{Net Assets}) * \left(\frac{(\text{Net profit} + \text{Revenue})}{\text{Revenue}} \right) \\
 & * (\text{Stadium Capacity \%}) \div (\text{Wage Ratio \%})
 \end{aligned}
 \tag{13}$$

This model was proposed to avoid discounting future cash flows, a method that has been shown to suffer when applied to football clubs, while also providing some more robustness to multiples valuation, by introducing some industry KPI's. The results were very promising when compared to actual club sale values.

The net assets figure is made up of a club's fixed assets added to current assets less current and long-term liabilities taken from its audited financial statements. The figure takes into consideration a club's short and long-term debt obligations.

2.6. Conclusion of the literature review

In this section of the work, several models were studied, all of them great tools to value firms, but we still need to choose a valuation path that makes sense for the reality of this work, which will be the valuation of a football club.

Given that, our valuation will begin with a Free Cash Flow to the Firm (FCFF) model and then a multiples approach will complement it, where we will employ Tom Markham's work.

3. Manchester United Overview

3.1. Manchester United History

Manchester United is a professional football club located in Old Trafford, Manchester, United Kingdom. The club's origins can be traced back to 1878 when it was initially known as Newton Heath LYR and in 1902 it became Manchester United.

The club has a record 20 Premier League titles, 12 FA Cups, 4 League Cups, and 21 FA Community Shields to its name. This extensive collection of titles makes Manchester United the most decorated club in English football history.

On the international stage, Manchester United has achieved significant success, including winning 3 UEFA Champions League titles, 1 UEFA Cup, 1 Europa League, and several other prestigious honours. This global success has contributed to the club's immense popularity in most regions of the world, making it an internationally recognizable brand.

In August 2012, Manchester United was listed on the New York Stock Exchange (NYSE).

3.2. Manchester United Business Model

3.2.1. Commercial

The club markets its global brand via two revenues streams: the first being sponsorships where the club monetizes its brand and community of followers through marketing and sponsorship relationships with leading international and regional companies around the globe.

The other commercial revenue avenue is Retail, Merchandising, Apparel & Product Licensing where the club markets and sell sports apparel, training and leisure wear and other clothing featuring the Manchester United brand on a global basis. This revenue stream is relatively stable, as it feeds of the club status as a top football club, a status that, even in a worstcase scenario of sporting performance, is almost sure to last at least another 5 to 10 years.

3.2.2 Broadcasting

Broadcasting entails the distribution of live football content and global television rights relating to the Premier League, UEFA club competitions and other competitions, which includes, in some cases, prize money received in respect of various competitions, varying from year to year because of variability in the amount of available prize money and the performance of the men's first team in such competitions.

3.2.3. Matchday

Referring to the sale of tickets to Old Trafford, one of the world's most iconic sports venues with 74,239 seats, averaging over 99% of attendance capacity for our Premier League matches

played in front of a crowd in each of the last 23 years. Matchday revenue will vary but be stable from year to year, bar any catastrophic events (such as the covid 19 pandemic), because of the number of home games played and the performance of the men’s first team in various competitions.

3.3. Manchester United Financial Performance

In last 5 five years Manchester United has shown a consistent trend of revenue stagnation. In 2020 and 2021 we can see a big decrease in revenues, which can be attributed to Covid-19, as some games were cancelled, causing a decrease in broadcasting and matchday revenue streams.

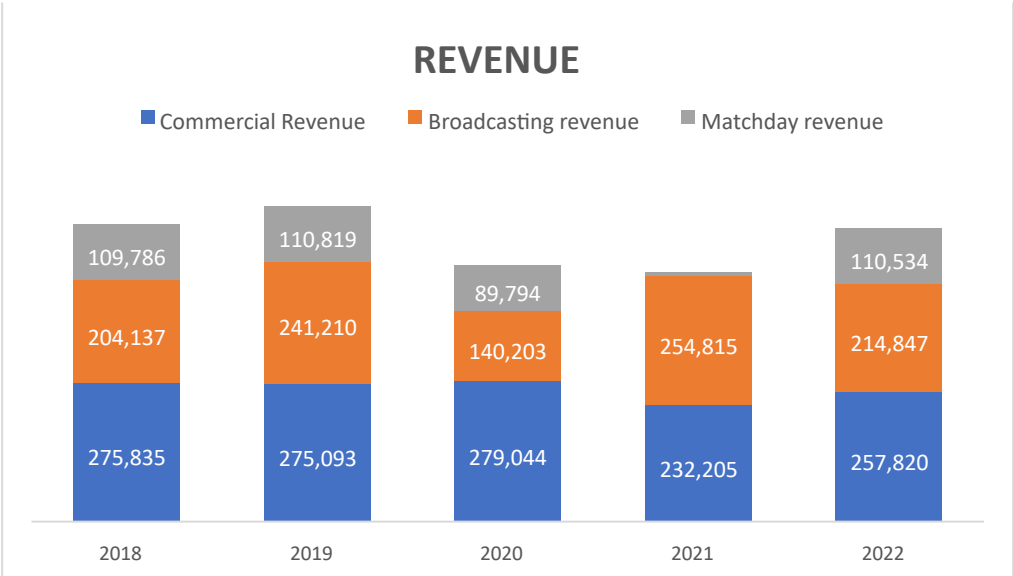


Figure 3.1: Revenue split over last 5 years
 Source: Manchester United annual report 2022

The main trends we can see from this graph, and that should be taken into consideration in the revenue projections, later in this work, are the following:

1. Although the football industry is growing, the club is not.
2. Broadcasting revenues are volatile, as can be seen in 2020, a year where the club did not qualify for the champions league, the main European competition.
3. Commercial Revenue are somewhat stable, if you do not take extreme events, like the Covid 19 pandemic, into consideration.
4. Matchday Revenue: extremely stable, as the club is able to sell out the stadium in all games, so only extreme events will cause this revenue stream to fall, as can be seen in 2020 and 2021, when the Covid-19 pandemic caused the lock down of the stadium. These considerations

on the different revenue streams will be central to the creation of estimates in the valuation section of this work.

