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The Potential of Unicorns: Feedzai S.A.'s case

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Master in Finance

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PhD Paulo Viegas de Carvalho, Assistant Professor,
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BUSINESS
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Concluído aquele que deverá ser o fecho da minha vida académica, gostaria de expressar a minha gratidão às pessoas que tornaram esta jornada possível.

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Resumo

O principal objetivo deste trabalho final de mestrado é compreender como viver nesta nova era dos unicórnios, empresas que atingem uma avaliação de mil milhões de dólares. Este fenômeno das empresas unicórnio continua em ascensão e, o que antes era uma raridade, hoje conta com mais de mil empresas com esse estatuto. O foco recai sobre as empresas relacionadas aos serviços financeiros, também conhecidas como fintechs. Será que elas justificam os investimentos que receberam ou estão simplesmente sobrevalorizadas? Este é um ponto a descobrir enquanto exploro como conduzir a sua avaliação financeira.

Para uma compreensão mais aprofundada, é realizado um estudo para estimar o justo valor de uma fintech unicórnio. A fintech escolhida é a única unicórnio totalmente portuguesa, a Feedzai S.A., líder de mercado na prestação de serviços para combater a criminalidade financeira com Inteligência Artificial.

Este projeto proporciona perceções práticas a investidores, startups e decisores políticos que operem no dinâmico ecossistema das fintech. As conclusões destacam o equilíbrio necessário entre o crescimento acelerado e a criação sustentável de valor, oferecendo orientações sobre como avaliar uma empresa unicórnio a quem pretenda navegar pelo mundo das empresas unicórnios.

Classificação JEL: G24, G30

Palavras-chave: Unicórnio, Fintech, Avaliação de Empresas

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Abstract

The main purpose of this master project is to enter and learn how to live in the new era of unicorns, which are companies that reach the 1$ billion-dollar valuation. These companies' phenomena keep on rising and what once was a rarity, today counts more than one thousand companies with this status. The focus is on the companies related to financial services, also known as fintech companies. Are they worth the investments they have received or are they just overvalued? That is something to find out while discovering how valuations are taken.

For a better understanding, a case study estimating a unicorn fintech's fair value is performed. The chosen fintech is the only fully Portuguese unicorn, Feedzai S.A.'s, market leader in providing services to fight financial crime with Artificial Intelligence.

This research offers practical insights for investors, startups, and policymakers navigating the dynamic fintech ecosystem. The findings outline the delicate balance that is needed between rapid growth and sustainable value creation, providing guidance on how to value a unicorn company for stakeholders seeking to navigate this world of unicorn companies.

JEL Classification: G24, G30
Keywords: Unicorn, Fintech, Company Valuation

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Glossary

AI – Artificial Intelligence

CAPEX – Capital Expenditures

CAPM – Capital Asset Pricing Model

CEO – Chief Executive Officer

CRP – Country Risk Premium

D&A – Depreciation and Amortization

DCF – Discounted Cash-Flow

D/E ratio – Debt-to-Equity Ratio

E – Equity

EBIT – Earnings before Interest and Taxes

EBITDA – Earnings before Interest, Taxes, Depreciation and Amortization

EV – Enterprise Value

FCF – Free Cash Flow

FCFE – Free Cash Flow to Equity

FCFF – Free Cash Flow to the Firm

FDI - Foreign Direct Investment

IPO – Initial Public Offering

ML – Machine Learning

MRP – Market Risk Premium

NOPLAT – Net Operating Profit Less Adjusted Taxes

PIPO – Private Initial Public Offering

PRR - Recovery and Resilience Plan

ROIC – Return on Invested Capital

SME – Small and Medium-sized Enterprises

USA – United States of America

USD – United States Dollar

WACC – Weighted Average Cost of Capital

WC – Working Capital

Introduction

Imagine a world where mythical creatures and business ventures converge. The term unicorn conjures images of an ethereal, white creature with a single horn, but in today's lexicon, it also represents a groundbreaking concept in the business realm. While the first meaning of unicorn in the Cambridge Dictionary refers to the fantastical animal, a newer definition has emerged: unicorn signifies a start-up—often a new business—whose valuation surpasses $1 billion. This transition in linguistic usage reflects a broader shift in the business landscape, where high-valued start-ups are capturing attention like never before.

This linguistic evolution, from mythical creature to business marvel, gained prominence, as Lee (2013) in TechCrunch associated the term with the remarkable achievement of crossing the elusive $1 billion threshold—a remarkable rarity for companies in those times. The evolution is staggering, and this shift is a testament to the rapid pace of technological advancement and the deep pockets of venture capitalist investors, enabling companies to reach new valuation heights.

This master project embarks on a journey that traverses the history of unicorns, their rise as business icons, and their valuation complexities. Delving into the narrative of Feedzai, the sole Portuguese unicorn, this study seeks to unveil its true worth by analysing the latest financial data. As we navigate this intriguing world, insights into the characteristics that propel companies to unicorn status will be shared as well as the advantages and concerns associated with the unique dynamics of this emergent business landscape.

The valuation aspect is of vital importance. In particular, assessing the worth of unicorns poses a significant challenge. This is due to the prevailing perception in the market that these companies might be valued higher than their actual worth. Additionally, venture capitalists may sometimes overestimate their potential. Feedzai, while a unicorn, finds itself beyond the initial startup phase—positioned within the high-growth phase. This is a phase of tremendous strides in client acquisition, market presence, and revenue expansion, despite lingering periods of financial losses. However, the core of the company's value predominantly resides in projected future growth, rendering valuation a complex effort, especially in the earlier life cycle stages. This research accepts the challenge, applying the valuation methodologies of Damodaran (2012) and more to guide the assessment. Furthermore, a key element of this study is to understand whether the rapid growth experienced by companies like Feedzai effectively translates into increased overall value.

This project will adopt a five-section structure. The initial section contains a Literature Review with a depiction of unicorns, accompanied by explanations of valuation methodologies. Moving forward, section two delves into a comprehensive scrutiny of Feedzai S.A. and its operational undertakings, while an extensive analysis of the global sector's panorama will be undertaken in the subsequent

section, namely section three. Lastly, the fourth section will unveil an exhaustive assessment of the company's value, as extrapolated from the Discounted Cash Flow approach (FCFF). In the closing section, the main conclusions will be presented, and a final recommendation will be performed regarding the Portuguese unicorn value compared to its current valuation made up of the investments they have received.

1. Literature Review

The goal of this section is to provide insights regarding start-ups, unicorns, and fintech companies as well as to find the best approach to perform the valuation of a company. Given the high number of academically accepted models for estimating a company's fair value, many of which are validated by academics, many approaches nowadays rely upon a mix of models.

This section is divided into the history of unicorns and the valuation of a unicorn.

1. The History of Unicorns

The finance world is mostly a collection of quantitative data, but a touch of qualitative research is needed to understand the new topics brought to the table. I decided to use qualitative content analysis to understand how the market interprets the hot topic of unicorns. This type of research focuses on the contextual meaning of the text and allows the researcher to immerse in the data to allow new insights to emerge (Kondracki et al., 2002).

It was on the 2nd of November 2013 that the terminology "unicorn" first appeared in economic matters. At that time, to be a part of the "Unicorn Club" companies had to be United States of America (USA) based tech companies valued at $1 billion by private or public markets (Lee, 2013). However, the definition has been adjusted and is broader nowadays.

During the last decade, unicorns have begun to appear at a quick pace and are not so rare anymore. Today its definition consists in companies that have always been private, have received at least one funding round of institutional capital, are not a divisional buyout of a public company, and have an estimated market value of one billion United States dollars (USD) or more (Brown & Wiles, 2015). According to certain studies, the likelihood of a company becoming a unicorn can be influenced by several factors. For instance, if a company is founded in the Silicon Valley area, there is, on average, a 14.7% probability of achieving unicorn status. Additionally, the type of investors a company attracts, such as corporate venture capitalists, can play a crucial role. Their strategic support and guidance, in addition to financial backing, are often key differentiating factors. Lastly, a company's growth strategy, particularly one characterized by aggressive and inorganic expansion through add-on acquisitions, can also favour its overall success (Bock & Hackober, 2020).

For a company to become a unicorn some significant factors must align. Certain associated factors help to speed up the unicorn status and, looking deeply into the unicorn's lists, it is shown that over 80% of founders/Chief Executive Officer (CEO) were not part of Ivy League institutions or elite universities and almost half of the founders earned a technology or engineering degree. A curious factor is that about 62% of ventures lacked prior experience at the time of the founding. Moving on to

the external factors, it was proven that the more funding per investment the less time was required to achieve unicorn status (Kotha et al., 2022).

