



Lisbon School
of Economics
& Management
Universidade de Lisboa

MASTER
FINANCE

MASTER'S FINAL WORK
PROJECT

MERGERS AND ACQUISITIONS: ARROW GLOBAL
ACQUISITION OF NORFIN S.A

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OCTOBER - 2022

*It is with genuine gratitude
and warm regard that I
dedicate this dissertation to
my parents and my friends.*

ABSTRACT

The ultimate purpose of a corporation is to create value for shareholders and stakeholders. Mergers and Acquisitions are part of most large firm's strategies to support their development and value creation. Firstly, we explain some factors of the M&A process, like operational, financial, and fiscal synergies, and understand how the companies can get advantages to shareholders.

Secondly, we explore the current situation of the Real Estate Market and the Non-Performing Loans Market in the Portuguese market, which are the main expertise area of Arrow Global and Norfin S.A., references in the Asset Management and Real Estate sectors.

In this study, we will focus on financial synergies created by the transaction between those two companies in 2018. To evaluate this acquisition, we relied on two metrics, the Free Cash Flow to the Firm and Market Multiples and estimated the value of the companies on the acquisition date and presently in 2021. Using those estimates, we inferred that this operation didn't create value for the shareholders, so we can say that the merger failed.

KEYWORDS: Mergers and Acquisitions, Corporate Finance and Governance; Institutional Investors

JEL CODES: G34; G3; G23

RESUMO

O objetivo final de uma empresa é a criação de valor para os acionistas. As fusões e aquisições fazem parte da estratégia da maioria das grandes empresas para apoiar o seu desenvolvimento e criação de valor. Em primeiro lugar, explicamos alguns fatores do processo de M&A, como sinergias operacionais, financeiras e fiscais, e compreendemos como as empresas podem obter vantagens para os acionistas.

Em segundo lugar, exploramos a situação atual do Mercado Imobiliário e do Mercado de *NPL* português, que são a principal área de especialização da Arrow Global e Norfin S.A referências no sector da Gestão de Ativos e Imobiliário.

Neste estudo, vamos focarmos nas sinergias financeiras criadas pela transação entre estas duas empresas em 2018. Para avaliar esta aquisição, baseámo-nos em duas métricas, o *Free Cash Flow to the Firm* e por Múltiplos de Mercado e estimámos o valor das empresas na data da aquisição e atualmente em 2021. Utilizando essas estimativas, inferimos que esta operação não criou valor para os acionistas, pelo que podemos dizer que a fusão falhou.

PALAVRAS-CHAVE: Mergers and Acquisitions, Corporate Finance and Governance; Institutional Investors

CÓDIGOS JEL: G34; G3; G23

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LIST ACRONYMS

CAPEX- Capital Expenditures

CAPM - Capital Asset Pricing Model

EBIT – Earnings Before interest and Taxes

EBITDA – Earnings Before Interest Taxes Depreciation and Amortization

EVA – Economic Value Added

Hi-tech - Technology involving the production or use of advanced or sophisticated devices

IMAA- Institute of Mergers, Acquisitions and Alliances

ISEG – Instituto Superior de Economia e Gestão da Universidade de Lisboa

JEL - Journal of Economic Literature

NAV- Net Asset Value

COVID-19- Corona Virus Decease

WACC- Weighted Average Cost of Capital

LIST OF ABBREVIATIONS

BL -Beta Levered

BU -Beta Unelevered

BPI- Banco Português de investimento

CEO – Chief Operational office

CF – Cash Flow

D - Depreciation

DCF – Discount Cash Flow

EDP – Energias de Portugal

EU – European Union

FCFE -Free Cash Flow to Equity

FCFF – Free Cash Flow to the Firm

GDP – Gross Domestic Product

Kd – Cost of Debt

Ke – Cost of Equity

M&A – Mergers and Acquisitions

NAV- Net Asset Value

NPL – Non-Performing Loan

P/B – Price to Book value

P/E – Price to Earnings

PPE – Property Plant Equipment

PRR – Plano de Resolução e Resiliência

R&D – Research and Development

RF – Risk Free Rate

RM – Market Risk Premium

UK – United Kingdom

USA- United States of American

SPV – Special Purpose Vehicle

ACKNOWLEDGMENTS

The conclusion of this Master Thesis Final Work is the result of an academic background filled with arduous work, dedication, and quest for knowledge. I must thank to my closest family for conceding me the opportunity to study the matters of my interest and experience one of the best studies.

I would like to thank my friends for all the support and motivation during the last couple of years, ones, who I count on for life.

To my work colleagues I also want to thank, because their support me and shared their knowledge and experiences about this type of transactions, which allowed me to learn a lot from them.

Finally, the last but the most important, I would like to thank to my supervisor Prof. Paulo Francisco for giving me an opportunity to share his understanding and experience that supported me along this final work, Thanks Professor.

INTRODUCTION

Nowadays, companies face increasingly competitive and fierce markets. Markets change very fast, becoming challenging to react to them. For companies to survive, they are forced to grow and become more competitive, otherwise, they will let themselves be overtaken by competitors, stagnating in time and thus running the risk of extinction.

This final work aims to give the reader comprehension of M&A operations, through the case study of the acquisition of Norfin S.A by Arrow Global, and its surrounding concepts related to M&A.

Arrow Global was created in 2005, and specializes in asset management, asset recovery, and non-performing and non-core asset management. The firm identifies, purchases, and manages credit portfolios with and without collateral from financial institutions, and it now manages €60 billion in assets, including a €2 billion discretionary fund created in 2020. Arrow Global holds several subsidiary firms around Europe. Norfin S.A was established in 1999 as a Real Estate Private Equity business to enable Portuguese institutional investors to integrate indirect real estate investment in their asset portfolios through participation in regulated real estate investment funds. With 1.6 billion in assets under management, including national and international SPV, Norfin is a Portuguese real estate investment and management reference.

The real estate and asset management sector has been growing a lot in the last few years, especially since the financial crisis, including non-core assets such as non-performing loans. In Europe, with the financial crisis, banks' balance sheets had many non-performing loans in the Portuguese case the Non-Performing Loans reached values around 17%, which created strong pressure for the banks to sell these assets due to the pressure from regulators.

Our work shows that the Acquisition of Norfin S.A by Arrow did not yield any value for the shareholders. These results are very standard in empirical studies of M&A like the David King, Hema Krishnan; Xavier, Marianna Makri, and Mario Schijven (2009), Mahabubur Rahman Mary Lambkin (2015).

The rest of this work is organized as follows. In Chapter I, we present the literature review, starting to show the several factors that determine the success of a merger, since

its negotiation and integration and gains or losses of synergy. In Chapter II, we will address some types of financial valuation, with the intent to show the reader the advantages and disadvantages of each method. After finalizing the literature review, I will review the macroeconomic factors that can help understand the influence of these factors in M&A operations since the interest rate liquidity of the world economy. In Chapter III we analyze the M&A operation between Arrow Global and Norfin S.A. in financial terms using two measures, the Market Multiples and Free Cash Flow to the Firm. Using those measures we compute the valuation of these two companies, before and after the merger and discerned about the financial effectiveness of the merger.

In Chapter IV we present the conclusions of this project, where we conclude that this operation didn't create any value, however, the valuation for Arrow Global showed differences by the FCFF and Market Multiplies method, which can be explained by the increase in the leverage of the company, that promote the increase of the enterprise value for the FCFF method. In Market Multiplies valuation, the value of Arrow Global significantly decreased, which can be explained by the COVID-19 impacts on the earnings and the decrease of the equity that origin a decrease of price to book value.

2 LITERATURE REVIEW

Today with the Globalization and development of Financial Markets, which gives access to more liquidity with easy credit, growth the share market and increase of foreign direct investment because of the appearance of large multinational companies. In the last thirty years, if we observe closely the biggest companies, especially in the American and European market, the technological companies increased their importance and dimension of IT development. More recently, with COVID-19 this importance has grown. In this context, the business competition has increased and so as the necessity of company's growth in response to this situation. The company's concentration of operation is very common in multiple sectors to face strong competition. This type of strategy is used as a growth strategy with the main purpose of obtaining synergies gains like economies of scale and others. In an acquisition, an organization purchases an organization, a part or the whole of it. Merger is the legal activity in which two or more organizations are combined, and only one firm survives as a legal entity (Van Horne and Wachowicz, 2004). As per definition, a merger is two or more firms close together and form one or more firms (Malik et al., 2014). While in an acquisition, a big and financially sound firm purchases a smaller firm. These types of operations are used for companies to increase their competitiveness by gains of synergies like operations, tax, and other types of earnings.

2.1. Motivations for M&A

There are several explanations for why M&As occur, Seth, Song, and Pettit (2002) argue that understanding these motives is key for understanding M&A success or failure. The principal objective for an M&A is to create a synergy by integrating two or more business units and combined with an increased competitive advantage (Porter, 1985). The academics refer to other motives for M&A like hubris, greed, status or even selfishness (Calipha, Tarba, and Brock, 2010).

It is crucial that the motivation behind an M&A is strategic; otherwise, the deal would likely be incompatible with the company's capabilities and goals. When contemplating M&A priorities, an organization must consider its own competitive position, including strengths, limitations, and administrative goals. (Kitching, 1967) wrote that managers

have two different approaches to an M&A decision: “*golf course*” implies that the management jumps at an opportunity that may arise surreptitiously and “*crystal ball*” implies that the management thinks strategically, and the decision is a part of an overall corporate strategy of the company". According to Miller Jr and Segall (2017), the aim of these operations is to generate intrinsic value through a better management and capital structure adjustments (Miller Jr and Segall, 2017). Some academics refer in their study that psychological factors like fear and obsolescence are motives to M&A. The fear means that a merger is motivated by the belief that if a company does not expand, larger corporations will kill it. When companies, like elderly people, are less adaptable to changing conditions and less resilient in their attempts to cope with their environments, the obsolescence risk means that the merger is an attempt to refresh (Levinson, 1970).

2.2. Synergy

Synergy is the additional value that is generated by combining two firms, creating opportunities that would not have been available to these firms if they operated independently (Damodaran, 2005).

It is the most widely used and misused rationale in mergers and acquisitions. In this section, we look at possible synergy sources and divide them into two classes. Economies of scale increase market leverage, and increased growth opportunities are all examples of operational synergies that favour the merged firm's operations. They normally express themselves as higher anticipated cash flows. “*Financial synergies, on the other hand, are more focused and include tax advantages, diversification, expanded debt capacity, and ways to put surplus of cash to good use. Higher cash flows and lower discount rates are two examples of how they express themselves*” (Damodaran, 2005).

The synergies can be divided in three types, second Damodaran (2005).

- Operating Synergies: operating synergies are those that enable companies to increase operating income from existing assets, expand, or do both.
- Financial Synergies: financial synergies, is the payoff of M&A, can take the form of higher cash flows, a lower cost of capital (discount rate), or both.
- Fiscal synergies: to maximize value, tax advantages accrue from the tax law and

can be used by the companies. There are three cases of how tax incentives can be used by businesses, they are presented by (Damodaran 2005).