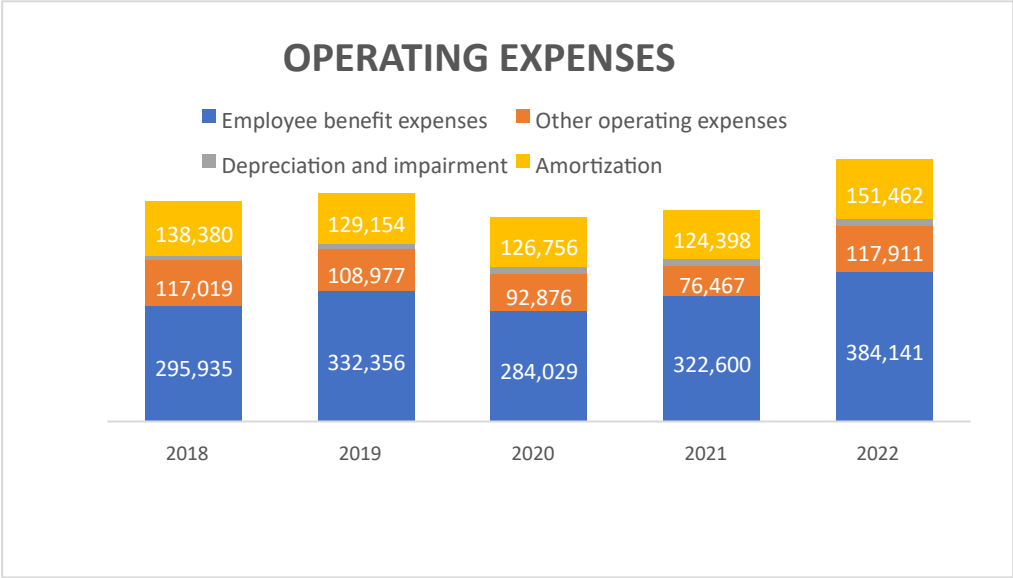


Figure 3.2: Operating Expenses over last 5 years
 Source: Manchester United annual report 2022

On operating expenses, we can see that the largest component are the wages payed to players, and this figure has grown considerably in the last 5 years, being almost 60% of the total. The amortization figure refers to the amortization of players contracts and it grows in line with the employee benefits, considering most of the value of a player’s contract is in its wage.

3.4. Manchester United Stock Performance

Manchester United is a public quoted company since August 2012, having started with a price of \$14.00/share.

During the 9 years that this stock has been listed, there has been little growth in the stock price. As of 28th of April 2023, the date of this valuation, the stock trades at \$20.05, which would imply a 43% growth, 3.5% annualized.

However, this can be somewhat misleading, as the share price grew 61% in a matter of 8 days, in 2022, from the 18th to the 25th of November, as it became publicly known that the owners of the club were looking into a sale of the club.

Finally, the stock’s price had been going down in the last 5 years, until the announcement of the sale. This is important to note for our valuation, as there need to be some underlying factors behind this, that we will look to capture and explain.

Regarding dividends, the club has been paying 9 cents per share semi-annually, which translates to around 1% annually. In 2022, the club only distributed dividends once, which can be related either to outrage from fans (the club has been having mediocre results, and no other English club pays dividends) or to the possible sale, as the news of the sale and the news of no dividend payment came out near each other.

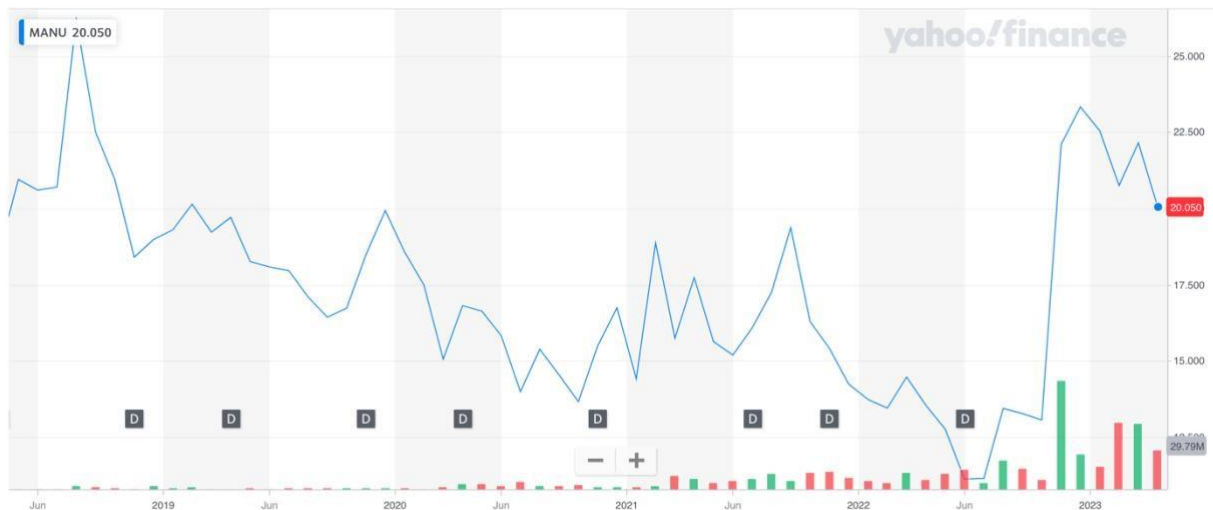


Figure 3.3: Manchester United Monthly Stock Price

Source: Yahoo Finance

3.5. Manchester United Structure and Dividend Policy

At the end of 2022, Manchester United had 163 million shares outstanding. There are Class A ordinary shares, that entitle 1 vote per share, and Class B ordinary shares, that entitle 10 votes per share.