Status is something that is desired, which makes people want to achieve it, and the status of being a unicorn is no exemption. According to multiple references, founders and early-stage investors in private enterprises feel the urge to push up their companies for them to achieve this status for the potential publicity, marketing, and recruiting benefits and that will make investors from later funding rounds receive higher preference payments or favourable warrant coverage terms (Bock & Hackober, 2020; Brown & Wiles, 2020). That means that most companies are overvalued and that the price is nothing but the amount that the investors are willing to pay. There is no correct valuation of a company, it is always based on proxies and multiples that represent what they foresee for the future based, more likely, on sales multiples (Pimentel, 2021). Though, it is a fact that technology startup companies have a higher value-added, attracting more attention from investors, and having higher growth possibilities due to the potential investors believe they have (Bertoni et al., 2011).

This continuous growth of unicorns is only possible thanks to the private funding rounds that offer these companies the alternative to the traditional path which is getting capital in the public market through an Initial Public Offering (IPO). What we see nowadays is companies becoming unicorns through "private IPOs", also known as PIPOs, as it gives them the capital they need without the control of public equity investors. Nevertheless, IPOs make it possible for startups to fund expansions, use investments for balancing accounts or invest in further growth. Also, what is now happening is that companies take at least more than ten years to have an IPO whereas initially, without private capital funding, the typical time would be three to five years (Brown & Wiles, 2020). By this point, it is an acknowledge that the status of unicorn is not a synonym of enough stability as technology startups generate losses for several years until activity finally reaches profitability and the investors need to be taken into a good exit either by an IPO, a private merger or acquisition, or a dissolution that hopefully allows their investors a return of their investments. The most common way investors may exit this is the IPO, as it is considered the best option for investors to receive returns on investments (Bock & Hackober, 2020). Although this is not ideal for venture capitalists, it is commonly the only possible way of exiting for big unicorns as they are too valued to continue with PIPOs even if, on average, unicorns are mostly unprofitable and have highly negative returns (Kartanaite & Krusinskas, 2022; Pimentel, 2021).

Financial technologies companies, also known as fintech, are taking over the financial world with their low maintenance costs related to financial services. Their bloom was right after the financial crisis of 2008 as they differentiated themselves from traditional financial companies with their disruptive innovation of unique, niche, and personalized services. For the fintech ecosystem, five elements that contribute to the innovation and stimulation of the economy were identified: fintech startups,

technology developers, government, financial customers, and traditional financial institutions (I. Lee & Shin, 2017; Morales et al., 2022).

A concrete example of the fintech revolution is the case of banks. The banking industry is one of the most affected sectors of this technology revolution (Cruz-García et al., 2021; Fung et al., 2020; Zhao et al., 2022). After the 1980s, a substantial reduction in transaction costs and information asymmetries have been noticed because of technology and shifting business demands (Murinde et al., 2022). Although, a few authors take back the "revolution" saying that it is, instead, an evolution of a long-existing relationship between finance and technology (Morales et al., 2022).

Something that has paired in the air is the tech bubble of the overvalued companies. Is the bubble about to pop? According to Cristina Fonseca, co-founder of the unicorn Talkdesk, Co-founder and Venture Partner of Indico Capital Partners, and Non-Executive Board Member of GALP, we are inevitably in a tech bubble and that is due to a lot of money available in the market (Pimentel, 2021). The Economist's (2019) study concluded that for companies to justify their valuations made by private investors they will need to increase their sales by a compound annual rate of 49% for ten years while other studies state that unicorns are overvalued in a mean of 60% (Lynch, 2017). Also, confirming this premise, it is known that 84% of IPO-seeking startups are unprofitable (Gao et al., 2013).

As seen so far, a company that is a unicorn is usually a company with high growth and no profits. Higgins (1977) has already studied the relationship between growth and the profitability of a firm and one of his points is the fact that many companies make the mistake of pursuing growth without considering the financial implications of it. For instance, Koller et al. (2020) state that when a company earns a return on invested capital (ROIC) that is higher than its opportunity cost of capital, it generates value. On the other hand, if the ROIC is equal to or lower than the cost of capital, growth may not add value, achieving an optimal balance between growth and return on invested capital is crucial for creating value. However, sustaining high growth is much more difficult than sustaining ROIC, especially for larger companies.

Higgins's (1977) report demonstrates that a company can sustain high growth rates only if it generates sufficient internal funds to finance its investments. If a company relies too strongly on external financing, it may become over-leveraged and unable to cover its debt. Thus, the key to sustainable growth is to maintain a balance between growth and profitability and good financial planning to understand the right needs and resources of the company when it comes to making moves about growth.

To calculate a firm's sustainable growth the additional assets should require financing via fresh debt and an augmentation in equity through retained earnings:

$$g^* = \frac{\Delta s}{s} = \frac{\frac{NI}{S}(1-d)(1+\frac{D}{E})}{\frac{A}{S} - \frac{NI}{S}(1-d)(1+\frac{D}{E})} \quad (1)$$

where, s = sales at the beginning of the year, Δs = increase in sales during the year, $\frac{NI}{S} = \frac{Net\ Income}{Sales}$ is the profit margin on new and existing sales after taxes, d = the target dividend payout ratio, and (1 - d) therefore is the target retention ratio, $\frac{D}{E}$ = the target total debt-to-equity ratio, $\frac{A}{S}$ = the ratio of total assets to net sales on new and existing sales.

If the actual growth sales, g, exceeds g^* Higgins (1977) suggests the following three choices: 1) raise new equity; 2) adjust the profit margin on new and existing sales after taxes, the target dividend payout ratio, the ratio of total assets to net sales on new and existing sales and the target total debt to equity ratio until g and g^* are equals; 3) reduce g.

Maintaining growth can be a challenging task according to Koller et al. (2020) as most product markets exhibit natural life cycles and, in the end, the growth and size of a company are limited by the growth and size of the product markets it serves and the number of markets it competes in. Notwithstanding, certain industries have maintained a consistent pattern of being among the fastest growing over extended periods and these include technology sectors, such as information services and software and technology hardware which have experienced sustained demand over the past 30 years and beyond, explaining the unicorn's exponential growth.

2. Valuation of a unicorn

For economics, value is the measurement of the benefit that derives from a good or service to an individual or company. The principle of value creation consists in companies creating value by investing capital they raise from investors to generate future cash flows at rates of return exceeding the cost of capital (Koller et al., 2010).

A lot of companies use a mix of approaches to estimate value and though analysts estimate value in many ways, the past years have seen a clear trend toward more formal methods, which have a theory and a model, more explicit and institutionalized. In the '70s, discounted cash-flow analysis (DCF) emerged as the prevailing method for valuating corporate assets, with a specific version of it becoming the established norm. This method posits that the value of a business is equivalent to its anticipated future cash flows, which are then discounted to their present value using the weighted-average cost of capital (WACC) (Luehrman, 1997). Nevertheless, to do a solid and reliable valuation it is crucial to have into consideration obtaining as updated an estimate as possible given the fact that companies are constantly changing over time, and to bear in mind that reported earnings may very little resemble

true earnings because of limitations in accounting rules and firm's deliberate actions (Damodaran, 2012).

As limitations have been mentioned, there are companies where the valuation exercise may have some limitations and where it becomes more difficult to estimate values. Companies with negative earnings are one of those cases, as many models depend on earnings growth to make future projections. The reason companies have negative or abnormally low earnings can be viewed as temporary, either long-term, or related to the company's life cycle.

As Damodaran (2012) referred to, the problem in valuations is not the fact that there are not enough models but that there are too many, and deciding on the model to use in valuation is as critical to arriving at a reasonable value as the understanding of how to use the model.

In this project, different methodologies to perform a valuation will be presented to choose the best methods and how to mix them for a better valuation.

2.1. Discounted Cash Flow Valuation

Looking in detail into the DCF Valuation, to Damodaran (2012) this method has its pillars in the present value rule, where the value of any asset is the present value of expected future cash flows on it:

$$Value = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t} \tag{2}$$

where n = lifetime of the asset, CF_t = cash flow in period t and r = discount rate reflecting the riskiness of the estimated cash flows.

For the valuation of a business within this method, two paths can be followed: The Free Cash Flow to the Firm (FCFF) and The Free Cashflow to Equity (FCFE).