First case: when one of the undertakings has a negative net operating result, while the other undertaking has income on which it pays considerable taxes, the combination of the two undertakings will result in tax benefits shared by the two undertakings. The actual value of the tax savings is the value of the merger or acquisition. Second case: Another advantage is the right to write off a target company's depreciable assets in an acquisition. In the following years, this will result in greater tax benefits from depreciation. Third case: Certain countries are gaining some advantages related to the book value of equity. For instance, businesses in Brazil can claim a rate of return on book equity capital as a tax deduction. However, along the time, the importance of the tax synergy has decreased, Gaughan (2010) refers in his article that the tax loss was a more important for mergers and acquisitions until 1980s. After that, the tax law has been changed for the government to prevent M&A motivation taxes and the importance of tax synergy decrease.

2.3. Economies of Scale

A firm is said to have economies of scale when its average cost decreases as total output increases, which means that the marginal cost decreases when the production by unit. The short-run economies of scale may result from mergers because joining two firms allows them to get rid of double fixed costs, i.e., costs that involve administrative tasks, customer service, billing, etc. (Motis, 2007).

2.4. Economies of Scope

Scope economies are economies of scale generalized to multi-product businesses or multi-product firms. Firms connected to the supply chain. They are done if, when the goods are manufactured jointly, the average cost of manufacturing two products separately falls. Economies of scope exist when the higher the production of say, A the lower the marginal cost of B, provided A and B are related in one way or another within the same firm (Motis, 2007).

2.5. Diffusion of know-how and R&D

If the merging firms have different technological capabilities, human capital, or generational cultures, patents, or simply know-how and it turns out that they are complementary to each other, then, by putting them together, they will most probably achieve technological progress. When combined more efficiently, R&D is a powerful non-tradable asset that can lead to technical development and an expansion of the firms' joint production capabilities (Röller, Stennek, and Verboven, 2006).

2.6. Purchasing Power Cost

If a company increases in size, it can exploit its purchasing power with upstream suppliers to gain volume discounts or simply better prices. This strategy would certainly result in a cost savings for the newly combined company (Motis, 2007).

2.7. Interest Rates

Due to liquidity limitations or asymmetric knowledge in the external capital market, small businesses often cannot borrow at reasonable interest rates. Since a large company has greater access to the outside capital market than a small one, the merger is driven by the prospect of borrowing at a lower cost than individual units (Motis, 2007).

2.8. Types of M&A

M&A Operation is a complex operation that includes many types of M&A like Horizontal, Vertical and Conglomerate. A horizontal merger occurs when one company buys or combine with another in the same sector (Gaughan, 2010). For example, BPI and Caixabank. The horizontal mergers increase the size of the companies and in result of this the market power increases. However sometimes the regulators can be against that because of the excess market power. Vertical mergers are combinations of companies that have a buyer-seller relationship (Gaughan, 2010). A good example is the Time Warner and American online.

Gaughan (2010) define a conglomerate merger as “*when the companies are not competitors and do not have a buyer–seller relationship. One example was Philip Morris, a tobacco company, which acquired General Foods in 1985 for \$5.6 billion, Kraft in 1988 for \$13.44 billion, and Nabisco in 2000 for \$18.9 billion*”

2.9. Mergers Waves

Throughout history, the academics had identified the M&A in various cycles. Many authors have given some reasons for the appearance of cycle of mergers. The deregulation or new technology can create a merger wave, however when a wrong valuation appears the effect can be reverse (Rhodes-Kropf and Viswanathan, 2004). Shleifer and Vishny (2003) refer in their paper that merger increases during periods of high stock market valuations, and the means of payment are usually stock. Therefore, acquisitions where any stock was used as payment represented 45.6% of the total in the 1980s, versus 70.9% in the 1990s. In consequence, market overvaluation raises the probability of a merger taking place. Due to miss evaluation, a wave may also occur. In addition, undervaluation will stop waves, even though assets really should be redeployed. The share of acquisitions that were all paid in stock rose from 32.9% in the 1980s to 57.8% in the 1990s gives one relationship between elevated price of stocks and highly M&A activity. The conglomerate merger wave of the 1960s is the case of prototypical acquisitions by the more overvalued firms over the less overvalued ones. A commonly given reason why these acquisitions took the form of diversification is the antitrust policy restrictions related to acquisitions. It may have been useful for long-term owners of high-valuation bidders, to lift their claim to long-term resources, to issue new stocks to diversify and create conglomerates. Such acquisitions may have been more appealing than those in the same sector because even though potential synergies were higher than those for diversification, target valuations within the industry were too high to justify acquisitions. Harford (2005) shows other factors for Merges Waves, like regulatory and technological shocks. However, whether the shock contributes to a wave of mergers depends on whether there is ample overall liquidity for resources.

Malik et al. (2014) in identify six Mergers waves:

- First Wave: The first wave started from 1897 and lasts until 1904, where its

majority was horizontal M&A. The firms want to get benefit from their manufacturing, as being a single seller in the market, like railroads, light & Power, etc. Most of the deals that were started in the first period of M&A proved to be unsuccessful as the deals failed to accomplish the set goals and objectives.

- Second Wave: Started from 1916 and lasted until Wall Street Crash of 1929. The core objective was to benefit from oligopoly, especially in Hi-tech expansion of railroads and transportation. Most sectors of M&A were the key producers of Ore and mineral, food items, oil & fuel, transport and chemical etc. Banks played a serious role in assisting the deals of M&A. Banks like Investment banks granted loans to the investors on easy installments, however with crash markets in 1929, the majority of M&A failed.
- The third wave of merger happened between 1965 and 1969. Most of the deals were conglomerated in nature. The deals of Mergers and acquisitions were mainly backed from the capital of owners and low levels of debt, the opposite of the former wave. The wave started to move towards the end as consolidation of unlike firms and organizations started to post unsatisfying results in 1968 (Fatima and Shehzad, 2014).
- The fourth wave of merger happened between 1981 and 1989. By the 1980s, hostile mergers had proven to be a tolerable method of business expansion. Organizations and speculative affiliations initiated to take over firms and treated it as mean for taking benefit from lofty profits in short span. Takeovers in the current wave were either believed to be friendly or hostile. It was mainly depended on the response of the board of directors of the target firm. If the board of directors endorsed the takeover, it was well thought-out to be a friendly one, and if the board of directors opposed to the deal, the takeover was supposed to be hostile. The main sectors of this wave mergers were Oil and Gas, Pharmaceutical, banking and airlines.
- The fifth wave of merger happened between 1992 and 2000. This wave gets its inspiration from the worldwide increase in the share market and deregulation. The main sectors of this wave mergers were banks and communications.

- The sixth merger wave (2003-2007) was identified in metals, oil & gas, telecoms banking utilities, and health care centers by merging. This wave was fueled by the acceleration of globalization and some government funding. Buyers of private equity assumed an integral role, representing a quarter of the general acquisition drive, empowered by an easy low interest rate credit.

2.10. Pre-Mergers and Acquisition

The pre-deal phase including many steps, that sometimes could be ignored by studies. The research phase on M&A is divided in four phases (Welch et al., 2020). First phase consists in studies on the strategic motives for initiating M&A. The second phase is the prediction about the competitor's behaviour. The third phase consists of a study on individual executive characteristics and the fourth and last phase studies the role of governance and ownership in M&A initiation. However other academics like Welch et al. (2020) in his analysis, he investigates the effects of merger and acquisition negotiations on subsequent target company top management turnover. The results indicate that the primary impact of negotiations is evident in the fourth year after a settlement date. When a buyer approaches an unrelated company that has been subject to previous takeover interest with a merger proposal, and an agreement is reached, the target's management team is likely to experience abnormally high turnover 4 years later. Additional research ideas are suggested to help explain the sizable turnover rates in the 3 years immediately following a merger or acquisition.

2.11. The Steps of Negotiation Process

In Steps of Negotiation are recognized six steps of negotiation process including Preparation; Presentation; consideration of mutual interest; due diligence; Negotiation and conclusion.

- Preparation Step: In the Preparation Step before the pre-release of the acquisition, the acquiring company makes a swot analysis In this analysis there are strong and weak points of the target company, having into account the opportunities and threats of the environment.

- **Presentation Step:** after identifying the target company, the "buyer" should communicate his intention, search references, and create a good relationship with targets partners like banks, suppliers, and clients for example.
- **Consideration of mutual interest:** this is the stage where all parties involved in the process check whether there are any shared motivations and goals. The buyer company takes some interest in criteria like, the type of M&A, range of products, the required profitability etc. However, the target company also has some concerns like financial guaranties, the analysis of shareholders, analyse the improvement of services etc. After the total confirmation of mutual interest, the companies can write the Memorandum of Understanding, with some objectives like moral compromise to avoid future conflicts. The academics recommend that both parts spend some time thinking about the letter, for analyses of the advantages and disadvantages about the operation. In a buyer perspective, this memorandum should refer the price, interest, and request to due diligence.
- **Preliminary Investigation/Due Diligence:** how it was mentioned before there's a need to do due diligence. Due diligence is a process that involves examine, audit, and analysis to verify facts and/or information about a topic. Due diligence in the financial environment entails a review of financial documents prior to entering a potential contract with another entity. To conclude the due diligence both legal and financial diligences need to be completed and then, both parties need to define the company offer price.
- **The Negotiation:** a negotiation is a strategic dialogue that aims to settle a problem in a way that is agreeable to all parties. Each side in a negotiation tries to convince the other to agree with their point of view. The academics give some recommendations for the negotiation process like be elegant, collect the essential information for the meeting and understand the business motivations. Other psychologic aspects are important because we need to know the personality of the other part to facility the negotiation process and keep the elegance in the process. The target company should be proactive and exigent with the negotiation and not accept low offers. There is also a need to define the principal points of agreement like the structure and terms of payment, after that the negotiators

should talk with the managers to avoid misunderstandings.

- Conclusion: finally, after a successful trading process we can conclude the process and sign the official operation document. In this document should include the future of the operation, contracts with collaborator's, transaction period and every relevant point, so that both parts can close the deal with success.

2.12. The Impact of M&A t in the Share Price

When the M&A intention becomes public, the price of normal shares increases, A. T. Adnan, and Hossain (2016) created a model with the variation on the company value in market between 5 days before the announcement and then 5 days after. In this model the author proved that the market could predict the M&A announcement, because in the third day before an announcement the price of a company has a significant raise and with this information, the author justifies this unexpected increase with a possibility of an information leak.

According to Draney, Y., Frolova, K., & Ochirova, E. (2019) the return of a stock after M&A grows but only in short term, in long term in line with the author "*does not create an additional value*". According to this study the author refers that in the short term the price of shares increase is justified by the investor's overreaction.

2.13. Post Mergers and Acquisition

Most studies about M&A assume that after the six points in the M&A negotiation is concluded the actual M&A is also finalized. However, Shrivastava (1986) in his investigation refers some steps and advice for the conclusion of M&A with success. The structure given for post-merger integration thinking, in managers may use procedural, physical, and managerial/sociocultural elements of integration to define integration criteria in their own organizations. The author refers that the CEO should avoid contested takeovers, if contested takeovers cannot be avoided, the contestant parties should at least be identified and dealt separately as a group of special stakeholders. Some firms use psychologists and professional organizational development consultants to identify and negotiate with dissident groups. Peters (2006) measures the relative significance of other

variables, which by incorporating post-merger information into the model, have also contributed to the observed price changes. The results suggest that supply-side impacts are largely compensated by the uncertain portion of the price adjustment. The author concludes that deviations from the assumed model of a firm operation play an important role in accounting for the differences between the anticipated and real price changes.