The table below shows all major shareholders, those that own at least 5% of stock:
 Table 3.1: Manchester United major shareholders
 Source: Manchester United annual report 2022

	<u>Class A Ordinary Shares</u>	<u>%</u>	<u>Class B Ordinary Shares</u>	<u>%</u>	<u>% of Total Voting Power(1)</u>
Lindsell Train Limited(2)	10,847,340	20.55%	—	—	0.94%
Ariel Investments, LLC(3)	10,934,059	20.71%	—	—	0.95%
Massachusetts Financial Services Company(4)	3,166,867	6.00%	—	—	0.27%
Avram Glazer(5)	—	—	16,606,979	15.07%	14.38%
Joel M. Glazer(6)	1,707,614	3.23%	21,899,366	19.87%	19.11%
Kevin Glazer(7)	—	—	15,899,366	14.43%	13.77%
Bryan G. Glazer(8)	—	—	19,899,365	18.06%	17.23%
Darcie S. Glazer(9)	603,806	1.14%	20,899,365	18.96%	18.15%
Edward S. Glazer(10)	—	—	15,003,172	13.61%	12.99%

As it can be seen, almost all voting power is held by the Glazer Family.

4. Football Industry Overview

4.1. Organisation

The origins of football trace back to the 19th century in England, where its rules were initially standardized. Like in other billion-dollar industries, the political landscape has intensified as the structures have grown more intricate, necessitating enhanced oversight, and in football's case it is in the form of governing bodies stretched out over countries and continents. In the present day, the realm of professional football can be categorized into three distinct groups:

International Competitions like the World Cup and the Euros are run by FIFA and the federation of each continent, like UEFA in Europe. International Club Competitions where each confederation can organize tournaments between its constituent clubs. In Europe, where Manchester United plays, UEFA organizes the UEFA Champions League, the Europa League, and the Conference League. To qualify for these competitions, clubs need to perform in their national competitions (which will be explained next). The UEFA Champions League has a total prize pool of 600 million euros, and, as an example, just reaching the competition yielded 40 million euros to Manchester United in their last qualification, proving that big clubs need to reach this competition both for financial and reputational aspects. Finally, national Club Competitions are run by the federations of each country. Manchester United plays in the Premier League. In this competition, clubs earn their share prize based on their, although there are some fixed components. In the last season, the club with the smallest prize got 160 million pounds, which is very significant, when considering that the most valuable clubs are bringing in slightly less than 1 billion pounds in revenues.

4.2. Revenue generation

Clubs' earnings, particularly those in the top echelon of football, are generated by broadcasting rights, prizes and matchday revenues, and, given their position as brands, revenue from commercial rights such as sponsorships and merchandise.

According to Deloitte, the overall commercial revenue of the top 20 clubs in the world (according to the same report), in 2022, accounted for over 3.8 billion Euros, growing 8% year on year and 35% since 2015.

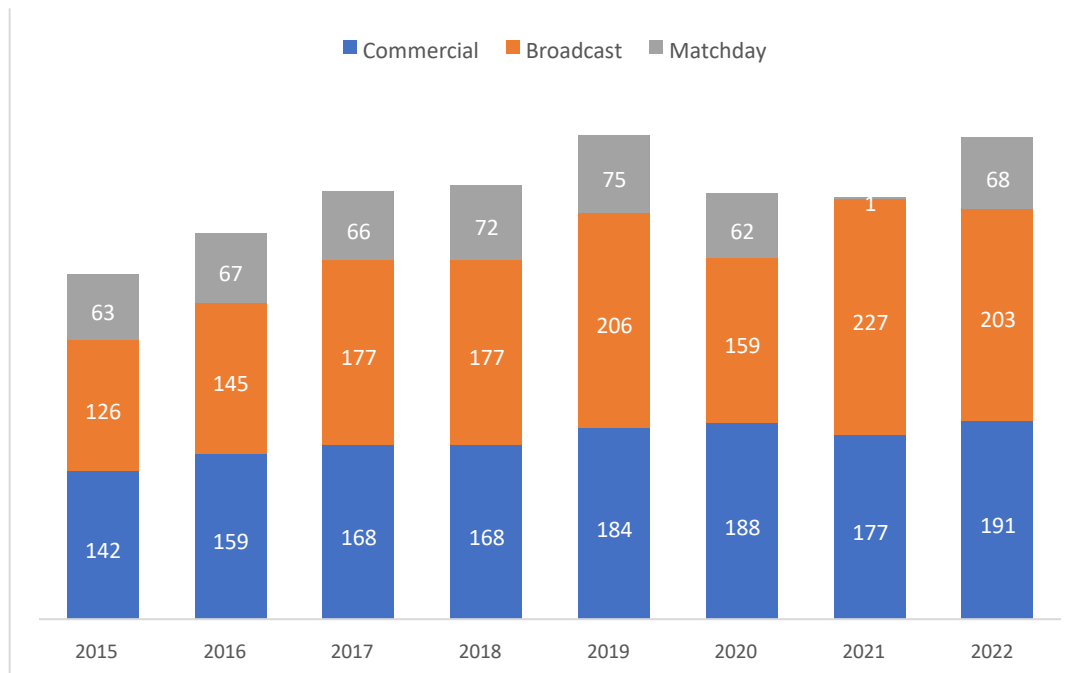


Figure 4.1: Revenue from top 20 clubs
Source: Deloitte UK

The football industry has been expanding and is expected to maintain this record, as the sport sees no slowdown in its usual markets, alongside the appearance of new and very passionate markets, mainly in North America and Asia.