Pinto et al. (2010) explain that FCFF, or free cash flow to the firm, is the amount of cash flow that a company's suppliers of capital can access after all operating expenses (including taxes) have been settled and necessary investments in working capital (such as inventory) and fixed capital (such as equipment) have been made. In simpler terms, FCFF is calculated as the cash flow from operations minus capital expenditures (CAPEX). It is worth noting that the company's suppliers of capital include common stockholders, bondholders, and occasionally preferred stockholders. It is important to mention that the equations analysts use to compute FCFF may vary based on the available accounting information.

$$FCFF = EBIT\,(1-t) + Depreciation - Capital\ expenditure \\ - \Delta\, Working\ capital\ needs \tag{3}$$

where, $EBIT = operating\ income$, $t = Effective\ Tax\ rate = \frac{Income\ Taxes}{EBIT}$, $Capital\ expenditure$ the reinvestment in new assets, $Working\ capital\ needs$ are the needs to maintain the company as a going concern.

Furthermore, the value of the firm is also obtained by discounting the present value of the future FCFF discounted at the WACC, as follows:

$$Value\ of\ firm = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1+WACC)^t} \quad (4)$$

where $FCFF_t$ = free cash flow to the firm in year t and $WACC$ = weighted average cost of capital. The latter is determined based on the cost of funding, both debt and equity:

$$WACC = r_E \times \frac{E}{D+E} + r_D \times \frac{D}{D+E} \times (1-t) \quad (5)$$

where E = market value of equity, D = Market value of debt (net of cash), t = marginal corporate tax rate, r_E = equity cost of capital and r_D = debt cost of capital.

In line with Koller et al. (2020), it is important to note that free cash flow measurements do not inherently account for interest tax shields. Therefore, for a more accurate incorporation of the interest tax shield into the WACC, it is advisable to utilize the after-tax cost of debt. This adjustment holds significance in ensuring a precise assessment of a company's actual cost of capital, considering the tax advantages associated with debt financing.

When computing free cash flow under the assumption that the company is financed by a mix of equity and debt, it allows for uniform comparisons across different companies and time periods, irrespective of their capital structures. However, it is crucial to acknowledge the intrinsic value of the tax shield in this context as well. In an enterprise valuation employing the WACC, the tax shield is integrated into the cost of capital. To accurately evaluate the tax shield's worth, the cost of debt is adjusted by the marginal tax rate:

$$After-tax\ cost\ of\ debt = r_D * (1-t) \quad (6)$$

As for Luehrman (1997), the WACC-based criterion is outdated today, but that does not imply it is no longer effective. In fact, with the advanced computers and data available today, it is likely that it performs better than ever. Berk & DeMarzo (2017) claimed the use of the WACC method is very uncomplicated and straightforward. However, it is valuable when the firm maintains a constant debt-equity ratio and when it, consequently, remains constant over time.

Reversing the process used to get to the free cash flow to the firm, we obtain:

$$FCFE = FCFF - Interest * (1-t) + \Delta\ Net\ Debt \quad (7)$$

The FCFE valuation approach estimates the value of equity in the business by discounting free cash flows to equity at the cost of equity:

$$Value\ of\ equity = \sum_{t=1}^{t=\infty} \frac{\mathrm{FCFE}_t}{(1+r)^t} \quad (8)$$

where $FCFE_t$ = free cash flow to equity in year t and r = rate of return on equity.

Up until now, the discussion regarding FCFF and FCFE has assumed that the organization has a straightforward capital structure consisting of only two forms of financing: debt and equity. According to Pinto et al. (2010), the distribution of cash dividends to common stockholders does not impact FCFF or FCFE, which represents the amounts of cash accessible to all investors through the utilization of the available cash. However, modifying the leverage does have some ramifications over FCFE, while an increase in leverage will not affect FCFF.

When conducting a DCF valuation, it is not practical to project cash flows indefinitely into the future. To address this, a terminal value is typically computed to represent the firm's value at a specific point in time, thereby establishing a finite endpoint for cash flow estimation. Damodaran (2012) presented three ways: (1) Liquidation Value, (2) Multiple Approach, and (3) Stable Growth Model. The first method is based on the book value of the assets adjusted for any inflation during the period or by estimating the value based on the earning power of the assets.

The second method, known as the multiples approach, estimates the value of a firm in a future year by applying a specific factor (multiple) to the firm's earnings or revenues for that year. However, if the multiple is calculated by looking at comparable firms in the business today the valuation becomes a relative valuation.

Lastly, the third method, the stable growth model, can be employed by setting a defined period, typically ranging from 5 to 10 years. At the end of this period, the company evaluated is assumed to reach a steady state and maintain a constant growth rate in perpetuity, which enables the estimation of all future cash flows as a terminal value. The terminal value for the stable growth model is:

$$Terminal\ value_t = \frac{Cash\ flow_{t+1}}{r-g} \quad (9)$$

where g = stable growth rate.

The determination of the discount rate and perpetual growth rate in the formula is based on currently available data. It is important to acknowledge the practical limitations of a company sustaining an excessively high growth rate indefinitely. This notion is explored by Damodaran (2012) who highlights that no company can realistically maintain a growth rate higher than that of the economy it operates within, the perpetual growth rate cannot surpass the overall economic growth rate. Furthermore, it is crucial to underscore that a considerable proportion of the company's valuation relies on the Terminal Value. Thus, ensuring an accurate establishment of the growth rate becomes pivotal for precisely assessing the company's value.

Finally, the value of the firm at that point of stopping the estimation of cash flows is:

$$Value\ of\ the\ firm = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r_c)^n} + \frac{Terminal\ value_n}{(1+r_c)^n} \quad (10)$$

The discount factor (r_c) serves as the rate for converting future cash flows into their present value. In contrast, the WACC represents a company's capital cost, denoting the investor's expected return for investing in the company. The WACC can be considered as the discount rate due to its role in computing the present value of a company's forthcoming cash flows. A heightened WACC results in a correspondingly elevated discount factor, leading to a reduction in the present value of the anticipated future cash flows.

The value of the firm is also known as the enterprise value of the company when including its debt and cash too. The Enterprise Value corresponds to the present value of all the cash flows generated by the company in the future.

2.1.1. Discount Rates

The valuation of a privately held firm is determined by computing the present value of anticipated cash flows, which are then discounted back using a suitable discount rate. Although this approach is analogous to the one used for valuing publicly traded firms, variations between private and public firms become evident in how the inputs for the discounted cash flow model are estimated.

2.1.1.1. Cost of Equity

In assessing the cost of equity, the absence of past price information and the failure on the part of many private firm owners to diversify can arise difficulties to estimate the betas of private companies as, typically, historical stock prices are utilized to determine the beta for the Capital Asset Pricing Model (CAPM) and the betas in multifactor models that assess the risk added to a diversified portfolio, or market risk. CAPM is highlighted as the best model for Koller et al. (2010) to estimate a company's risk adjustment factor:

$$CAPM: r_e = r_f + \beta(r_M - r_f) \quad (11)$$

where r_e = expected return of security e, r_f = risk-free rate, β = stock's sensitivity to the market and r_M = expected return of the market.

Risk-free Rate

The risk-free rate serves as the foundational element for all models estimating expected returns. For an asset to qualify as risk-free, it must satisfy two prerequisites: there should be an absence of default risk linked to its cash flows, and it must not carry reinvestment risk. Applying these benchmarks, in the domain of corporate finance and valuation, we are directed toward utilizing long-term government bond rates as proxies for risk-free rates (Damodaran, 2012). Especially within European scenarios, the predominant strategy tends to gravitate towards the adoption of the 10-year German Eurobond. This selection is underpinned by its status as an AAA-rated nation, positioning it as an exemplar within the realm of investment grade classifications.

Country Risk Premium

The standard practice in valuation entails incorporating a country risk premium (CRP) into a company's assessment, contingent on its country of incorporation. This premium accounts for the heightened risk associated with operating within a specific nation's economic and political landscape. When considering the cost of equity, the CRP represents the supplementary compensation that investors demand due to the increased risk exposure linked to a particular country. In the computation of the cost of equity using CAPM, the CRP is integrated with the risk-free rate. The prevailing approach to calculate this parameter commonly involves subtracting the yield of the 10-year government bond from an AAA-rated country from the yield of the 10-year government bond of the country where the company operates.