2.14. Valuation

Valuation is a very debated topic between investors, finance professionals and academics, especially due to the existence of several valuation methods. Evaluation of a company (or other financial or real asset) is the determination of the overall worth of those business entities (or asset). This representation is expressed in terms of monetary units, Dollar, Euros, British Pound or other currency and results in assigns of a price tag to a business entity using some method and a set of assumptions. Obviously, the value computed from different methods may not be coincident, but if the same assumptions were used to develop the model, it will have to (or at least, should) produce equal results regardless the model used.

The correct approach to choose between the various models that exist should be driven by the data available and be robust due to data imperfections (Young et al., 1999). This evaluation, independently of models and assumptions should be backed up by reality (Damodaran, 2002), that is, the price tag that the valuer places on the asset/company must reflect the cash flows that will be generated in the future. The valuation process is a complex task, and several areas of expertise are needed, Massari, Gianfrate, and Zanetti (2016) consider three key areas for a successful valuation, namely, industrial economic and business strategy, theory and techniques of finance and economic theory. Damodaran (2012) points three main approaches to determine the value of a company/asset, namely, distinguished (valuations such as absolute, relative and contingent claim):

- Absolute valuation: determines the intrinsic value of an asset. Further, it can be compared with the market price of an asset, and it could be determined whether the asset is over or undervalued.
- Relative valuation: consists in comparing target asset with the similar one on the

market and based on this, estimates their asset value.

- **Contingent claim:** in contingent claim valuation the value of an asset depends on whether a certain event occurs, thus in some cases the value of an asset may be greater than the present value of its expected cash flows (Damodaran,2012).

Miller Jr and Segall (2017) describes three perspective of valuation approaches: income approach, market approach and asset approach. Massari, Gianfrate, and Zanetti (2016) distinguish additional approach, namely economic profit approach, thus, it is possible to distinguish four valuations approaches with each own set of methodologies (techniques).

Figure 1:Massari, Gianfrate, and Zanetti (2016)

Income Approach	<ol style="list-style-type: none"> 1) Discount Cash Flow 2) Income
Economic Profit Approach	<ol style="list-style-type: none"> 1) Excess Earnings 2) Economic Value added
Market Approach	<ol style="list-style-type: none"> 1) Stock Market Multiples 2) Comparable Transactions
Net Asset Approach	<ol style="list-style-type: none"> 1) Net Asset Approach 2)Net Asset approach (with intangible valuation) 3) Contigent Claim (Real Options)

A more in-depth description of the most used techniques in the business valuation is presented below.

Although I list several methods below, in my evaluation I will only use two of them, the DCF and the market multiples. We chose the DCF model, because the model allows disaggregate the variables and allow me to apply some assumptions exchanges face to the seasonal conditions, the range can be expanded or contracted, and the skewness can be varied. French and Gabrielli (2005). The method of the market multiple I choose to use because this method because it complements the DCF one. This method uses fewer assumption and is fast to identify the current move market.

2.14.1 Discounted Cash Flow

The Discounted Cash Flow (DCF) technique assumes that a company's value should be determined by its expected future economic benefits. Essentially, it entails projecting a future stream of profits at a discrete time and then a terminal point (or continuing concern value), and then discounting the future stream of earnings back to the present value. The firm's value is then present value of those discounted cash flows for the entire firm.

(Penman and Penman, 2010). Notice that the discount rate used will be proportionally to the risk of the estimated cash flows, leading to higher rates for riskier assets and, on the other hand, lower discount rates for risk free assets (Damodaran, 2012).

This method can be mathematically expressed as:

$$DCF(k, n) = \sum_{i=1}^n \frac{CF_i}{(1+k)^i} \quad (1)$$

Where CF_t is Cash Flow in period t , k is the discount rate and n are the terminal point. Notice that in this formula is assumed that the discount rate is constant in all periods, this was done due to simplicity's sake and don't need to be the case in empirical applications. If multiple discount rates are used the formula needs to be changed to reflect the different capitalization rates of the cash flows.

The discount rate, terminal point, and cash flows must all be determined for DCF computations. In DCF model computations, two types of cash flows can be used: free cash flow to the company (FCFF) and free cash flow to equity (FCFE). Because these two indicators are not line items in the company's financial statements, they must be computed correctly. Let D stands for depreciation, A for amortization, $CAPEX$ for Changes in working capital and T for taxes, then the ways of calculating FCFF, FCFE and the discount rates are given below

Table I:FCFF and FCFE calculation and its discount rate

Cash Flow Type	Calculation	Discount Rate
Free cash Flow to the firm (FCFF)	EBIT*(1-T)+D+A+Capex	Wacc - Weighted average Cost of Capital
Free Cash Flow to Equity (FCFE)	FCFF- Interest expenses*(1-T)+DEBT	r - Required rate of return on equity

Let Property, Plant and Equipment be represented by PPE, so

$$CAPEX = PPE_t - PPE_{t-1} + Dt \quad (2)$$

Calculating free cash flow is a difficult process that necessitates a thorough understanding of a company's financial flows includes factors such as new product development, product life cycles, competition and other value metrics associated with company operation. Short, intermediate, and long-term forecasts are also necessary to develop an adequate representation of the future economic benefits of the company. The weighted average cost of capital (*WACC*) is given by

$$WACC = \left(\frac{E}{V}\right) * K_e + \left(\frac{D}{V}\right) * K_d * (1 - T) \quad (3)$$

Where (E/V) and (D/V) are the weights of equity capital and debt capital, respectively, in the firm and K_e and K_d is their associated cost. One may use their average or specific weights. The nature and time horizon of the companies financing are given below.

Table II: Nature and time horizon of the companies financing

Nature of Source			
		Intern	Extern
Time Horizon	Short	1) Shareholders Contributions 2) Supplementary Capital subscriptions	1) Suppliers/Clients 2) Banks 3) Factoring 4) Financial Markets
	Long	1) Self - Financing 2) Shareholders	1) Risk Capital 2) Banks 3) Financial Markets 4) Leasing 5) Leaseback

The cost of the debt is the creditor's expected return from the borrowings granted to a company, that is, the interest rate paid by the company on its borrowings. The cost of the equity can be obtained from the return of a risk-free asset plus a risk premium, that is

$$K_s = R_f + Risk\ Premium \quad (4)$$

where the risk premium is $\beta(R_m - R_f)$. The variables R_m and R_f are easily determined from the market.

The calculation of β presents more difficulties. If the company is public traded one could use the CAPM model to obtain their value. If the company is not public traded one could use one of the following approaches:

- Pure-Play Method: in this method the beta used is obtained from other listed companies that develop a similar business area than the one we are trying to evaluate; we could also use the beta for the whole company business sector. This method presents some problems:
 1. Survivorship bias (the companies that will be used are those that were relatively successful in the investments);
 2. Different capital costs between the two companies even if they have the same debt ratio.
- Accounting beta: perform the regression between the variations verified in the accounting results of the target company and the variations in the aggregated results of all the companies in the market. The results are used as a proxy for potential market returns. Some of the problems for this method are
 1. Usually, the results are measured only once a year, leading to regressions with few observations and limited statistical power.
 2. Results are often smoothed and subject to accounting decisions, leading to an incorrect assessment of the accounting beta.
- Top-down methodology: first, the normal risk of investing in stocks is estimated, compared to investments without risk. Then, an adjustment is made that considers the risk level of the whole company. This gives the company's cost of capital. Finally, an adjustment is introduced that considers the specific risk level of the investment in relation to the company's average risk level, thus obtaining an estimate of the cost of capital of a specific project.
 1. This last method also presents some technical difficulties, usually the values of the betas obtained from the financial markets are used.

Hamada's equation (Hamada 1972) should also be presented here since it is used to separate the financial risk and business of a levered firm, it can be used to determine the cost of capital of a levered firm based on the cost of capital of comparable firms. Let β_L be the leverage beta, B_U be their unleveraged counterpart and T stand for taxes, thus Hamada's equation is given by

$$\beta_L = B_u * [1 + (1 - T) * \left(\frac{D}{E}\right)] \quad (4)$$

Finally, to compute the firm's fair value, it is necessary to add all the free cash flows along with the terminal value. The terminal value can be calculated with or without constant growth and should be discounted using the discount factor from the last period in the series of cash flows.

$$Terminal\ Value = FCF_t * \left(\frac{(1 + g)}{(Wacc + g)}\right) \quad (5)$$

where FCF denotes free cash flow and g denotes the terminal growth rate, i.e., the rate at which the corporation will expand in perpetuity. Typically, the terminal growth rate falls somewhere between the historical inflation rate (2-3% per year) and the average GDP growth rate (4-5 %). If the terminal growth rate is greater than the average GDP growth rate, the firm will beat the overall economy's growth in perpetuity. According to Adsera and Vinolas (1997), the main advantages of this method are:

- Pure-Play Based on financial flows rather than accounting
- Based on financial flows rather than accounting terminology
- The balance sheet and the income statement give information
- It gives a more accurate picture of the present state and variables that may impact a company's worth
- The Time Value of Money is considered
- A detailed and comprehensive review of a company's risk

According to Penman and Penman (2010) the main disadvantages of this method are:

- Difficulties estimating cash flows at the start of the firm's life cycle because one must estimate when positive cash flows will occur, as well as the rate of return they will generate.
- This technique does not quantify short-term value added since value is not recognized after it has been generated. When a company spends extensively and experiences negative free cash flows as a result, the value produced by investments is not recognized.
- Continuing value is given too much weight in valuation, which means that discounted cash flow does not anchor valuation on what we already know. The short-term cash flow estimates may be quite reliable, but there is no real clarity regarding the valuation.

2.14.2 Business Valuation Using Economic Value Added

Economic value added (EVA) measures the surplus value created by a company on its existing investment. Thus, it is possible to calculate company's intrinsic value using EVA. According to Damodaran (2012), the formula for company's value using EVA is the following:

$$\text{Value of business} = \text{Capital Invested in firm today} + \text{Present value of excess return cash flows from both existing and future projects} \quad (6)$$

Cash flows of investments that exactly yield the required rate of return are considered as normal returns. By means of these two types of returns, a company can be valued in the following way (Damodaran, 2005):

$$EVA = (\text{Return on invested Capital} - \text{Cost of Capital}) * \text{Capital invested} \quad (7)$$

$$= \text{After tax operating income} - (\text{Cost of Capital}) - (\text{Capital Invested}) \quad (8)$$

$$Firm\ Value = Capital\ Invested * \left(\frac{EVA_t}{(1 + K_t)} \right) \quad (9)$$

The terminal value for EVA should be determined in this equation, thus we must also estimate the company's terminal growth. Following that, the terminal value is computed. Both the series of EVA and the terminal value should be discounted using the cost of capital, that is, the present value should be computed. Thus, the EVA model for calculating a company's worth takes the same approach as the DCF model. The sole distinction is that capital invested should be included after computing the sum of present values for predicted series of EVA and terminal value. According to the EVA model, the resultant number indicates the company's worth.