4.3. Competitors

Manchester United is part of an elite group of clubs that stands at the top of elite football. Every year, Deloitte publishes a report called “Deloitte Football Money League”, where they report on the main industry trends, and share some data about the top twenty clubs, in terms of brand value, and Manchester United has had a steady presence in this report, being ranked as the fourth largest clubs in the world, in the 2023 report.

Considering this position, this top 20 is a good reflection of the competitors that Manchester United must look out for. A further inspection shows us that 55% of these clubs belong to the Premier League, which shows the dominance of this league in the international stage. As such, one can conclude that Manchester United’s most direct competitors are the clubs that compete in the same league, which is further backed by the fact that the club has been lacking in domestic titles, losing some of its relevance on the pitch.

Furthermore, UEFA publishes a coefficient that ranks clubs based solely on the performance on the pitch, where Manchester United is currently, at the date of the report, ranked as number

ten, which, when compared with its status as the fourth most valuable club, shows the dissonance between the clubs' performances and its value as brand.

The club has been able to capitalize on its past, as a victorious club, to become the brand giant that it is today, but other clubs, particularly Manchester City and Liverpool, have been consistently surpassing it consistently throughout the last decade.

Concluding, to stay clear of competitors, the club needs to improve its performances, as it won't be able to feed off its past glories forever, which has been seen in many cases of clubs that once conquered international football, and today are forgotten by most.

5.Valuation

We will start by valuing Manchester United with the FCFF model, where cash flows will be projected through a horizon of five years (2023-2027), and then discounted at the WACC. The cashflows represent the EBIAT, plus Depreciation and Amortization, less Capex, and changes in working capital.

After this period, a terminal growth rate is assumed for the final cash flow. After obtaining the price of Manchester United's shares, we will perform a sensitivity analysis to understand the impact that the TGR and WACC had in our result.

It should also be considered that an event has occurred involving Manchester United that can have material effects on this valuation. During November of 2022, the family that owns Manchester United showed interest in selling their stake in the club. This caused much volatility on the stock price, it rose 73% in a matter of days, from \$13.03 to \$22.56. Having that said, this valuation will be pursued nonetheless, as this event will add a layer of complexity to the analysis of our results. It also shows us that there is more to valuation than just numbers, as it is difficult to explain with the typical valuation methods, how a change of ownership can almost double the value of a company. There will always be a human element to the valuation of any asset.

To add a further layer of complexity and innovation to the work, we also decided to follow a distinct path in the Relative Valuation of Manchester United. The usual theory on this subject point towards ratios computed with the following financial indicators: the EBITDA, the enterprise value, and revenues, being some of the most popular. But, as discussed in the literature review, football clubs have a lot of particularities that are hard to express in these indicators, one of them being the fact that a lot of big clubs have negative operating results year after year. This can happen for several reasons, one of them being the fact that some owners are very wealthy and run clubs almost like a hobby. So, we will apply a method brought forward by Tom Markham in 2013, that introduces KPI's like stadium capacity and wages, mixing them with more traditional financial indicators.

5.1. Valuation Estimates

5.1.1. Revenue Estimate

The projection of revenues is one of the most important elements in an equity valuation, as many components of the valuation vary in accordance with this variable.

Manchester United turnover comprises commercial, broadcasting and matchday activities, as explained before.

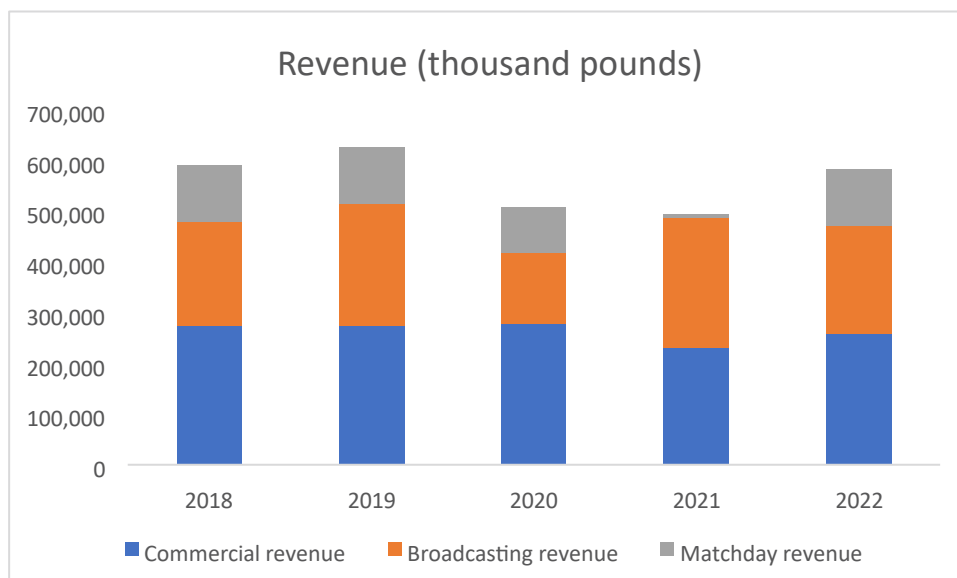


Figure 5.1: Revenue streams over last 5 years
Source: Manchester United annual report 2022

The football industry is expected to grow at a five to six percent CAGR, according to sources like Statista and Market Watch. With that said, a CAGR of 6% will be considered for both matchday and commercial revenue streams.

Table 5.1: Matchday and Commercial Revenue estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Matchday Revenue	117,166	124,196	131,648	139,547	147,919
growth %	6%	6%	6%	6%	6%
Commercial Revenue	272,508	288,035	304,448	321,799	340,140
growth %	6%	6%	6%	6%	6%

For the Broadcasting Revenue however, a more elaborate approach was used. These revenues have been growing at a faster pace, given football's expansion to the Asian markets, given this, a 7% CAGR was considered.