Market Risk Premium

The market risk premium embodies the incremental return an investor stands to gain, or foresees gaining, from maintaining a portfolio reflective of the market's volatility as opposed to opting for risk-free assets. To determine the global market risk premium, it is prudent to ground it in a comprehensive global index encompassing a substantial array of the world's investment assets. The estimation of the risk premium entails assessing the historical average excess return of the market over the risk-free interest rate, according to Berk & DeMarzo (2017). This calculation considers the dynamic interplay of market forces, investor expectations, and economic conditions that collectively shape the premium investors associate with embracing market risk. The calculation of the MRP corresponds to:

$$MRP = E[R_{Mkt}] - rf \quad (12)$$

Beta

In the context of valuing a private firm, understanding the risk profile is crucial for investors and analysts. Determining the company's beta, which measures its sensitivity to market movements, can be challenging due to the limited availability of publicly accessible data. Various approaches exist to

estimate market betas for private companies, such as accounting betas, fundamental betas, and bottom-up betas.

On another hand, to overcome the challenge of limited information, analysts often rely on the relationship between levered and unlevered betas, also known as the unlevering and relevering method (Fernández, 2003), as it is a way to calculate the beta of a company by adjusting for its capital structure. The unlevered beta reflects the risk associated with the firm's core business operations, excluding the influence of debt. On the other hand, the levered beta incorporates the impact of financial leverage, considering the company's capital structure and debt obligations. For private firms, the levered beta can be calculated using the betas of the comparable publicly traded companies, calculating an average beta for these companies. The next step is to unlever the average beta of the public companies using the following equation:

$$\beta_{unlevered} = \frac{\beta_{levered}}{(1 + (1 - t)\left(\frac{Debt}{Equity}\right))} \quad (13)$$

The next step is to relever the unlevered beta using the private firm's D/E ratio to account for the fact that the private firm's capital structure is different from the capital structure of the public companies used to calculate the unlevered beta.

$$\beta_{private\ firm} = \beta_{unlevered}[1 + (1 - t)(Debt/\ Equity)] \quad (14)$$

By adjusting the unlevered beta based on the company's financial leverage, analysts can estimate the beta of the private firm. This estimation provides valuable insights into the firm's risk profile, facilitates comparisons with publicly traded firms in the same industry, and assists investors in making informed decisions and accurately valuing the equity of the private firm.

At last, the calculation of the fundamental beta consists in the following regression (Damodaran, 2012):

$$\beta = 0.93 - 0.04\ ROE + 0.167\frac{FA}{TA} + 0.17\ DC + 0.74g - 0.31t \quad (15)$$

where ROE = Return on equity, $\frac{FA}{TA} = \frac{Fixed\ Assets}{Total\ Assets}$, $DC = \frac{BV\ of\ debt}{BV\ of\ debt + BV\ of\ equity}$, g = Expected annual growth rate in net income over the next five years, and t = marginal tax rate.

Cost of Debt

From cost of equity to cost of capital two additional inputs are needed: the cost of debt and the debt ratio. The cost of debt signifies the interest rate at which a company can secure funds through borrowing. Given that interest expenses offer tax advantages, it is customary to consider the after-tax cost of debt as mentioned in equation (6).

Considering that the private firm borrowed money recently, the interest rate on the borrowing can be used as the cost of debt. However, it can also be assumed that the cost of debt for the private firm is likely to converge toward the industry average cost of debt (Damodaran, 2012).

Debt Ratio

The debt ratio denotes the percentage of a company's market value that is derived from financing via debt. Damodaran (2012) suggests that the industry average or target debt ratios can be used in this computation. However, he advises, for consistency matters, to use the same debt ratio for the cost of capital.

Concerning the D/E ratio of the public companies, needed to calculate the beta of private companies, the market value of equity can be obtained by multiplying the number of shares outstanding from the latest annual report by the stock price on the same date for each comparable company, respectively. As for debt it is determined by summing short term and long-term debt.

2.1.2. Growth

The growth rate of a private firm can be estimated by analysing either its historical growth or its fundamentals, such as the reinvestment rate and return on capital. Damodaran (2012) warns analysts to be extremely cautious when estimating private firms' growth as the valuation of a business is intrinsically tied to its anticipated earnings growth rate in the future. As a result, all forthcoming cash flows generated by the company will hinge upon the accuracy of this growth projection.

In accordance with Damodaran (2012), growth estimation can be approached in three ways: historical growth rates, analyst predictions, and an analysis of the fundamental factors influencing growth. Relying on historical growth rates may seem like the most straightforward method for forecasting future growth, although this approach may be suitable for valuing stable companies, it presents certain risks and limitations when valuing high-growth enterprises. Nevertheless, it still provides valuable insights when projecting future performance, and many analysts consider it a significant factor in their estimations.

To conclude, even though a scenario based DCF valuation approach may seem outdated, according to Koller et al. (2020) it can still be effective in situations where other methods fall short. This is because the fundamental principles of economics and finance remain applicable even in unexplored territories, as happens in the valuation of high-growth firms.

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3. Company Overview

3.1. History

Feedzai is a data science and machine learning (ML) company that uses artificial intelligence (AI) technology to quickly analyse large volumes of data from diverse sources to detect fraudulent transactions, money laundering, and other types of financial crime under one platform. Its mission is to help financial institutions prevent, detect, and remediate fraud risk and with that make banking and e-commerce safe. Founded by Nuno Sebastião, Pedro Bizarro, and Paulo Marques, in 2011, Feedzai has been named as Best-in-Class in Fraud & Anti-Money Laundering Platforms by Aite Group and one of the most promising AI companies by Forbes (D'Onfro, 2019), having CitiBank and Lloyds Banking Group as two of its major costumers.

Feedzai is headquartered in Coimbra and has offices all around the world, namely Atlanta, Hong Kong, Lisbon, London, Madrid, New York, Porto, San Mateo, and Sydney, and has more than six hundred employees supporting 190 countries.

Opening a company in Portugal during the year 2011, briefly after the 2008 financial crisis and the subsequent Troika period that lasted until 2014, presented certainly additional difficulties and unique challenges. Despite the economic instability, high unemployment rates, and stringent austerity measures imposed by the international bailout program, Feedzai has demonstrated resilience and success despite these circumstances, securing significant funding throughout its journey. Despite that economic uncertainty making it challenging for entrepreneurs to secure funding, the company was able to ensure a seed round of funding, the pre-launch stage of the business that proves the viability of the concept (Bender & Ward, 2009), of €2.4M with Armilar Venture Partners, EDP Ventures, and Novabase Capital as the first investors. Since then, the company has attracted additional seven rounds of funding from a range of investors, including Oak HC/FT, Capital One Ventures, Omega Venture Partners, Conexo Ventures, and others.

These investments, illustrated in Table 1, have enabled Feedzai to drive innovation, expand its operations, and establish itself as a prominent player in the market. And approximately three years ago, in March 2021, the company announced a $200M Series D investment round led by the leading global investment firm KKR, along with Sapphire Ventures and Citi Ventures, valuing Feedzai at $1.3 billion, achieving the so-wanted unicorn status, joining the prestigious group of startups valued at over $1 billion. This achievement was not the first for companies with Portuguese entrepreneurs nevertheless it was the first company established in Portugal to achieve this status, contributing to the country's economic growth, job creation and elevating the country's reputation as a hub for technological innovation and entrepreneurship.

Table 1: *Feedzai's Valuation & Funding*
Source: Crunchbase (2023); Pitchbook (2023).

#	Deal Type	Date	Investors	Amount	Raised to Date	Pre-Val	Post-Val
1	Early-Stage VC	23/05/2011	EDP Starter, Novabase Capital, Armilar Venture Partners	$4.5M	$4.5M		
2	Early-Stage VC (Series A)	19/02/2013	Sapphire Ventures, DCVC (Data Collective)	$2.4M	$6.9M		
3	Early-Stage VC	01/05/2014	Sapphire Ventures	$4.16M	$11.06M		
4	Early-Stage VC (Series B)	18/05/2015	Sapphire Ventures, Oak HC/FT, Capital One Ventures, Armilar Venture Partners	$17.5M	$28.56M		
5	Later Stage VC	19/10/2016	Citi Ventures	$10.54M	$39.10M		
6	Later Stage VC (Series C)	17/10/2017	Sapphire Ventures, Omega Venture Partners, Capital One Ventures	$50M	$89.10M		
7	Later Stage VC (Series D)	11/10/2021	KKR, Sapphire Ventures, Citi Ventures	$200M	$289.10M	$1.3B	$1.5B

In the initial stages of its business, Feedzai targeted sectors beyond financial institutions, including utilities, telecoms, and the health industry. Interestingly, even at that early stage, Feedzai recognized the potential of AI as a transformative force across various industries. This forward-thinking approach led them to incorporate AI into their solution, anticipating its future relevance and efficacy in combating financial crime. By leveraging AI alongside its innovative offerings, Feedzai effectively positioned itself at the forefront of the industry, demonstrating its commitment to staying ahead of the curve and harnessing the power of AI to address complex challenges. The company utilizes a variety of AI branches to power its risk management solutions. These branches include machine learning, deep

learning, and behavioural analytics. The ML models employed by Feedzai evaluate the risk associated with each transaction, classifying them accordingly, as illustrated in Figure 1. Transactions identified as elevated risk are subsequently directed to the case management User Interface for further examination by fraud analysts. During the process of approving or rejecting suspicious transactions, fraud analysts are required to provide a rationale or justification for their decision-making.