2.14.3 Market Approach Multiples

Through this method an investor can see what the market thinks about the company adjusted by the market variation and thus is this approach its very used in the listed companies since it allows the comparison between several entities. Although it is recommended that investors choose the companies with same economic conditions; geography; sector, the level of the debt and technological innovation to avoid maladjustments. For Penman and Penman (2010) the valuation by multiples works in 3 steps:

1. Identify comparable operations with the same types of company (size, market share, geography).
2. Recognize averages for comparable companies in their financial statements, which are used to calculate multiples.
3. Calculate and apply the median or average of multiplies in our search for calculate the company in question

The multiples approach allows the estimation of fast and simple companies values when we have a multiples company for valuation. To do implement this approach is necessary to follow a set of rules to ensure that the best practices of valuation are being followed. Koller, Goedhart, and Wessels (2010) recommended the following set of guidelines:

1. Select the comparable companies with similar Returns of Capital and

expectations of growth up

2. Use of multiples predictable multiplies
3. Use of multiplies based of EBITDA to avoid the problem of different capital structure.
4. Adjusted of multiples for non-operational items

However, even following those guidelines it is easy manipulate this method, and we could also have two companies exactly equal and the comparison still be wrong (Damodaran, 2005). This method also present some drawbacks, it is difficult to identify the comparable companies since the companies are comparable by size, sector, or product and it's almost impossible found two companies equals exactly. Sometimes the comparable companies dominate the market and have the higher multiple, making the comparison inaccurate. Finally, there is also the possibility of negative multiples. The wrong use if this method can create some mistakes with the valuations and thus is recommended the use of more types of valuation like a complement.

We can classify the multiples approach in two ways: The Capital Market Approach and the Transaction Approach:

- Capital Market Technique: the valuation of the subject firm is established using this approach by comparing it to other comparable publicly listed companies (also known as "guideline companies").
- Transaction Technique: using this approach, the valuation of the subject firm is calculated by comparing it to other comparable non-publicly traded companies that have previously been purchased or sold (also known as "guideline companies"). In this scenario, it is critical to evaluate transactions completed within a reasonable amount of time to reflect the most recent market circumstances under which the transaction's value was calculated.

Kaplan and Ruback (1995) point out that it doesn't exist a correct method to determine the value of a company, however if we use the EBITDA Multiple, we should arrive a value like the valuation by Discounted Cash Flow.

2.14.4 Net Asset Based Approach

The core concept is that the company's worth may be calculated by revaluating the company's assets and obligations, resulting in a net value, which is also the equity. Except for liabilities, which are frequently accounted in real value, this revaluation of the balance sheet values is due to the book not matching the real value. The core concept is that the company's worth may be calculated by revaluating the company's assets and obligations, resulting in a net value, which is also the equity. Except for liabilities, which are frequently accounted in real value, this revaluation of the balance sheet values is due to the book not matching the real value. The items to value are those on the balance sheet; financial assets, tangible personal property, real estate, intangible real property, intangible personal property, current liabilities, long-term liabilities, contingent liabilities, and special obligations (Pratt, Niculita, et al., 2000). The appraiser should not forget off-balance sheet assets, business items which are not related to the core operations and tax-adjustments (Lundén and Ohlsson, 2007).

The most simplistic version of this method is the one where the asset value represents the Net Asset Value (NAV) per share attributable to ordinary shareholders. This value is estimated as follows

$$NAV = \left(\frac{\text{Total Assets} - \text{Liabilities} - \text{Preference Shares}}{\text{Number of Shares Issues}} \right) \quad (10)$$

where

$$\text{Asset Value} = \text{Company Assets} - \text{Company Liabilities} \quad (11)$$

This formula is very simple, yet it suggests a key financial notion. After all third-party liabilities have been paid, the company's worth is what remains for the shareholders/investors. The *Company Value* must be positive for this value to be meaningful, if the *Company Liabilities exceed the Company Assets*, the approach is useless (Lundén and Ohlsson, 2007).

The model can be applied for valuing small private companies where the cash flow is difficult to forecast. It is also practical when assets are expected to be a big part of the company value, for instance, companies like real estate, forestry, and investment since

market value of these companies' assets is often easy to estimate (Lundén and Ohlsson, 2007). Vice-versa the asset-based approach is not appropriate when the company assets consist mostly of intangible assets. Additionally, the model can be applied when a company presents a negative result. Finally, the value obtained by the model could be used as a comparing value with the value obtained by other models, not as a definite value.

Advantages of Asset Approach

1. Relatively straightforward to implement
2. Doesn't rely much on guessing and assumptions
3. Results of the model are presented in a traditional balance sheet format.
4. Usefulness in negotiating the selling or purchasing price since the company's assets and liabilities are understood exactly how much they are worth
5. The only model that may be used when purchasing a firm and then intends to close it down

Disadvantages of Asset Approach

1. Don't account for different efficiency in the usage of assets.
2. It does not examine the surplus value produced by the assets in possession; in other words, it does not notice the synergy effect and does not analyse the company idea and prospects (Lundén and Ohlsson, 2007).
3. Can be costly and time-consuming, depending on the requirement for expertise in various asset assessment circumstances (Pratt, Niculita, et al., 2000).
o Requires full access to all the company's internal information (Holmström, 1999).
4. Static viewpoint in time since it does not account for the company's future growth, particularly non-tangible assets, therefore future utilization is not readily apparent (Mard and Mehm, 2009).

2.14.5 Contingent Claim

Real options can be defined as an investment decision that is characterized by

uncertainty, the provision of future managerial discretion to exercise at the appropriate time, and reversibility (Kogut and Kulatilaka, 2001). This needs to evaluate real options arises from some cases as patents, reserves of natural resources or exclusive licenses. Not all opportunities are options and not all options have significant economic value. These examples are contingent claims that need to be evaluated since the value of a firm is value of its capital in place plus the value of its growth options.

In contingent claims valuation the value of an asset depends on whether a certain event occurs. In other words, the value of the asset is contingent on the occurrence of a certain event (Damodaran, 2005), but with uncertainty and irreversibly, the net present value rule is often wrong, and we need option theory to obtain better answers. An option is a contract between two parts that agree to buy/sell an asset at a previously agreed price (strike price) at said given price or until a previously agreed date in the American Case. If we have a call option, we have the right to buy an asset at a previously agreed price (strike price) at or until a previously agreed date in the American case. If we have a put option, the essence is the same except that, in this case, we have the right to sell an asset. However, in this case, we must evaluate options in real assets. As said before a traditional option pricing model such as Black-Scholes-Merton model and binomial models can be applied to evaluating real options.

There are six crucial factors to be computed that affect the value of an option, the current price of the underlying stock, the dividend yield of the underlying stock, the option strike price, the risk-free rate over the life of the option contract, the time remaining until option expiration, and the price volatility of the underlying stock (Deev, 2011). The value of the options, which in the case of real options is a project, investment, or acquisition. If the value of the asset goes up, so does the value of the real option. Second variable is the dividends that may be paid out by the underlying asset. An increase of the dividends paid out will increase the value of the call option and decrease the value of the put. Third, the exercise price. If the exercise price increases, the value of the call option decreases and the put option increase. Fourth, the risk-free rate of interest over the life of the option. As the risk-free rate goes up, so does the value of the call option and the reverse in the case of put options. Fifth, the time to expiration of the option. If this time increases, so does the value of the option. The final variable is the uncertainty about the present value. In an

environment with managerial flexibility an increase in uncertainty will increase the value of the real option. Having these variables identified, it is possible to start valuing real options.

Amram, Kulatilaka, et al. (1998) organize these solution methods in three groups: the partial differential equation approach, the dynamic programming approach, and the simulation approach. The partial differential equation approach consists in expressing mathematically the value of an option and its dynamics by a partial differential equation and boundary conditions. This approach can be solved with analytically or by numerical solutions. To do this we need to assume that the price follows a geometric Brownian motion, thus the Itô calculus can be used to compute the total differential of a function stochastic variable and the out-come of that analysis was a partial differential equation for the value of the real (or financial option). The dynamic programming approach optimizes the decision that influences future payoffs, this is a handy tool for option valuation because intermediate values and decisions become visible, providing the user valuable information about the option and how to deal with complex decision structures.

In Monte Carlo simulation method, which is the method frequently used, the optimal investment strategy at the end of each path is determined and the payoff calculated. This method can handle many real-life situations (for example, complicated decision rules and complex relationships between the option value and the underlying asset) and are computationally less arduous. In a more practical basis, several limitations in the use of real options valuations such of the estimate of the volatility factor, general technical complexity, makes this approach not very popular in practice, but still has potential to has potential to evaluate business with flexible growth rates witch other approach do not fully capture.

3 MERGER VALUATION

In this chapter, I will evaluate the merger between Arrow Global and Norfin S.A. that occurred in 2018. This was a horizontal M&A, in which the companies operate and compete in the same sector, the asset management sector, despite operating in different geographies.

3.1 Company Description

3.1.1 Arrow Global Description

Arrow Global, was founded in 2005, focuses on asset management, recovery, and management of non-performing and non-core assets. The company discovers, purchases, and manages credit portfolios with and without collateral from financial institutions, presently has €60 billion in assets under management, including a discretionary fund of approximately €2 billion launched in 2020. Arrow Global operates under the Capquest and Mars Capital brands in the United Kingdom; Whitestar Asset Solutions, Norfin S.A, and Hefesto in Portugal; Vesting Finance in the Netherlands; and Zenith Service, Europa Investimenti, Whitestar Italy, and Sagitta SGR in Italy. Over the last few years made several investments in quite a few countries in Europe including Portugal when they entered in 2007. Despite Portugal being a small market, it has been proving to be very attractive to international investors specialized in asset management due to their growth rates, especially "*toxic as- sets*" such as debt more precisely credit non-performing, similarly the Portuguese real state asset class has also been attractive due their price growth. Due to Portugal being an important market for the asset management Arrow Global to strengthen its team when they hired the former Finance minister Maria Luis Albuquerque and later did the acquisition of Norfin S.A and Whitestar.

3.1.1 Norfin S.A Description

Norfin was created in 1999 as a Real Estate Private Equity firm with the goal of allowing Portuguese institutional investors to include indirect real estate investment in their asset portfolios by participating in regulated real estate investment funds. In 2018, the

firm was acquired by Arrow Global group. Norfin is a Portuguese reference in real estate investment and management, with €1.6 billion in assets under management including national and international SPV.

3.2 Macroeconomic Overview

3.2.1 M&A Activity

According to the Institute of Mergers, Acquisitions and Alliances (IMAA), since 2014 the M&A activity has grown in recent years and has remained constant. According to the latest data, the number of businesses in the world in 2021 was around 10,000. But when we talk about business value, we have a value around 1521 billion dollars in 2021. These values compared to 2020 suffer a big drop due to the Covid-19 impact but it is expected that in 2022 the M&A activity will reach the values pre-pandemic. Portugal in the last's years follow the Europe trend in M&A activity, in fact it is possible to say that M&A activity in Portugal has been growing faster than the European Average with two big transactions in last three years like the case of Brisa being sold to a consortium composed by asset management entity from Netherlands; South Korea's national pension service and Swiss life. Other big transaction was between a consortium composed by Engie, Credit Agricole and Natixis group and EDP that result in a sell of dams. The value of transaction was around 2.2 thousand million euros. This transaction created some controversy in political spectrum about excessive fiscal planning, that the left leaning parties launched some critiques about this business. See figures 2 in attachment

3.2.2 The Now-Performing Market

It was in the 1980s that some banks in USA began to sell their NPL portfolios from their balance sheets, the less risk-averse investors were seen this type of assets like an opportunity to obtain a highest return (Pina, 2014). On the other side of the Pacific, the Asian banks only started to practice this type of transaction in the 1990s. In Europe, the transactions of this type of assets began to gain importance after the 2008 financial crisis with the fall of Lehman Brothers. In Portugal, in 2015, with the Non-performing Loans ratios reaching records around 17%, banks had great difficulties to maintain the liquidity requirements imposed by the regulators. It was when the necessity and importance of this

transactions increased for the Portuguese banks. The banks started to offer more NPL portfolios and attracted the investors' attention. See figures 3.