Furthermore, these revenues are severely volatile, as the club’s revenue can decrease by more than 100 million pounds if a Champions League presence is not secured, so the following table was created, to test different scenarios for the DCF, given various sporting performances by the club. The “1” represents a qualification to the UEFA Champions League.

Table 5.2: Champions League qualification scenarios

Source: Author

	2023	2024	2025	2026	2027
Base	1	1	0	1	1
Optimistic	1	1	1	1	1
Conservative	1	0	0	0	0

This 7% CAGR is to be considered in successive years when the club maintains its sporting performance (two consecutive years either qualifying or not qualifying to the Champions League).

If we look at historical data, we can see a 100-million-pound revenue drop in 2020, due to a year where the club failed to qualify for the UEFA Champions League. This will be taken as a benchmark for our estimate above. That is, in years where the club does not qualify, the 2020 figure will be taken, multiplied by the CAGR, and considering the years that have passed.

Table 5.3: Historical Broadcasting Revenue

Source: Manchester United annual report 2022

(in thousands of pounds)	2018	2019	2020	2021	2022
Broadcasting revenue	204,137	241,210	140,203	254,815	214,847

These are the results, in terms of revenues, where certain spikes can be seen in years where the club is not able to qualify for the UEFA Champions League. This mimics what can be observed in the club’s history.

Table 5.4: Broadcasting Revenues Estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Base 60%	229,886	245,978	196,642	281,621	301,334
Optimistic 10%	229,886	245,978	263,197	281,621	301,334
Conservative 30%	229,886	183,778	196,642	210,407	225,135

To reach a final revenue figure, we applied weights to each scenario (60% to the base scenario, 30% to the conservative scenario and 10% to the optimistic scenario).

These are the final revenue figures:

Table 5.5: Final Revenue Estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Revenue	619,560	639,549	639,393	721,602	766,534
%growth	6%	3%	0%	13%	6%

5.1.2. EBIT Estimate

To reach the EBIT figure, we need to estimate the Operating Expenses, the Operating profit (loss) on disposals and the depreciation.

The Operational Expenses of Manchester United are divided in Employee Expenses and Other Operating Expenses. The employee expenses are comprised of player and staff compensation. This is a crucial expense line for Manchester United, as wages are a crucial way to attract high quality players, which then allow the club to grow its revenue. The other operating expenses encompass the costs with matchday catering, policing, security stewarding and cleaning at Old Trafford.

The club expects that these costs will grow in line with revenue growth, and as of the last published financial reports, no big expenses are expected for the following years: “In addition, as our commercial operations grow, we expect our headcount and related expenses to increase as well.”. Given the prior, these costs will grow in line with revenue. A percentage of revenue was calculated as an average of the past 5 years.

Table 5.6: Operating Expenses estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Operating Expenses (excluding depreciation)	472,460	487,703	487,584	550,274	584,538

The profit on disposal of intangible items line is where the club recognizes the acquisition and disposal of football players. Once again, the same rationale will be followed, and this line will grow in line with revenue growth. A percentage of revenue was calculated as an average of the past 5 years.

Table 5.7: Operating (loss)/profit on disposals estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Operating (loss)/profit on disposals	19,891	20,533	20,528	23,167	24,610

Finally, depreciation and amortization charges are mostly influenced by the acquisition of players, whose cost will be amortized according with the duration of the contract, which is typically from 3 to 6 years. Once again, the board shows no intention to drastically change its signing policy, this can be seen both in the Annual Report and by observing the policy for the past years. Given this, the line is expected to grow alongside revenue. A percentage of revenue was calculated as an average of the past 5 years.

Table 5.8 Depreciation & Amortization Estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Depreciation & Amortization	164,931	170,252	170,211	192,095	204,056

5.1.3. EBIAT

Manchester United has been subject to a 19% marginal tax rate, but the United Kingdom has increased this rate to 25%, which will take effect in 2023. because the club has not been producing a positive profit before tax for the past years, it is not straightforward to try and get the effective tax rate that the club would pay after all deductions and adjustments, as one cannot look at past years for examples.

Having that said, due to the recent years of losses, an effective tax rate of 21% will be used for the projection years, and the 25% marginal tax rate will be used for the perpetuity cash flow.

Table 5.9: EBIAT Estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
EBIT	2,060	2,127	2,126	2,399	2,549
Tax Expense	-433	-447	-446	-504	-637
EBIAT	1,627	1,680	1,680	1,895	1,912

5.1.4. Capital Expenditures

Manchester United's Capital Expenditures can be divided in those related to PPE (property plant and equipment) and those related to players registrations.

PPE mainly comprises the Old Trafford Stadium and the Training Complex. According to the Management, there is no expectation of major renewals of both infrastructures soon. For this reason, it is reasonable to assume that CaPex will not increase.

Regarding players, as mentioned before, Manchester United already invests heavily and will continue to do it, to become once again a Top line team in the Champions League. For this reason, the author considered that the current high levels of Capex - around 27% of revenue - will hold in the projection years.

Table 5.10: Capital Expenditures estimates

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Revenue	619,560	639,549	639,393	721,602	766,534
Capital Expenditures	118,810	122,643	122,613	138,377	146,994
% of Revenues	19%	19%	19%	19%	19%

5.1.5. Net Working Capital

On Manchester United's annual report, we found information regarding the working capital assets and liabilities, and as such, computing the Change in Net Working Capital presented no challenges. Regarding the estimates for the prevision years, as there is no indication in the financial reports of any expected changes to these financial statement lines, we will use the average of both working capital asset and liabilities, as percentages of the revenues.