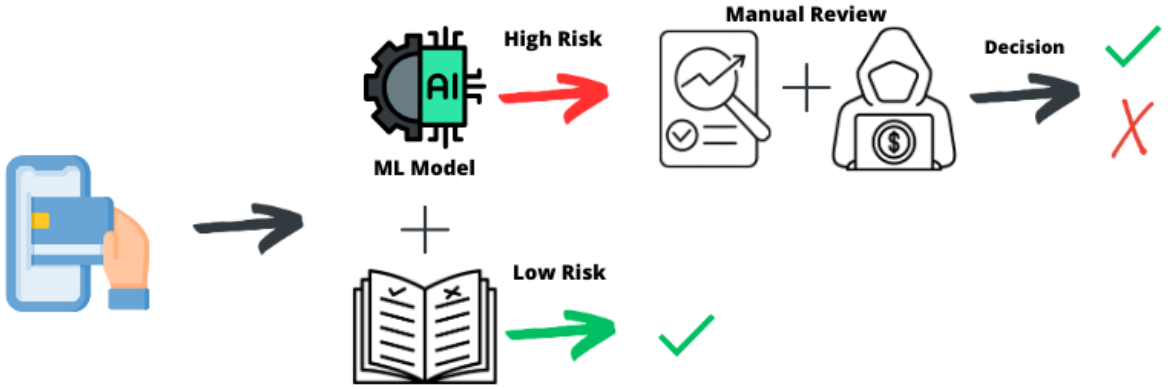

***Figure 1**: Case management flow of payment transactions through Feedzai's platform*
Source: Balayan (2020).

Ten years after its establishment, Feedzai made a significant acquisition by acquiring Revelock, a cutting-edge behavioural biometric platform. This strategic move demonstrates Feedzai's commitment to revolutionizing the financial services sector by empowering its customers to transition from mere fraud detection to initiative-taking prevention measures. By integrating Revelock's advanced technology into its offerings, Feedzai aims to reshape the industry and enhance the ability of financial institutions to safeguard against fraudulent activities (Sebastião, 2021). Furthermore, in 2021, the company unveiled the pioneering RiskOps Platform, a groundbreaking solution that goes beyond addressing financial crimes. This comprehensive platform not only equips organizations with powerful capabilities to combat financial fraud and money laundering but also incorporates tools to ensure regulatory compliance and adherence to various revenue, operational, and compliance policies. By offering a unified platform, RiskOps empowers businesses to tackle multiple challenges related to risk management, enabling them to proactively mitigate threats and streamline their overall operational processes (Carvalho, 2021).

In Portugal, records have been broken for patent applications with Feedzai at the top of the podium demonstrating they are continuously investing in innovation, development of new products, and intellectual property. These patents not only protect the company's intellectual property but also provide a significant competitive advantage by establishing barriers to entry for potential competitors. By showcasing its unique and patented technologies, Feedzai differentiates itself in the market and solidifies its position as a trailblazer in the field of AI-driven fraud detection and prevention for the

financial services industry. Overall, Feedzai's extensive patent portfolio underscores its commitment to innovation, establishes its market leadership, and reinforces its standing as a trusted provider of revolutionary solutions that address the critical challenges of fraud detection and prevention.

Feedzai boasts an impressive roster of clients, with some of the most renowned financial institutions among its customer bases. Notable names such as Citi, Fiserv, JP Morgan Chase & Co., and Lloyds Banking Group have entrusted the company with their fraud detection and risk management needs. These partnerships speak volumes about the level of confidence and recognition that Feedzai has garnered within the industry (Bourbon, 2021).

4. Macroeconomic Overview

Over the past decade, Portugal's entrepreneurial landscape, particularly in technology-based and technology-enabled startups, has experienced significant growth and transformation. This macroeconomic outlook delves into the period from 2011 to 2022, encompassing both periods of economic recovery from the global financial crises and the unprecedented challenges posed by the COVID-19 pandemic. Amidst the aftermath of the financial crises, Portugal's startup ecosystem emerged as a catalyst for economic revival, fostering innovation, job creation, and entrepreneurial opportunities. However, just as the ecosystem was gaining momentum, the onset of the COVID-19 pandemic presented new hurdles. The pandemic evaluated the resilience of startups, posing operational and financial challenges. Yet, it also accelerated digital transformation, creating new opportunities for technology-based startups to thrive. By analysing the developments during these critical periods, we can gain a comprehensive understanding of the growth, adaptability, and economic significance of Portugal's technology-focused startups in the face of both crises and opportunities.

Entrepreneurship in Portugal has witnessed a significant transformation in recent years, fostering a vibrant and dynamic business ecosystem. However, the capital market plays a vital role in fostering economic growth and development by providing a platform for companies to raise funds and investors to allocate their capital efficiently. Nevertheless, in the case of Portugal, the capital market has remained remarkably small and relatively insignificant compared to its European counterparts. Portugal's capital market has long struggled to attain a substantial market capitalization, which is a key indicator of the market's size and depth. Despite being a member of the European Union and sharing the Eurozone currency, Portugal's capital market pales in comparison to other European nations. According to The World Bank Group (2023), in 2018, Portugal had a mere forty listed domestic companies, accounting for less than 1% of the total number of listed companies in the European Union, which stood at 5,863. This significant disparity highlights the challenges faced by the Portuguese capital market and its limited size. The low percentage of companies belonging to the Portuguese market not only limits the investment opportunities available to investors but also hampers the overall competitiveness and attractiveness of the market. Encouraging more companies to list and increasing the representation of Portuguese firms in the capital market is crucial to foster a more robust and thriving financial ecosystem in the country.

Several factors contribute to the irrisory market capitalization of Portugal's capital market. Firstly, the country's historical reliance on bank financing has hindered the development of alternative funding channels. Traditional banking sector dominance has discouraged companies from seeking equity financing through IPOs or issuing corporate bonds.

Moreover, the economy's structure, characterized by a high prevalence of small and medium-sized enterprises (SMEs), poses a significant challenge. SMEs, which form the backbone of the Portuguese economy, often lack the resources, expertise, and financial stability required to access capital markets. Consequently, these enterprises remain reliant on traditional banking channels, limiting the growth potential of the capital market.

Furthermore, the perception of risk associated with investing in Portugal's capital market has also played a crucial role. Historical events such as the global financial crisis and sovereign debt crisis have contributed to a lack of investor confidence. The lingering effects of these crises have made international investors wary of allocating capital to Portuguese equities, resulting in limited liquidity and reduced market capitalization.

The underdeveloped capital market in Portugal has a particularly significant impact on entrepreneurs, startups, and the emergence of unicorns within the country. Insufficient access to equity financing options makes it challenging for entrepreneurs to secure the necessary funding to launch and scale their innovative ventures as illustrated in both Figure 2 and 3. These findings resonate with the insights from the Portugal Startup Outlook (2021), a macro-level examination of startups originating from Portugal that are centred around technology or enabled by technology.