3.2.3 Macroeconomic overview

The year 2022 is expected to be the turning of the page of the pandemic, with the years 2020 and 2021 being marked by individual restrictions under the pretext of stopping the pandemic, or containing the pandemic, thus changing the behavior patterns of economic agents mitigating the economic growth (Akyüz, 2017). With the crash of the world economy around -3.4% in 2020 and with the decrease of world trade around -4.6%, 2021 was a year of recovery with growth in the world GDP around 5.5% and the volume of world trade around 9.5%. As for 2022, it is expected that the world economy will increase around 4.1% and the volume of world trade in the order of 5.8% (Akyüz, 2017). The Portuguese economy, followed the trend of Rest of the world the Covid-19, deeply affected the economic activity with a decrease of GDP around 8.4% in 2020. In 2021, although of the restrictions against the freedom of economic agents, with the efforts by the governments and central banks with the expansionist politics 2021 it was a year of economic recovery. For example, in the portuguese case we have the famous Plano de Recuperação e Resiliência (PRR). Portugal in 2021 registered a GPD growth around 4.5% and is expected to follow the same trend for the next years, the same will happen for the Euro Area and United Kingdom. The inflation rate as expected to be higher than the target value set European Central Bank of 2%. In 2021 the inflation rate was 5,3% on the European Union (E.U.) while Portugal it only reaches 2.8% and in the United Kingdom (U.K.) it reaches 2.1%. While in the 2022 the predictions point for an inflation of 5,4% in E.U, 5,8% in Portugal and 10% in U.K. In 2023 it is expected that inflation rates will return to normal, being around 2,3%. When we talk about public finances, it is obvious that they were affected during the Covid-19 crisis, with the expense drastic increases in health and to support the companies that went into lay-off, the public debt increased a lot, affecting the recovery of public finance balances in several governments. In 2020, Portugal reached a deficit around 5.87% of GDP and a debt ratio around 135.2%. United Kingdom, on the other hand, reached a deficit of 13.07% and a public debt of 102.3%. As for the remaining countries in the Euro Area, the deficit is around 7.2% of GDP and the Public Debt reached 99.5%. Following the inflation pattern, it is expected that in the

following years, Portugal, E.U. and U.K. will return to normal, following the recovery trend of the other world countries. See figures 4, 5, 6.

3.2.4 The Real Estate Market

Real estate assets have had a big importance for investors, for grown and growing up economics around the world especially the ones very dependent on tourism. In terms of the Portuguese GDP, we can observe that from 1995 to 2002, most of this contribution was provided by residential investment, which accounted for around 16 percent of GDP, followed by the value of imputed rents, which accounted approximately 5 percent. After 2005 the real estate market decreased his dynamics, mainly due to the slowdown of the world economy, especially in Portugal where the real estate market is of big importance, this intensified in 2008 with the financial crisis in USA that spread to the rest of the world. The Portuguese case is not an exception, create a liquidity was a difficulty in Portuguese banks and with the increase of interest rates it became difficult to grant credit. With difficulties to get credit the investment in residential assets reached the minimum value in 2014, around 7,5 when troika go out of Portugal. However, in the European Union the value of the real estate investment remained constant. Although Portugal's real state value has been slightly lower than the European Union average, there are disparities in each component's weight in terms of the overall amount of the housing market's contribution to GDP during the previous years. There is one notable difference in the Portuguese case: the proportions of each parcel remained virtually stable over the time in question, with minor modifications after the 2008 financial crisis.

The housing components with the most weight in this European scenario are residential investment (11%) and imputed rents (7%), and the remaining is composed by utilities and similar services. Rodrigues (2022) identified that the Portuguese residential investment has a highly correlation with the GDP around 0.81, even higher than the nonresidential investment. See figure 8

As shown in the graph above, the value of the real estate market decreased between 2006 and 2014, after that with the liquidity measures applied by European Central Bank the banks increased liquidity levels by granting more credit to households. With the recovery of the banks and economies, especially ones affected by highly public financial

debt and/or highly correlated with the residential market, the demand for real estate market had a significant rise and consequently also their prices.

3.3 The Acquisition

The acquisition of Norfin S.A. can be attributed essentially to three factors:

- Economies of Scale or business expansion: It allows the acquiring company to consolidate its activity in Portugal by operating through the structures previously held by Norfin S.A, helping to expand its activity in the Portuguese market, thus consolidating its position.
- Diffusion of skills: Arrow Global has increased its knowledge of the Portuguese market due to the accumulated experience brought by the human capital obtained in the acquisition, later reinforced with the acquisition of whitestar and the hiring of former Minister of Finance Maria Luis Albuquerque.
- Power of purchase: The acquisition allowed an increase in size and global presence for Arrow Global. This increase in size allows a greater access to the outside capital market thus allowing for a borrowing at a lower cost than individual units (Motis, 2007).

3.4 Valuation Methodology and Data

For this valuation we will use two methods, the discounted cash-flow (DCF) method, and the transaction multiples method. These are widely used in the M&A industry. To apply the DCF procedure for a pre-merger a forecast of both company's growth in perpetuity was done. For post-merger a forecast of the next 3 years after 2021 was made based in a set of reasonable assumptions.

For market multiples valuation a sample of 8 similar companies was retrieved from Reuters. This sample can be seen in appendix XI.

3.5 Deal Valuation

On this section, I start by determining a valuation interval for both Arrow Global and Norfin S.A. For each company financial forecasts be done and then defined the valuation

interval based on the outputs yielded by implementing the two valuation techniques, namely:

- WACC based Discounted Cash Flows.
- Market Multiples.

Additionally, potential synergies generated from the business combination will be valued and this chapter will conclude by comparing the real bid of Arrow Global made for Norfin S.A. With the theoretical bid it could have been made according to the valuation outputs obtained in this chapter.

3.6 Discounted Cash Flow Valuation

To compute the valuation based in the DCF for Norfin S.A: we start by finding the value for WACC, to obtain this we need to find the cost and the weights of each financing instrument that was retrieved from Damodaran (2012), from the debt-to-equity ratio. For the cost of equity, we retrieve the risk-free rate from triple A Euro-bond, the market risk premium, the tax rate and the unleveraged beta from Damodaran (2012) and thus the unleveraged beta can be computed using Hamada's equation. For the cost of debt, the reference value from the sector was used. Table IV contain with the assumptions and reference values used in the computation of WACC for Norfin S.A.

For Arrow global the same approach was done but the cost of debt as obtained from their bonds issued in 2018 and 2022. Table V contain with the assumptions and reference values used in the computation of WACC for Arrow Global.

3.6.1 Before Merger

Norfin and Arrow Global FCFF valuation forecast was based in a growth rate of 2% in perpetuity for all items in the income statement. The resulting income statements can be seen in Table XIII for Norfin S.A. and in Table XIV for Arrow Global. Those income statements in junction with their respective *WACC* for 2018 in Tables XI and XII it yields the following valuations for both companies.

Table III: FCCF before the Merger

Company	Valuation
Norfin S.A	46,786,785.70 €
Arrow Global	1,147,083,873.40 €

Thus, we can put a price tag around €47 million for Norfin S.A. and €1.2 billion for Arrow Global, applying the exchange rate on that date.

3.6.2 After Merger

Norfin S.A and Arrow Global FCFF valuation forecast was based in the forecast for the cash-flows in Table XV, Table XVI, Table XVII and Table XVIII, Table XIV, Table XX. Those income statements in junction with their respective WACC for 2022 in Tables XI and XII yields the following valuations for both companies.

Table IV:FCF of Norfin S.A After the Merger

Company	Scenario	g	Value
Norfin S.A	Pessimistic	1.70%	41,644,428.98 €
	Moderate	2%	46,250,843.13 €
	Optimistic	2.15%	48,446,267.06 €

Table V:FCF of Arrow Global After the Merger

Company	Scenario	g	Value (000'€)
Arrow Global	Pessimistic	1.70%	2,347,387.79 €
	Moderate	2%	2,640,093.34 €
	Optimistic	2.15%	2,821,511.71 €

After the Merger According my Forecast the value of Norfin S.A amounts between €41.7 million and €48.5million.

In Case of Arrow Global after the merger the value of the company amounts around €2.4 billion and €2.8 billion, converted at current exchange rate.

3.7 Multiple Valuation

To validate the results obtained with the DCF methodology a multiples evaluation can be conducted using the Market and Transaction Multiples to value both businesses. Due to the actuation area of the acquiring company, we use two metrics, the Share Price to Earnings (P/E) and the Share Price to Book Value (P/B). A range of values for company's Enterprise Value is obtained using the first quantile, the average, the median and the third quantiles of the multiples obtained from a selected sample of companies (additional detail can be found on the Annexes).

3.7.1 Before Merger

To obtain a thorough analogical benchmark valuation, a representative peer group of companies with similar business activities, similar risk/return profiles and capital structures. In this analysis a group of eight competitors was selected and their multiples computed (the sample used can be found in Table XI). Using that sample we obtain the valuations in Table XII and Table XIII for Norfin S.A. That is summarized in the following table

Table VI: Multiple Valuation of Norfin Before the Merger

	Price earnings (000)	Price to book (000)	Average (000)
First Quantile	31,970.01 €	37,945.00 €	34,957.51 €
Median	43,412.37 €	39,200.34 €	41,306.36 €
Average	45,478.31 €	53,618.85 €	49,548.58 €
Third Quantile	50,364.52 €	41,859.56 €	46,112.04 €

Looking at this table we can set an approximated price interval between 32 million euros and 52 million euros with a valuation of 49 548 580 € if the average of averages and a valuation of 41 306 360 € if average of medians is used. Thus, we can put a price tag on Norfin business around these two previous mentioned values before the merger using the market multiples.

Looking at Table XXII and Table XXIII for Arrow Global their valuation is summarized in the following table:

Table VII: Multiple Valuation of Norfin Before the Merger

	Price earnings (000)	Price to book (000)	Average (000)
First Quantile	692,270.95 €	656,878.82 €	674,574.88 €
Median	940,041.00 €	678,610.48 €	809,325.74 €
Average	984,776.29 €	928,214.18 €	956,495.23 €
Third Quantile	1,090,581.24 €	724,645.15 €	907,613.19 €

Looking at this table we can see that their minimum evaluation is around 631 million euros and a maximum valuation 1 090 million euros. Thus, we can put a price tag on Arrow business before the merger using the market multiples around 913 157 790 € if the average of averages is used or 767 956 980 € if the average of medians is used.