Table 5.11: Changes in Working Capital estimates
Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Working Capital Assets	140,508	145,041	145,006	163,649	173,839
% of Revenues	23%	23%	23%	23%	23%
Working Capital Liabilities	435,568	449,621	449,511	507,306	538,895
% of Revenues	70%	70%	70%	70%	70%
Change in Net Working Capital	-13,379	-9,519	74	-39,151	-21,399

5.1.6. Terminal Growth Rate

In Manchester United's valuation, when applying the FCFF model, we assumed that cash flows will be produced until perpetuity at a constant growth rate. This constant growth rate is the terminal growth rate that can be obtained by applying the following formula, where the expected inflation rate and the expected GDP growth rate are the two main variables.

$$\text{TGR} = (1 + \text{Expected Inflation rate}) * (1 + \text{Expected GDP growth rate}) - 1 \quad (14)$$

Manchester United operates in the United Kingdom, but its operations are international, and since a large part of its revenues come from the UEFA Champions League broadcasting rights (around a seventh), the author has decided to use the expected GDP growth rate of Europe, according to Statista. The inflation rate will be the Bank of England's target of 2%.

Table 5.12: Expected growth rate and inflation target
Source: Statista and Bank of England

g	2.40%
inflation	2.00%
TGR	4.45%

When computing the perpetuity values of Revenues, EBIAT, D&A, Capex and ΔWC we applied the TGR obtained of 4,45% to the respective projected amounts of the final year.

5.2. Discounted Cash Flow

5.2.1. Free Cash Flow to the Firm

After establishing all the assumptions, we were able to compute the FCFF that was previously explained in the literature review. In the table below, we can see the computation of the FCFF for each projected year (from 2023 to 2027) and in perpetuity, by applying equation 2.

Table 5.13: Free Cash Flow

Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Revenue	619,560	639,549	639,393	721,602	766,534
Operating expenses and disposals	492,351	508,236	508,112	573,441	609,148
EBIT	2,060	2,127	2,126	2,399	2,549
Tax Expense	-433	-447	-446	-504	-637
EBIAT	1,627	1,680	1,680	1,895	1,912
+D&A	164,931	170,252	170,211	192,095	204,056
-Capital Expenditures	118,810	122,643	122,613	138,377	146,994
-Change in Net Working Capital	-13,379	-9,519	74	-39,151	-21,399
Unlevered Free Cash Flow	61,128	58,809	49,203	94,764	80,373

5.2.2. Cost of Capital

5.2.2.1. Cost of Debt

Manchester United's cost of debt was taken from its last annual financial statements, where they mention the last debt issuance of \$425 million, at a 3.79% interest rate. This will be used as the pre-tax cost of debt.

5.2.2.2. Cost of Equity

To determine the cost of equity we need to obtain the Market Risk Premium, the Beta, and the risk-free rate, as it was explained in the literature review.

Regarding the risk-free rate, we used the UK 10 years treasury rate of 3.77% dated to 28th of April of 2023.

Then, as mentioned in the literature review, there exists no consensus regarding a method to determine the market risk premium. The most widely used method consists in averaging the annualized excess returns of the market over the long-term risk-free rate, and then adding a risk premium for the country.

Manchester United is a UK company, but its revenue sources are very geographically spread, as such we used the 10y annualized return of the IWDA index, which is composed of large and mid-cap companies from all around the globe. According to Damodaran’s website, the risk premium of the UK as of 28th of April 2013 was 1.03%.

Table 5.14: Market Risk Premium

Source: Yahoo Finance and Aswhat Damodaran

IWDA 10y Return	10.63%
-Risk Free Rate	3.77%
+Country Risk Premium	1.03%
Market Risk Premium	7.88%

Finally, regarding the Beta, we considered the same index, and used python to build a covariance matrix between the IWDA’s and Manchester United’s daily returns (Annex A).

After having established all the necessary parameters we computed the cost of equity, and by applying equation 7 a cost of 8.11% was obtained.

Table 5.15: Cost of Equity

Source: Author

Market Risk Premium	7.88%
Beta	55.00%
Cost of Equity	8.11%

5.2.2.3. Market value of equity

The Market value of equity will be used to compute the optimal ratios of debt and equity for the WACC. To obtain this value, one needs only to take the number of issued shares in the market, and compute it by the stock price, which yields a value of \$3,268 million.

5.2.2.4. Market value of debt

The club’s book value of debt was directly taken from the annual report of 2022, amounting to \$630 million. Then, through getting relative weights of each of the debt obligations, we got that the average duration of the debt is 4.85 years.

Table 5.16: Manchester United Debt Obligations
 Source: Manchester United annual report 2022

(in thousands of pounds)	Relative Weight	Maturity	Days to maturity
347,173,000	55%	25/07/2027	1549
183,192,000	29%	26/08/2029	2312
100,000,000	16%	25/07/2027	1549

We were able to compute Manchester United's market value of debt by applying the following formula.

$$\text{Market Value of Debt} = I \times \frac{1 - \frac{1}{(1 + K_d)^t}}{K_d} + \frac{BVD}{(1 + K_d)} \quad (15)$$

Where,

I = Interest Expenses;

K_d = Cost of Debt; BVD = Book Value of Debt; t =

Weighted Average Maturity of Long-Term Debt

A market value of debt of \$526 million was obtained.

Table 5.17: Market value of Debt (in thousands of pounds)
 Source: Author

Kd	3.79%
Interest Expenses	17,262
Book value of debt	630,365
t	4.85
Market Value of Debt	526,355

5.2.2.5. Weighted Average Cost of Capital

The WACC was then obtained after the computation of all its parts and by applying equation 6 a WACC of 7.38% was obtained. In the table below we can see a compilation of all the previously computed inputs.