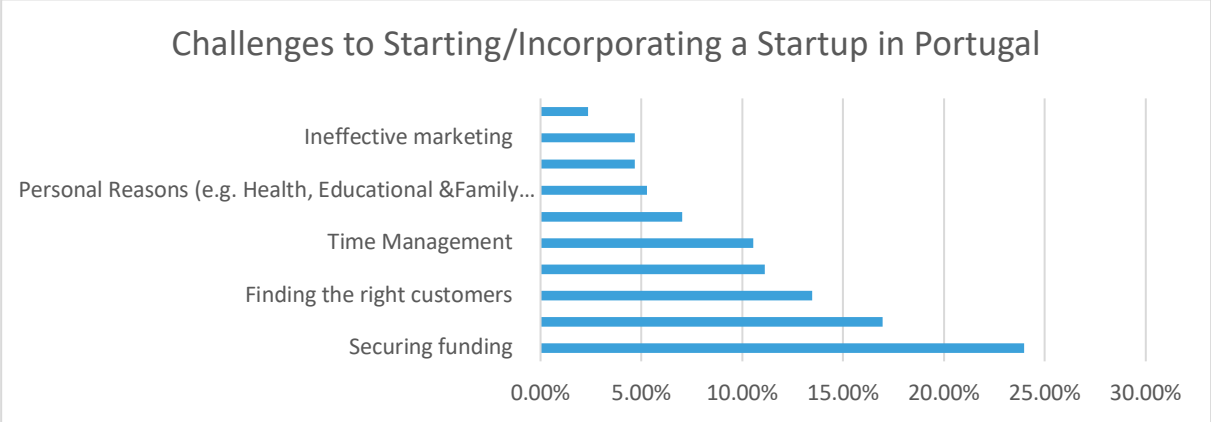

***Figure 2**: Challenges to Starting/Incorporating a Startup*
Source: adapted from Portugal Startup Outlook 2021.

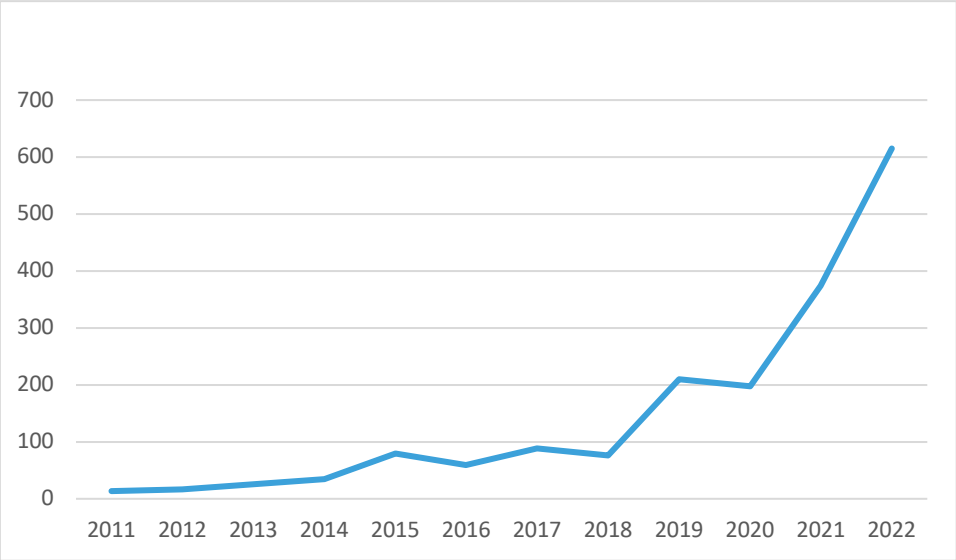

***Figure 3**: Venture capital investment into Portugal headquartered startup*
Source: Dealroom (2023) in million dollars. Due to report lag, the last 12 months are systematically under reporting especially on early-stage rounds.

Nevertheless, despite the dauting challenges faced by entrepreneurs in securing funding, venture capital investment remains a prominent source of financing in Portugal. According to the Startup & Entrepreneurial Ecosystem (2022), venture capital firms are the most common investor type in the country, enabling Portugal to attract top-tier international talent and secure substantial investment from external sources. Over the past decade, Portugal has experienced a remarkable increase in capital raised, with an impressive growth rate of 3,720%. This achievement is exemplified by the substantial investment of $615 million made in the most recent year.

These figures underscore the increasing confidence of venture capitalists in Portugal's entrepreneurial landscape, driven by factors such as a thriving startup ecosystem, a skilled talent pool, and supportive government initiatives. Notably, programs like Portugal2030, SIFIDE II, and Recovery and Resilience Plan (PRR) have played a crucial role in providing financial support, incentives, and grants to Portuguese companies, fostering innovation, entrepreneurship, and the development of high-growth potential ventures. These initiatives further enhance Portugal's appeal as an attractive destination for venture capital investment. Furthermore, these contributions have propelled Portugal to its 32nd position in the Global Innovation Index (World Intellectual Property Organization, 2022), recognizing the country's commitment to nurturing innovation-driven growth, fostering a culture of creativity, and harnessing the potential of its human capital and resources.

Additionally, Portugal's attractiveness as a destination for foreign direct investment (FDI) is evidenced by its ranking as the sixth most attractive country in this year EY Attractiveness Survey (EY, 2023), with a notable improvement of two places compared to the previous year's report. Portugal's FDI has witnessed an impressive growth of 24%, further highlighting its appeal and the increasing opportunities it offers for international investors.

Startups often require substantial investments to fuel their growth and expand into new markets. With limited capital market resources available domestically, many entrepreneurs are forced to seek funding from international sources, which can be a discouraging task due to the perceived risk associated with investing in Portugal's capital market.

As a result, it is observable a trend where Portuguese startups and entrepreneurs, especially those with high-growth potential that become unicorns like OutSystems, Talkdesk, Remote, Sword Health and Anchorage Digital, choose to relocate or establish their headquarters in countries like the United States or, in the specific case of Farfetch, the United Kingdom. The USA capital market, known for its depth, liquidity, and access to venture capital, offers greater opportunities for startups to secure substantial funding and attract top-tier investors. The more vibrant ecosystem and investor community in the USA provide a conducive environment for entrepreneurs to thrive and scale their businesses.

Moving their headquarters to countries with more robust capital markets allows startups to tap into a broader range of funding options, including venture capital, private equity, and IPOs. This relocation provides them with access to a larger pool of investors, mentors, and business networks that can contribute to their growth and success. Additionally, a presence in a more developed capital market can enhance a startup's reputation, credibility, and valuation, facilitating future fundraising efforts.

The migration of headquarters from Portugal to countries like the USA not only impacts individual startups and entrepreneurs but also hampers the country's ability to retain and attract top talent and foster a thriving entrepreneurial ecosystem. The loss of innovative startups and potential unicorns can have long-term consequences for Portugal's economy, as it misses the job creation, technological advancements, and economic multiplier effects that accompany successful entrepreneurial ventures.

Connecting to broader macroeconomic indicators, the Portuguese ecosystem of startups has emerged as a notable contributor to the country's GDP, accounting, in 2021, for approximately 1.1% of the total economic output according to Portugal Digital (2022), which amounts to €214,741,009 thousand. The vibrant startup sector has not only fostered innovation and entrepreneurship but has also generated employment opportunities, with a total of 49,800 individuals employed by startups (Startup & Entrepreneurial Ecosystem, 2022) in various capacities. Notably, the significant presence of companies like Feedzai within the startup ecosystem has had a remarkable impact. Feedzai alone constitutes approximately 0.59% of Portugal's GDP, surpassing the market capitalization of several companies listed on the PSI-20 as shown in Figure 4, Portugal's main stock index, showcasing the substantial economic significance of unicorns within the capital market, as they rival or even exceed the market value of established companies in the country.

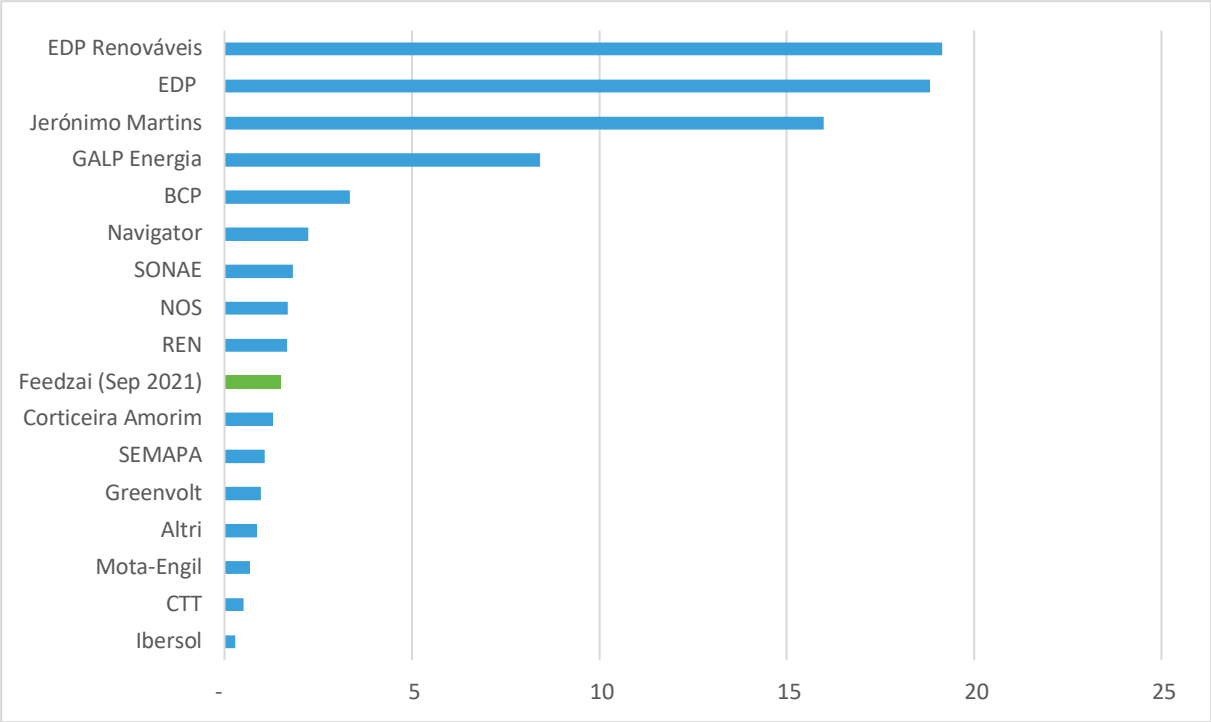

***Figure 4**: Portuguese Unicorn and the Capitalization of firms belonging to the PSI20*
Source: Capitalization on July 4th 2023 in billion euros (Jornal de Negócios, 2023)