3.7.2 After Merger

To obtain a thorough analogical benchmark valuation, a representative peer group of companies with similar business activities, similar risk/return profiles and capital structures. In this analysis a group of eight competitors was selected and their multiples computed (the sample used can be found in Table XI). Using that sample we obtain the valuations in Table XIX and Table XX for Norfin S.A. That is summarized in the following table.

Table VIII: Multiple Valuation of Norfin S.A After Merger

	Price earnings (000)	Price to book (000)	Average (000)
First Quantile	29,079.75 €	37,945.00 €	33,512.38 €
Median	39,487.66 €	39,200.34 €	39,344.00 €
Average	41,366.82 €	53,618.85 €	47,492.84 €
Third Quantile	45,811.30 €	41,859.56 €	43,835.43 €

Looking at this table we can set a approximated price interval between 29 million euros and 54 million euros with a valuation of 47 million euros if the average of averages and a valuation of 47 492 840 € if average of medians is used. Thus, we can put a price tag on Norfin business around these two previous mentioned values after the merger using the market multiples.

Looking at Table XXV and Table XXVI for Arrow Global their valuation is summarized in the following table

Table IX: Multiple Valuation of Arrow Global After Merger

	Price earnings (000)	Price to book (000)	Average (000)
First Quantile	288,550.63 €	475,004.75 €	381,777.69 €
Median	391,825.53 €	490,719.43 €	441,272.48 €
Average	410,471.97 €	671,213.83 €	540,842.90 €
Third Quantile	454,573.33 €	524,008.20 €	489,290.76 €

Looking at this table we can see that their minimum evaluation is around 289 million euros and a maximum valuation 671 million euros. Thus, we can put a price tag on Arrow business before the merger using the market multiples around 540 842 900 € if the average of averages is used or 441 272 480 € if the average of medians is used.

Table X: Valuation Summary

Merger	Method	Multiple	Scenario	Norfin S.A	Arrow Global		
Before	FCFF	-		46,786,784.70 €	1,147,083,873.39 €		
	Market multiples	Price/Book Value	Minimum	37,944,998.41 €	656,878,815.21 €		
			Maximum	53,618,848.49 €	928,214,182.21 €		
		Price/Earnings	Minimum	31,970,012.86 €	692,270,945.97 €		
			Maximum	50,364,523.29 €	1,090,581,237.50 €		
After	FCFF	-	Pessimistic	41,644,428.98 €	2,347,387,788.61 €		
		-	Moderate	46,250,843.13 €	2,640,093,338.66 €		
		-	Optimistic	48,446,267.06 €	2,821,511,713.77 €		
	Market Multiples	Price/Book Value	Minimum	37,512,394.14 €	475,004,749.78 €		
			Maximum	53,007,549.40 €	671,213,829.94 €		
		Price/Earnings	Minimum	29,079,752.39 €	288,550,633.87 €		
			Maximum	45,811,300.52 €	454,573,327.39 €		
		Δ	FCFF	-	Pessimistic	-5,142,355.71 €	1,200,303,915.22 €
				-	Moderate	-535,941.56 €	1,493,009,465.27 €
-	Optimistic			1,659,482.36 €	1,674,427,840.38 €		
Market Multiples	Price/Book Value		Minimum	-432,604.27 €	-181,874,065.43 €		
			Maximum	-611,299.09 €	-257,000,352.27 €		
	Price/Earnings		Minimum	-2,890,260.47 €	-403,720,312.10 €		
			Maximum	-4,553,222.77 €	-636,007,910.10 €		

4 CONCLUSION

This final work of master's degree aims to study the theme of M&A operations, throughout the case study of the acquisition of Norfin S.A by Arrow Global, and its surrounding concepts. In this work is approached a literature review that as we proceeded, we will realize that we have several factors that determine the success of a merger looking at its negotiation and integration together with the gains or losses of synergy.

Firstly, during the literature review I display to the reader, the various types of M&A transactions, how to generate synergies and what is the reaction of the markets to this type events. According to empirical studies the market overreacted to the M&A transactions. According to Dranev, Y., Frolova, K., & Ochirova, E. (2019).

Secondly, we show that in financial terms there are several approaches to do a valuation of a company. Choosing two of them to do this M&A operation.

According FCFF method exception in optimistic scenario the value of Norfin S.A has been decreasing since 2018 (M&A date) that can be justify by the high premiums paid by this type of operations David King, Hema Krishnan;Xavier, Marianna Makri and Mario Schijven (2009), diseconomies of scale Mahabubur Rahman Mary Lambkin (2015) overconfidence of the CEO Luc Rennebooga, Cara Vansteenkisteb (2019).

According to the FCFF method, Arrow Global has been increasing its enterprise value since 2018. This growth comes from the significant increase in leverage, low cost of Debt and the acquisitions of multiple companies across Europe that added value to the company.

When using the enterprise value to estimate the value of Arrow Global, it is shown that it has been decreasing significantly. The reduction of the enterprise value is explained by the higher leverage which translates in less Equity and in negative results in 2020, which can be explained by the Covid-19 impacts.

The Price to Earnings Multiple was not an exception and it originates a significant decrease of the enterprise value mainly due to the negative results of 2020.

The synergies from the acquisition of Norfin S.A by Arrow Global according to this analysis didn't create value in the medium term that prove the theory of Dranev, Y., Frolova, K., & Ochirova, E. (2019), the Covid- 19 crisis explains the difficulty to create profit for Norfin S.A.

According to the FCFF calculated for Arrow Global the company doubled in value, however, this value is not due to the acquisition of Norfin S.A, as the value of Norfin S.A in general decreased.

The difference in results between the FCFF method and market multiples for Arrow Global, results essentially from three factors:

1. Arrow Global increased leverage, which increases enterprise value using the FCFF method.
2. The significant decrease in Arrow Global equity leads to a drastic reduction of the multiple's valuation (price book value for equity).
3. Penalization of the results in the company against Covid-19, which leads the multiple of price to earnings to decrease

The limitations of the dissertation mainly concern the difficulty in collecting financial data from the companies. With this limitation, it was necessary to use the forecast and make some assumptions. A sample with more detailed financial data could give a much more rigorous assessment.

This work helps understanding the M&A processes. However, the topic could have been further developed in relation to tax synergies and post integration. Tax synergies can be a way to reduce acquisition costs as it may be possible to share tax benefits due to the negative results of one of the companies, which may have an impact on the value of the synergies. As for post-merger integration, this issue could be studied in this merger as mergers often do not create value because there are significant deviations between the value observed after the merger and the value predicted before the merger (Peters, 2006).