Table 5.18: Weighted Average Cost of Capital
Source: Author

Ke	8.11%
e/(d+e)	86.13%
Kd	3.79%
d/(d+e)	13.87%
tax rate	25.00%
WACC	7.38%

5.2.3. Final Results

Now that we have computed the cash flow for each projection year, the TGR and the WACC, we need only to discount each cash flow to its present value and sum all cash flows to get the Enterprise Value. Then to obtain the share price, we divide the Enterprise Value by the number of shares.

It is also worth noting that since the above calculations were done with pounds (GBP), we need to use the GBP/USD foreign exchange rate to get the final share price, as Manchester United is listed in the New York Stock Exchange. This yielded a final price of \$15.12.

Table 5.19: Discounted Free Cash Flows
Source: Author

(in thousands of pounds)	2023	2024	2025	2026	2027
Free Cash Flows	61,128	58,809	49,203	94,764	80,373

Table 5.20: Manchester United Stock Price (in thousands of pounds)
Source: Author

WACC	7.38%
Present Value FCF	£275,261
TGR	4.45%
Terminal Value	£2,865,258
Present Terminal Value	£2,007,198
Enterprise Value	£2,282,459
GBP/USD Rate	£1.08
Number of Shares	163,001,000
Stock Price	\$15.12

Finally, we should also mention that the price is a weighting of the three different scenarios explained in the Broadcasting Revenues section of this thesis.

Table 5.21: Manchester United stock price scenarios (in dollars)

Source: Author

	Stock Price	Change vs Weighted
Conservative	\$ 13.97	-7.60%
Base	\$ 15.61	3.22%
Optimistic	\$ 15.65	3.48%
Weighted	\$ 15.12	

It can be observed that a sports business has an underlying volatility, as, although the calculations in this thesis are no more than a rough estimate, a bad performance in the champions league could mean as much as an 7.6% decrease in the valuation of the club.

5.2.4. Sensitivity Analysis

In the Free Cash Flow to Firm model presented, different assumptions were made that impact our final valuation. Two of these variables, the WACC and the TGR, hold a lot of influence in the valuation, as such, we decided to perform a sensitivity analysis, to study the impact of 20 basis points changes in these variables.

In the model we estimated a TGR of 4,45% and a WACC of 7,38% what led to a share price of \$ 15,12.

The model is almost as sensitive to the WACC and TGR, as a 40 basis points decrease of the WACC would result in a 16% price increase, and a 40 basis points increase in the WACC would results in a 14,2% increase in the share price.

Table 5.22: Sensitivity analysis
Source: Author

		WACC				
		6.98%	7.18%	7.38%	7.58%	7.78%
	4.05%	15.34	14.35	13.48	12.71	12.02
T	4.25%	16.36	15.23	14.25	13.38	12.62
G	4.45%	17.54	16.24	15.12	14.15	13.29
R	4.65%	18.92	17.41	16.12	15.01	14.05
	4.85%	20.56	18.78	17.28	16.01	14.91

5.3. Relative Valuation

As explained before, due to the nature of football clubs, we decided to follow a novel approach in the relative valuation of football clubs.

One of the first challenges comes in the form of comparability, as there is no exchange traded football club with the dimension of Manchester United, the only two that comes close are Juventus and Dortmund. The Deloitte Money League report is one of the most renowned financial reports about football, where in 2023 Manchester United was ranked as the 4th largest club in the world, and Juventus comes as number 11 and Dortmund as number 13.

Manchester United's revenue (\$688 million) comes close to the combined revenue of Juventus and Dortmund (\$756 million). In terms of social media presence, Deloitte's 2022 shows that the difference is even larger, while Manchester United has 177 million followers (across Twitter, Facebook, Instagram, Youtube and Tik-Tok), Juventus and Dortmund have 158 million. Nonetheless, to be able to have a comparison, the peer group will be constituted by: Juventus, Dortmund, Ajax and Celtic.

The approach for computing what is represented in the table as "KPI's Enterprise Value" is explained in the literature review, in equation(x) (page 7). There will be a comparison between the market cap of the clubs, and the valuation obtained.

First, we can see how this measure has evolved in the last 5 years regarding only Manchester United.

Table 5.23: Manchester United's multiples analysis

Source: Author

(in thousands of pounds)	Manchester United				
	2018	2019	2020	2021	2022
Revenue	589,758	627,122	509,041	494,117	583,201
Net Assets	176,926	148,102	-25,543	-49,679	-545,384
Net Profit	-6,874	17,238	-23,233	-92,216	-115,510
Stadium Capacity %	100%	100%	100%	100%	100%
Wages	151,424	152,620	180,735	193,895	191,383
Wage to Revenue	26%	24%	36%	39%	33%
KPI's Enterprise Value	2,951,235	3,272,987	1,299,622	921,221	92,415
Market Cap	3,374,121	2,927,498	2,280,384	2,621,056	2,163,023
% of Market Cap	87%	112%	57%	35%	4%

It is clear to see that, when using this formula, the value of the club has been going down rapidly over the past 5 years. This can be attributed mainly to the decrease in the Net Assets figure, which is the difference between PPE and the debt of the club. The author of this method chose the Net Assets to represent the future ability of the club to generate revenue, as it includes the value of the club's stadium, and other relevant infrastructure, such as training grounds.

As the club's debt has been growing quickly, paired with an increasing wage bill and negative net incomes, this formula, based on this KPI's, is devaluing the club. The results show that in the last year of the analysis, only 4% of the club's market cap could be explained by the indicators and formula brought forward by the author Tom Marham.

Multiples valuations can sometimes be a bit rougher when compared to DCF approaches, but it is hard to deny that the club's fundamentals have been deteriorating over the years, which is line with the Market Cap figure, which shows the same pattern.

Here, we can see the results for the chosen peer group.