Furthermore, the startup landscape in Portugal has experienced a remarkable surge in recent years. From 922 startups in 2011, the number has skyrocketed to 2,471 startups by 2022, according to Dealroom (2023). This growth signifies the increasing entrepreneurial activity and the ecosystem's ability to nurture and support new ventures. In comparison, the total number of registered companies in Portugal as societies rose from 367,950 in 2011 to 477,391 in 2021, reflecting the rising prominence and attractiveness of startups in the overall business landscape (PORDATA, 2023).

The Startup & Entrepreneurial Ecosystem (2022) collects the voice of the entrepreneurs that choose Portugal to build their companies and offers a comprehensive perspective on the current situation, the key stakeholders involved, the crucial performance indicators, and the dynamic evolution of the Portuguese ecosystem. The report sheds light on the thriving sectors within the country's startup landscape as presented in Figure 5. Among them, Enterprise Software emerges as a frontrunner, capturing 14% of the industry share. This underscores the substantial activity and promising prospects for software-driven solutions and technological advancements in Portugal. Additionally, the health sector holds a notable position, representing 13% of the industry share, indicating the increasing focus on innovative healthcare solutions. Furthermore, the marketing sector makes a significant contribution with 9% of the share, emphasizing the importance of creative and disruptive marketing strategies. These findings reflect the diverse entrepreneurial landscape in Portugal, where startups are making remarkable strides across multiple sectors.

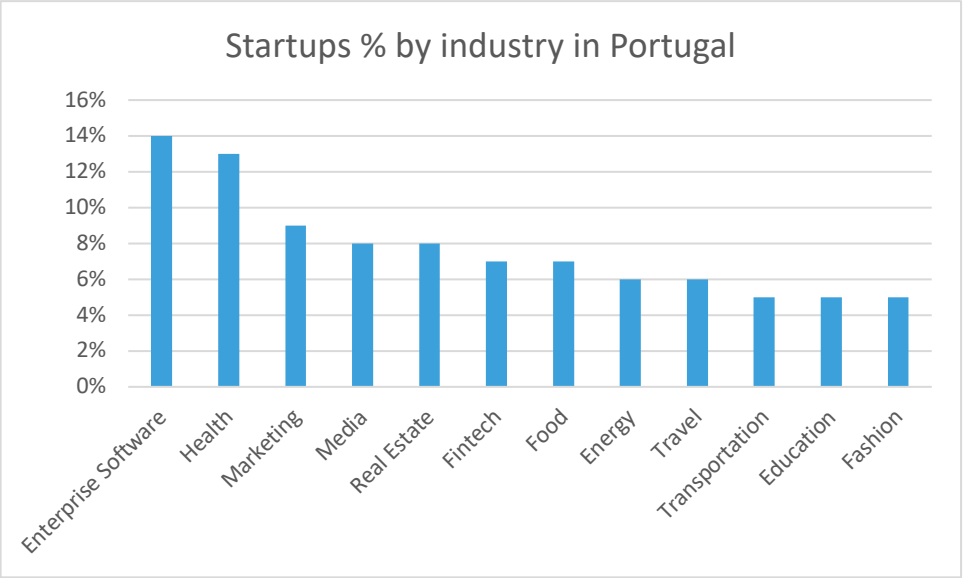

***Figure 5**: Startups % by industry in Portugal*
Source: Startup & Entrepreneurial Ecosystem (2022).

Moreover, the report highlights the distribution of startups across different regions as can be seen in Figure 6, revealing Lisbon as the most prominent hub with a significant share of 43.88%. Following closely is Porto with 21.43%, solidifying its position as a key player in the startup ecosystem. The central region of Portugal encompasses notable entrepreneurial hubs such as Coimbra, Aveiro, and Leiria, each making noteworthy contributions, having these regions gained recognition on a global scale, as indicated by their inclusion in the Global Rank & Change (StartupBlink, 2023). The presence of thriving startup communities in these regions signifies the broader geographical reach of Portugal's entrepreneurial landscape, fostering innovation and economic growth beyond the major metropolitan areas. This diverse distribution of startups across multiple regions showcases the country's commitment to nurturing entrepreneurial ecosystems and highlights the potential for further regional development and collaboration in the startup ecosystem.

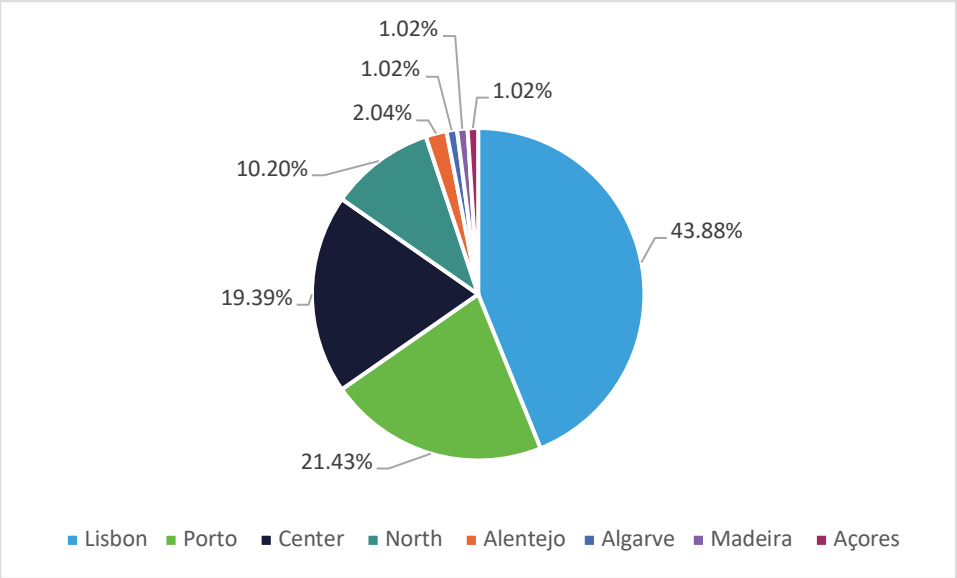

***Figure 6**: Distributions of Startups with Headquarters in Portugal*
Source: Startup & Entrepreneurial Ecosystem (2022).

In summary, the examination of Portugal's technology-based and technology-enabled startup ecosystem spanning from 2011 to 2022 illuminates its remarkable growth and resilience but also its challenges. Despite navigating through financial crises and the unprecedented hurdles of the COVID-19 pandemic, Portugal's entrepreneurial landscape has shown resilience and potential for economic revitalization. Government programs, increased venture capital investments, and the rise of unicorns have contributed to Portugal's position in global innovation rankings and its appeal to foreign direct investment. However, it is essential to acknowledge the difficulties that companies encounter in securing funding, as traditional banking channels dominate, and the capital market remains relatively small. The journey for entrepreneurs in accessing necessary funds remains a complex task, necessitating further efforts to expand the availability of financing options and foster a more robust capital market. Nevertheless, Portugal's startup ecosystem holds promise for economic growth and demonstrates the country's determination to cultivate innovation and entrepreneurship.

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5. Feedzai S.A. Valuation

This section initiates with the valuation of Feedzai by employing the DCF model through the FCFF. This involves projecting cash flows for a specified horizon of five years (2023F-2027F) and discounting these cash flows using the WACC. Beyond this initial projection period, I will incorporate a terminal growth rate aligned with the broader economic growth rate.