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6 APENDIX

6.1 Figure

Figure 2: Deal values and Number of Deals

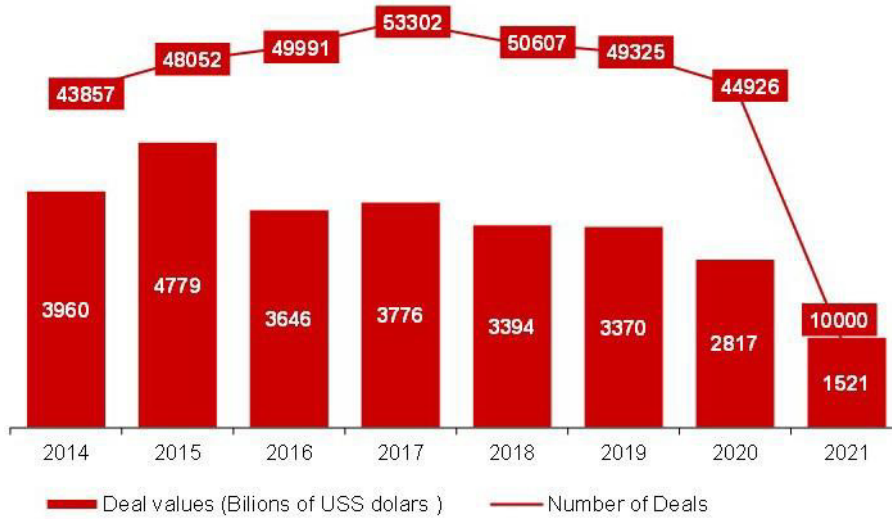


Figure 3: NPL by Target Area

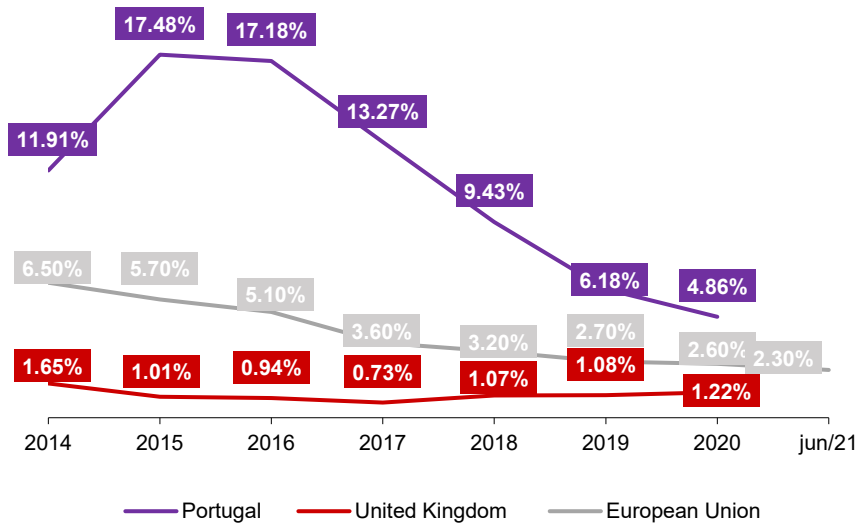


Figure 4: GDP evolution of United Kingdom European Area and Portugal

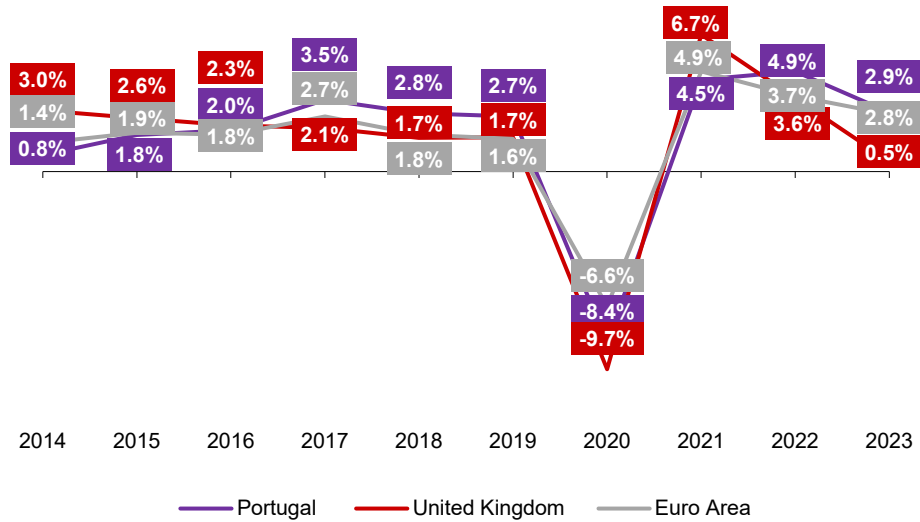


Figure 5: Inflation evolution in United Kingdom European Area and Portugal

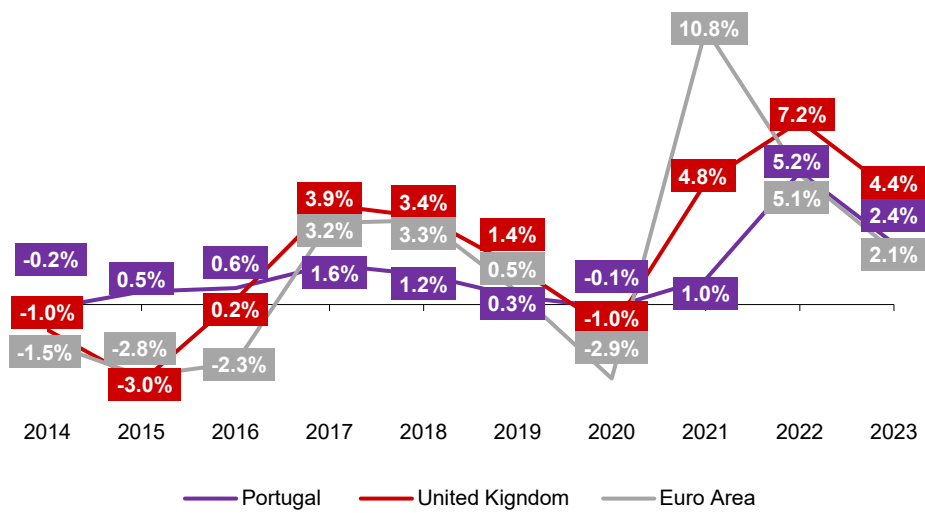


Figure 6: Public Debt evolution in United Kingdom European Area and Portugal

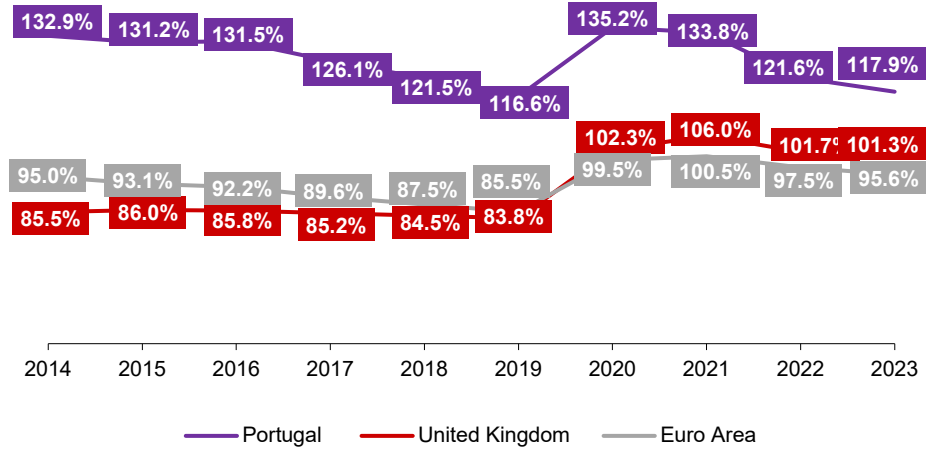


Figure 7: Long term yield evolution in United Kingdom European Area and Portugal

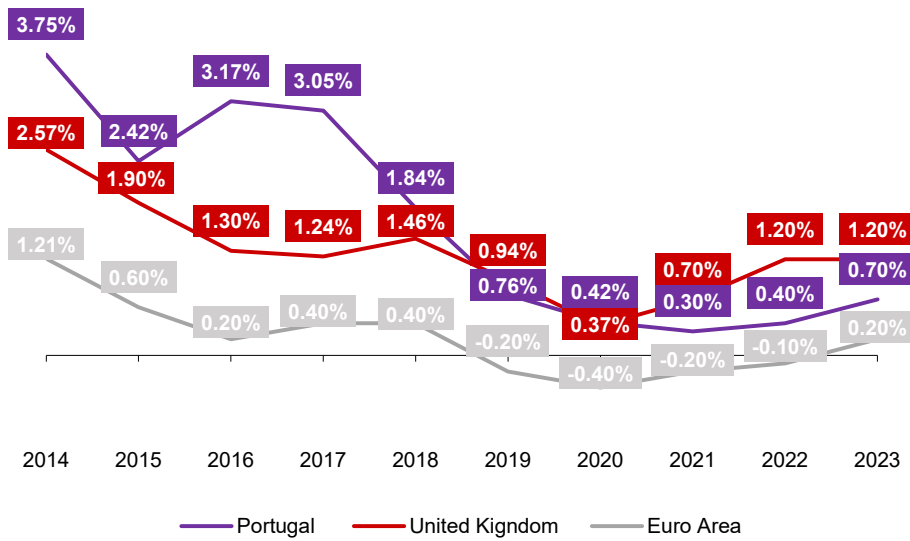
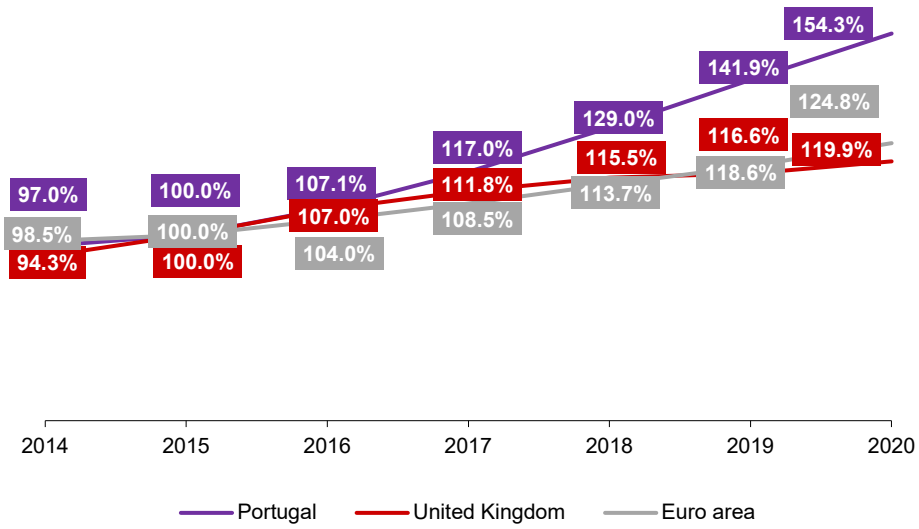


Figure 8: House prices in United Kingdom, Portugal, and Euro Area



6.2 Tables

Table XI: Inputs for WACC computation for Norfin S.A valuations

Measure of Interest	2018	2021	Source
Risk Free Rate	-0.75%	-0.72%	Eurobond AA
CDS Spread	2.89%	1.95%	Damodaram
Total Unelevered Beta	0.867	0.97	Damodaram
D/E	0.674	0.44	Damodaram
Taxes	0.21	0.21	Damodaram
Levered Beta	1.319	1.29	Estimated
Market Risk Premium	9.24%	6.85%	Damodaram
Cost of Equity	14.34%	10.07%	Estimated
Cost of Debt	3.91%	3.16%	Damodaram
WACC	11.60%	8.22%	Estimated

Table XII: Inputs for WACC computation for Arrow Global valuations

Measure of Interest	2018	2021	Source
Risk Free Rate	-0.75%	-0.72%	Eurobond AA
CDS Spread	0.46%	0.55%	Damodaram
Total Unelevered Beta	0.867	0.97	Damodaram
D/E	0.674	0.44	Damodaram
Taxes	0.19	0.19	Damodaram
Levered Beta	1.328	1.307	Estimated
Market Risk Premium	9.24%	6.25%	Damodaram
Cost of Equity	11.99%	8.01%	Estimated
Cost of Debt	5.19%	8.00%	Damodaram
WACC	8.82%	6.83%	Estimated

Table XIII: FCFF Norfin S.A 2018

Cash flow (000'€)	2018	2019	2020	2021	Perpetuity
EBITDA	2,560,386.0	4,796,342.0	2,731,850.0	2,779,480.7	2,835,070.3
Non-recurring items					
EBITDA (recurring)	2,560,386.0	4,796,342.0	2,731,850.0	2,779,480.7	2,835,070.3
Depreciation & Amortization	(709,473.6)	(827,990.6)	(829,431.6)	(837,725.9)	(854,480.5)
EBIT	1,850,912.4	3,968,351.4	1,902,418.4	1,941,754.8	4,815,660.2
Operational taxes	388,691.6	833,353.8	399,507.9	407,768.5	1,011,288.6
NOPLAT	1,462,220.8	3,134,997.6	1,502,910.5	1,533,986.3	3,804,371.5
Depreciation & Amortization (add-back)	(709,473.6)	(827,990.6)	(829,431.6)	(837,725.9)	(854,480.5)
FCF from operations	2,171,694.4	3,962,988.2	2,332,342.1	2,371,712.2	4,658,852.0
Capex	594,131.9	905,157.1	697,854.2	989,106.6	1,008,888.7
Investment in Working Capital	3,492,589.0	3,946,021.5	4,913,815.0	5,521,383.6	5,631,811.3
Variação do working capital	(586,625.6)	453,432.5	967,793.5	607,568.6	110,427.7
FCFF	990,937.0	3,511,263.7	2,602,281.4	1,990,174.2	3,760,390.9
T		1	2	3	
FCFF Discounted	990,937.0	3,146,007.3	2,089,040.3	1,431,462.3	39,129,337.8
Enterprise Value					46,786,784.7

Table XIV: FCFF 2018 Arrow Global

Cash flow (000'£)	2018	2019	2020	2021	Perpetuity
EBIT	106,783.0	105,818.0	(57,328.0)	77,460.1	79,009.3
Operational taxes	20,288.8	20,105.4	(10,892.3)	14,717.4	15,011.8
NOPLAT	86,494.2	85,712.6	(46,435.7)	62,742.7	63,997.6
Depreciation & Amortization (add-back)	14,235.0	18,435.0	18,910.0	15,871.1	16,188.5
FCF from operations	100,729.2	104,147.6	(27,525.7)	78,613.8	80,186.1
Capex	11,828.0	35,195.0	12,001.0	14,149.1	14,432.1
Investment in Working Capital	830,261.0	640,199.0	599,570.0	461,037.4	470,258.1
Variação do working capital	41,559.0	(190,062.0)		(138,532.6)	9,220.7
FCFF	130,460.2	(121,109.4)	(39,526.7)	(74,068.0)	74,974.7
T	0	1	2	3	
FCFF Discounted	130,460.2	(111,293.5)	(33,379.1)	(57,478.6)	1,099,359.7
Enterprise Value (000'£)					1,027,668.8
Enterprise Value (000'€)					1,147,083.9