Table 5.24: Peer group's multiples analysis

Source: Yahoo Finance

	Peer group			
	Juventus	Dortmund	Ajax	Celtic
Revenue	442,647	351,645	184,269	88,235
Net Assets	-192,275	94,514	18,459	26,328
Net Profit	-254,313	-35,059	-24,320	5,849
Stadium Capacity %	100%	100%	100%	100%
Wages	137,424	113,392	41,940	25,150
Wage to Revenue	31%	32%	23%	29%
KPI's Enterprise Value	343,125	1,245,658	773,155	428,570
Market Cap	1,017,217	460,000	188,000	120,000
% of Market Cap	34%	271%	411%	357%

The first thing to point out is that these results are very volatile. Only Juventus would be overvalued under this approach, while the others would seem undervalued. The main factor that we can attribute as a cause of this, is the leverage. Juventus, as Manchester United, as a negative net assets figure, which means that its main revenue generating assets are not enough to pay its obligations. Both these clubs are regular appearances in sports media, with mentions of shaky finances, and the leverage tends to be the main factor mentioned, which goes in line with the findings.

Finally, investors can sometimes overlook this factor, if prospects are good enough, and this may be an explanation for the apparent difference between Manchester United, Juventus, and the other three clubs. The two clubs are also substantially larger than the others, in terms of revenues, fans and sports achievements in recent years.

5.4. Valuation Results

As of the 28th of April 2023, the date of this valuation, Manchester United's share price sits at \$20.05, and the club is amidst a possible sale, as the owners, the Glazer's Family, look to profit on their investment, and look for investors, in the middle of an unprecedented investment in football coming from the Asian and North American markets.

With the work produced in this thesis, we obtained a price of \$15.12, which would imply that the stock is overvalued by about 33%, meaning that we would advise Manchester United's investors to sell this share.

Our results were further backed up by our multiples valuation, that shows that over the years the quality of the club's fundamentals has been decreasing, with a severe increase in debt that has not been producing neither a significant improvement of revenues nor better performances in domestic and international competitions.

The club's share price has been stagnant since its IPO in 2012, versus a 33% growth in the same period when compared to the Footse 100, or a 260% growth when compared to the IWDA index. This shows that investors recognise that the club is not on the most fruitful path, especially when this decade has shown unprecedented growth of the football market.

Furthermore, although the owners are looking to sell the club, there have been reports that they have been having trouble finding a suitable buyer, that is willing to meet their expectations. If the sale were to be put off, all the premium that is now implied in the stock price might vanish, as there was a 73%, almost immediate, increase in the stock price when the news about a possible sale came out.

Finally, given that this is a football club, that lives off results and brand image, the recent times have not been ideal, with the club being involved in scandals both on and off the pitch, with players such as Cristiano Ronaldo criticizing the club, and others being involved in domestic abuse scandals.

6. Conclusion

The goal of this project was to determine the fair value of Manchester United's shares and we manage to do it by applying the FCFF model and a novel approach to relative valuation of football clubs. Even though the models were chosen based on a complex literature review, we recognize that different models could have been applied, particularly to be able to capture all the particularities of a football club.

The FCFF model focus on discounting future cash flow, meaning that the two main components come to down to a rate and a projection of future values. Given that, several assumptions were taken and justified. To test the resilience of the model, we stretched some of these assumptions with a sensitivity analysis.

The relative valuation in this paper did not follow the standard approach in these types of papers. This is the case because football clubs, despite being firms that need to generate revenue to survive, as any other firm, can sometimes be ran by non-rational economic actors, in the sense that they might not always be looking for a return on their money, at least not in the traditional sense. Given that, the method used captures some non-financial KPI's, and devalues some of the more traditional indicators.

In the discussion of the results, it was mentioned that both models led to the same conclusion that the share price is overvalued. Therefore, our final recommendation is that investors should sell Manchester United's shares, since the prices obtained are both below the market value registered on the 28th of April of 2023 (\$20.05). This result was not surprising, as the club is amidst a possible sale, and there is some premium implied in the stock price, which was not captured in the FCFF, nor the relative valuation.

It is also important to mention that the information in this report has a cut-off date as of 28th April 2023, so the use case of these paper can be limited, and the recommendation is no more than an academic application.

Finally, we recommend that new assessments are made, particularly on the relative valuation section of this work.

7. References

7.1. Academic and Book References

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<http://ssrn.com/abstract=2238265>

7.2. Reports

Manchester United, plc, Annual Report 2022

Manchester United, plc, Annual Report 2021

8. Annexes

8.1. Annex A

```
import numpy as np
import pandas as pd
!pip install scipy from scipy
import optimize
import matplotlib.pyplot as plt
import requests from datetime
import datetime from bs4
import BeautifulSoup
!pip install pandas_datareader
import
```

```

pandas_datareader from
pandas_datareader import data as pdr
!pip install yfinance --upgrade
import yfinance as yf
#Getting historical prices
company=yf.Ticker('MANU')
print(dir(company))
#getting historical data for MANU company_prices = company.history(interval='1d',
start='2013-04-28', end='2023-04-28'); company_prices.index =
pd.MultiIndex.from_arrays([company_prices.index.date, company_prices.index.time],
names=['Date','Time']); company_prices
#getting historical data for iwda prices index=yf.Ticker("IWDA.AS")
index_prices=index.history(interval='1d', start='2013-04-28', end='2023-04-28');index_prices
index_prices.index = pd.MultiIndex.from_arrays([index_prices.index.date,
index_prices.index.time], names=['Date','Time']); index_prices
daily_prices=company_prices[["Close"]].join(index_prices[["Close"]],lsuffix='Pr_company',
rsuffix='Pr_index') daily_returns=daily_prices.pct_change();daily_returns
cov_matr=daily_returns.cov(); cov_matr beta=cov_matr.iloc[0,1]/cov_matr.iloc[1,1] beta

```