Table XV: FCFF Norfin S.A 2021 Pessimistic Scenario

Cash flow (000'€)	2021	2022	2023	2024	Perpetuity
EBITDA	2,779,480.7	2,980,503.4	3,201,142.3	3,430,745.4	3,489,068.1
Non-recurring items	-	-	-	-	-
EBITDA (recurring)	-	-	-	-	-
Depreciation & Amortization	(837,725.9)	(857,831.4)	(878,419.3)	(899,501.4)	(914,792.9)
EBIT	1,941,754.8	2,122,672.0	2,322,722.9	2,531,244.0	2,574,275.2
Operational taxes	407,768.5	445,761.1	487,771.8	531,561.2	540,597.8
NOPLAT	1,533,986.3	1,676,910.9	1,834,951.1	1,999,682.8	2,033,677.4
Depreciation & Amortization (add-back)	(837,725.9)	(857,831.4)	(878,419.3)	(899,501.4)	(914,792.9)
FCF from operations	2,371,712.2	2,534,742.3	2,713,370.4	2,899,184.1	2,948,470.3
Capex	965,268.3	950,530.1	971,953.1	978,210.0	994,839.6
Investment in Working Capital	5,153,356.0	6,570,516.0	8,005,514.4	9,229,240.5	9,386,137.6
Variação do working capital	239,541.0	1,417,160.0	1,434,998.4	1,223,726.1	156,897.1
FCFF	1,645,984.9	3,001,372.1	3,176,415.7	3,144,700.3	2,110,527.8
T	0	1	2	3	
FCFF Discounted	1,645,984.9	2,771,685.5	2,708,853.7	2,476,575.6	32,041,329.2
Enterprise Value					41,644,429.0

Table XVI: FCFF Norfin S.A 2021 moderate Scenario

Cash flow (000'€)	2021	2022	2023	2024	Perpetuity
EBITDA	2,779,480.7	3,025,357.6	3,298,612.1	3,587,176.9	3,658,920.4
Non-recurring items	-	-	-	-	-
EBITDA (recurring)	-	-	-	-	-
Depreciation & Amortization	(837,725.9)	(862,857.7)	(888,743.4)	(915,405.7)	(933,713.9)
EBIT	1,941,754.8	2,162,499.9	2,409,868.6	2,671,771.1	2,725,206.6
Operational taxes	407,768.5	454,125.0	506,072.4	561,071.9	572,293.4
NOPLAT	1,533,986.3	1,708,374.9	1,903,796.2	2,110,699.2	2,152,913.2
Depreciation & Amortization (add-back)	(837,725.9)	(862,857.7)	(888,743.4)	(915,405.7)	(933,713.9)
FCF from operations	2,371,712.2	2,571,232.6	2,792,539.7	3,026,105.0	3,086,627.1
Capex	989,106.6	958,050.3	985,939.1	998,446.4	1,018,415.3
Investment in Working Capital	5,521,383.6	6,976,182.5	8,467,251.6	9,758,356.7	9,953,523.9
Variação do working capital	607,568.6	1,454,798.9	1,491,069.1	1,291,105.1	195,167.1
FCFF	1,990,174.2	3,067,981.2	3,297,669.6	3,318,763.7	2,263,378.9
T	0	1	2	3	
Free cash flow	1,990,174.2	2,833,197.2	2,812,259.3	2,613,657.4	36,001,554.9
Enterprise Value					46,250,843.1

Table XVII: FCFF Norfin S.A 2021 Optimistic scenario

Cash flow (000'€)	2021	2022	2023	2024	Perpetuity
EBITDA	2,779,480.7	3,046,974.5	3,345,922.9	3,663,709.7	3,742,479.4
Non-recurring items	-	-	-	-	-
EBITDA (recurring)	-	-	-	-	-
Depreciation & Amortization	(837,725.9)	(865,370.9)	(893,928.1)	(923,427.8)	(943,281.5)
EBIT	1,941,754.8	2,181,603.6	2,451,994.8	2,740,281.9	2,799,198.0
Operational taxes	407,768.5	458,136.8	514,918.9	575,459.2	587,831.6
NOPLAT	1,533,986.3	1,723,466.8	1,937,075.9	2,164,822.7	2,211,366.4
Depreciation & Amortization (add-back)	(837,725.9)	(865,370.9)	(893,928.1)	(923,427.8)	(943,281.5)
FCF from operations	2,371,712.2	2,588,837.7	2,831,004.0	3,088,250.5	3,154,647.9
Capex	989,106.6	961,268.3	992,711.9	1,008,906.0	1,030,597.4
Investment in Working Capital	5,521,383.6	6,987,040.3	8,502,548.8	9,831,274.4	10,042,646.8
Variação do working capital	607,568.6	1,465,656.8	1,515,508.5	1,328,725.5	211,372.4
FCFF	1,990,174.2	3,093,226.2	3,353,800.6	3,408,070.1	2,335,422.8
T	0	1	2	3	
Free cash flow	1,990,174.2	2,856,510.3	2,860,127.9	2,683,989.7	38,055,465.0
Enterprise Value					48,446,267.1

Table XVIII: FCFF Arrow Global 2021 Pessimistic Scenario

Cash flow (000'£)	2021	2022	2023	2024	Perpetuity
EBIT	77,460.1	82,724.9	88,180.1	93,944.0	95,541.0
Operational taxes	14,717.4	15,717.7	16,754.2	17,849.4	18,152.8
NOPLAT	62,742.7	67,007.2	71,425.9	76,094.6	77,388.2
Depreciation & Amortization (add-back)	15,871.1	16,379.0	16,903.1	17,444.0	17,740.5
FCF from operations	78,613.8	83,386.2	88,329.0	93,538.6	95,128.7
Capex	14,149.1	18,345.0	19,159.2	20,010.7	20,350.9
Investment in Working Capital	461,037.4	518,080.2	583,539.2	658,009.4	669,195.5
Variação do working capital	(138,532.6)	57,042.9	65,459.0	74,470.2	11,186.2
FCFF	(74,068.0)	122,084.0	134,628.8	147,998.1	85,964.1
T	0	1	2	3	
FCFF Discounted	(74,068.0)	114,340.5	118,091.9	121,584.9	1,694,752.9
Enterprise Value (000'£)					1,974,702.2
Enterprise Value (000'€)					2,347,387.8

Table XIX:FCFF Arrow Global 2021 Moderate Scenario

Cash flow (000'£)	2021	2022	2023	2024	Perpetuity
EBIT	77,460.1	84,041.1	90,953.0	98,353.2	100,320.3
Operational taxes	14,717.4	15,967.8	17,281.1	18,687.1	19,060.9
NOPLAT	62,742.7	68,073.3	73,671.9	79,666.1	81,259.4
Depreciation & Amortization (add-back)	15,871.1	16,505.9	17,166.2	17,852.8	18,209.9
FCF from operations	78,613.8	84,579.2	90,838.1	97,518.9	99,469.3
Capex	14,149.1	18,542.2	19,571.2	20,659.2	21,072.4
Investment in Working Capital	461,037.4	520,117.9	589,898.7	671,322.8	684,749.3
Variação do working capital	(138,532.6)	59,080.6	69,780.8	81,424.1	13,426.5
FCFF	(74,068.0)	125,117.6	141,047.7	158,283.8	91,823.4
T	0	1	2	3	
Free cash Flow (T=0)	(74,068.0)	117,181.7	123,722.4	130,034.9	1,924,065.1
Enterprise Value (000'£)					2,220,936.1
Enterprise Value (000'€)					2,640,093.3

Table XX: FCFF Arrow Global 2021 scenario Optimistic

Cash flow (000'£)	2021	2022	2023	2024	Perpetuity
EBIT	77,460.1	84,699.2	92,353.4	100,602.1	102,765.1
Operational taxes	14,717.4	16,092.9	17,547.1	19,114.4	19,525.4
NOPLAT	62,742.7	68,606.4	74,806.2	81,487.7	83,239.7
Depreciation & Amortization (add-back)	15,871.1	16,569.4	17,298.5	18,059.6	18,447.9
FCF from operations	78,613.8	85,175.8	92,104.7	99,547.3	101,687.6
Capex	14,149.1	18,516.2	19,954.5	21,309.7	21,767.9
Investment in Working Capital	461,037.4	514,825.1	595,686.7	696,932.9	711,916.9
Varição do working capital	(138,532.6)	53,787.7	80,861.6	101,246.2	14,984.1
FCFF	(74,068.0)	120,447.3	153,011.9	179,483.8	94,903.8
T	0	1	2	3	
FCFC Discounted	(74,068.0)	112,807.5	134,217.0	147,451.3	2,053,143.5
Entreprise Value (000'£)					2,373,551.4
Entreprise Value (000'€)					2,821,511.7

Table XXI: List of comparable companies for market multiples

Identifier (RIC)	Company Name	P/E	Price to Book Value per Share
PLD	Prologis Inc	28.21	3.052
DRE.N	Duke Realty Corp	18.568	3.064
BXP.N	Boston Properties Inc	34.066	3.195
EGP.N	Eastgroup Properties Inc	35.575	4.196
FRN	First Industrial Realty Trust Inc	27.994	3.13
EQR.N	Equity Residential	21.404	2.659
SPG.N	Simon Property Group INC	17.762	11.87
ESS.N	Essex Property Trust Inc	51.934	3.437

Table XXII: Market multiples valuation using the price to earnings for Norfin S.A. 2018.

Price to Earnings (P/E)		Multiple	P/E Value ('000 €)	Valuation
	First Quantile	20.695	1544.831	31,970,012.86 €
	Median	28.102		43,412,370.80 €
	Average	29.439		45,478,306.94 €
	Third Quantile	32.602		50,364,523.29 €

Table XXIII: Market multiples valuation using the price to book for Norfin S.A. 2018.

Price to Book Value (P/B)	Statistics	Multiple	P/B Value ('000 €)	Valuation
	First Quantile	3.061	12396.404	37,944,998.41 €
	Median	3.162		39,200,340.91 €
	Average	4.325		53,618,848.49 €
	Third Quantile	3.377		41,859,561.09 €

Table XXIV: Market multiples valuation using the price to earnings for Arrow Global 2018.

Price to Earnings (P/E)	Statistics	Multiple	P/E Value ('000 €)	Valuation
	First Quantile	20.695	33451.3978	692,270,945.97 €
	Median	28.102		940,041,004.61 €
	Average	29.439		984,776,287.31 €
	Third Quantile	32.602		1,090,581,237.50 €

Table XXV: Market multiples valuation using the price to Earnings for Norfin S.A 2021.

Price to Earnings (P/E)	Statistics	Multiple	P/E Value ('000 €)	Valuation
	First Quantile	20.695	1405.17	29,079,752.39 €
	Median	28.102		39,487,659.87 €
	Average	29.439		41,366,824.31 €
	Third Quantile	32.602		45,811,300.52 €

Table XXVI: Market multiples valuation using the price to Book for Norfin S.A 2021

Price to Book Value (P/B)	Statistics	Multiple	P/B Value ('000 €)	Valuation
	First Quantile	3.061	12255.07	37,512,394.14 €
	Median	3.162		38,753,424.70 €
	Average	4.325		53,007,549.40 €
	Third Quantile	3.377		41,382,327.57 €

TableXXVII: Market multiples valuation using the price to Earnings for Arrow Global
2021.

Price to Earnings (P/E)	Statistics	Multiple	P/E Value ('000 €)	Valuation
	First Quantile	20.695	13943.13	288,550,633.87 €
	Median	28.102		391,825,526.30 €
	Average	29.439		410,471,974.27 €
	Third Quantile	32.602		454,573,327.39 €

Table XXVIII:: Market multiples valuation using the price to Book for Arrow Global
2021

Price to Book Value (P/B)	Statistics	Multiple	P/B Value ('000 €)	Valuation
	First Quantile	3.061	155181.21	475,004,749.78 €
	Median	3.162		490,719,433.57 €
	Average	4.325		671,213,829.94 €
	Third Quantile	3.377		524,008,200.65 €