After deriving the valuation metrics for Feedzai using this methodology, I will proceed with a sensitivity analysis. This analysis is designed to explore the impact of the assumed terminal growth rate and WACC on the valuation results. The primary objective of this investigation is to ascertain the extent to which Feedzai's sustained growth has contributed to value creation, shedding light on its potential to generate value over time.

5.1. Valuation Assumptions

Before diving into the models, there is a crucial step that needs to be taken – setting up a range of assumptions that make sense both on a global scale and in the industry where Feedzai operates. This step is fundamental because these assumptions are building blocks of the whole valuation process. In the next part of this section, I will break down each of these key assumptions and explain why I am making them as they directly influence the results obtained.

The data concerning the valuation of Feedzai S.A. is sourced from multiple databases, including SABI, Informa DB, and Orbis. This data encompasses information from the company's Financial Statements, with a specific focus on the Income Statement, Balance Sheet, and Cash Flow Statement

5.2. Discounted Cash Flow Model

5.2.1 Revenues

Estimating future growth in revenues is a tough time. To estimate the expected revenue growth, it would be useful to get a sense of how the total market for computer software is expected to change or grow over time. Statista provides a forecast on the software market revenue growth, demonstrated in Table 2, and states that the worldwide software market is projected to experience consistent growth, driven by an increasing number of companies upgrading their fundamental operations.

Table 2: *Revenue growth forecast for the Software Industry*
Source: Statista (2023).

	2020	2021	2022	2023F	2024F	2025F	2026F	2027F
Revenue growth	2.59%	8.09%	6.16%	8.02%	6.04%	5.74%	5.35%	5.18%

However, Feedzai has not yet reached a phase of stable growth. According to Koller et al. (2020), economic stability for many high-growth companies is anticipated to manifest in the future, likely spanning a time frame of 10 to 15 years. Given Feedzai's ongoing organic revenue growth exceeding 15 percent annually, I will consider this growth trajectory until at least 2027, marking the completion of the company's 16th year. It is still going to grow at the pace of its revenue growth average for the last three years of 26.33%. During this period, it is reasonable to anticipate that Feedzai will sustain its growth pace, averaging 26.33% annually over the last three years. To ensure a more precise forecast of Feedzai's revenues, I will factor in the recent three-year growth pattern observed in the software industry, aligning it with the company's current growth trajectory as shown. As per my own estimations, Feedzai's revenue grows at an average of 5.56% more than the projections for the software industry (please see Annex H) which leads to the following revenue forecast stated in Table 3:

***Table 3**: Feedzai Revenue Forecast*
Source: Own estimates, Statista (2023).

	2023F	2024F	2025F	2026F	2027F
Feedzai's revenue growth	44.58%	33.60%	31.92%	29.74%	28.80%

5.2.2. Operating Margin

In most high growth firms it is more likely that the current operating margin changes over time, especially because negative operating margins are usual with high revenue growth sales. This scenario is currently applicable to the situation I am addressing. Although Feedzai, as a high growth company, has demonstrated expansion, it has not yet achieved profitability. After estimating the growth in revenues, my approach involves using the firm's anticipated operating margin for forthcoming years to estimate the operating income during those periods.

For firms to be valuable, the higher revenues eventually must deliver positive earnings which, within a valuation framework, translates to positive operating margins in the future. While valuing a firm in high growth I am focused on the operating margin that I expect the firm to have as it matures and that target will be the operating margin average for the market in which the firm operates, which stands at 18.28% as reported by Damodaran (2023) on his MarginGlobal.xls sheet.

It is believed that margin enhancements tend to be more pronounced in the earlier years and then gradually stabilize as the firm advances toward maturity. As previously mentioned, I am concluding this forecast for Feedzai as it enters its 16th year of existence, a phase that is presumed to exhibit signs of stability. Given these considerations, I am assuming a slower speed of convergence, assigning it a lag value on a scale ranging from 1 to 4 years, resulting in the outcome presented in Table 4.

***Table 4**: Operating Margin Forecast*
Source: Own estimates, SABI (2023), Informa (2023).

	2023F	2024F	2025F	2026F	2027F
Operating Margin	-15.90%	-9.06%	-3.60%	0.78%	4.28%

The operating margin has an intricate relationship with EBIT, which is estimated in Table 5. These metrics offer profound insights into the financial performance of a company, unveiling its operational efficiency and profitability with nuance. The operating margin provides a vantage point into the company's competence in translating revenue into operational earnings. Conversely, EBIT casts a wider net, encompassing not only operating income but also excluding the complex interplay of interest and taxes. Leveraging this synergy, EBIT is estimated through the calculated operating margin applied to projected revenues. This approach is particularly pertinent for a high-growth private enterprise like the one under scrutiny. By melding revenues and operational efficiency, this methodology offers a strategic lens through which we navigate the complexities of forecasting financial trajectory. Embracing the interdependence between these metrics, particularly in the context of dynamic growth, unfolds an intricate tapestry of insights that informs our comprehensive valuation narrative.

***Table 5**: EBIT Forecast*
Source: Own estimates, SABI (2023), Informa (2023).

€	2023F	2024F	2025F	2026F	2027F
Revenues	79,202,241	105,810,380	139,585,673	181,093,658	233,247,323
Operating Margin	-15.90%	-9.06%	-3.60%	0.78%	4.28%
EBIT	**-12,593,849**	**-9,591,394**	**-5,019,166**	**1,411,429**	**9,981,851**

5.2.3. Depreciation and Amortization

For the forecast of Feedzai's Depreciation and Amortization (D&A) the methodology is around employing a historical perspective. Specifically, by deriving the average D&A as a percentage of revenues by analysing the performance of D&A relative to revenues from 2020 through 2022. The calculations made, elaborated in Annex G, yield an average D&A rate of 6.74%. This implies that, on average, Feedzai's D&A expenses account for 6.74% of its revenues, as stated in Table 6.

***Table 6**: D&A's Forecast*
Source: Own estimates, SABI (2023), Informa (2023).

€	2023F	2024F	2025F	2026F	2027F
Revenues	79,202,241	105,810,380	139,585,673	181,093,658	233,247,323
% D&A to revenues	6.74%	6.74%	6.74%	6.74%	6.74%
D&A	**5,337,635**	**7,130,823**	**9,407,023**	**12,204,349**	**15,719,113**

The chosen method is carried on by a deliberate understanding of Feedzai's historical expense trends. Over the period under scrutiny, it is observed an upward trajectory in D&A expenses. This trajectory can be attributed to a range of factors, such as increased investments in basic equipment, and the need to amortize intangible assets. This upward trend underscores the company's commitment to enhancing its operational capabilities, although at the cost of higher D&A expenses.

5.2.4. Earnings Before Interest, Taxes, Depreciation and Amortization

Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) occupies a significant role within the framework of the FCFF model, serving as crucial in the analytical toolkit. While I refrain from making specific assumptions about its value, the data repository now stands equipped for its computation. EBITDA offers a panoramic view of a company's operational performance by excluding select non-operational and non-cash expenses. This metric, calculated as the difference between EBIT and D&A costs in Table 7, sheds light on the core earnings stemming from operational activities. This forecast, as shown in the subsequent table, captures the computed EBITDA figures, giving a glimpse of how it interrelates with EBIT and D&A. This highlights various facets of the company's financial story, offering a broader understanding.

***Table 7**: EBITDA Forecast*
Source: Own estimates.

€	2023F	2024F	2025F	2026F	2027F
EBIT	-12,593,849	-9,591,394	-5,019,166	1,411,429	9,981,851
D&A	5,337,635	7,130,823	9,407,023	12,204,349	15,719,113
EBITDA	**-7,256,215**	**-2,460,571**	**4,387,857**	**13,615,778**	**25,700,964**

5.2.5. Effective Tax Rate

Companies domiciled in Portugal are subject to taxation on their global income. A flat Corporate Income Tax (CIT) rate of 21% is applied to the aggregate taxable income of businesses considered tax residents within mainland Portugal, including Portuguese Permanent Establishments (PEs) of foreign entities. Additionally, specific municipalities impose a local surtax known as "Derrama", which can be as high as 1.5% of the taxable income. This surtax is computed before deducting any available carried-forward tax losses and is settled upon submission of the CIT return. Given this, the tax rate employed in the model aligns with the effective rate of 22.5% or 21% in the case of deferred taxes over tax losses carried forward.

5.2.6. Capital Expenditures

An observable surge in CAPEX is discernible when comparing the years from 2020 to 2022 (please see Annex I). This notable increase may be attributed to the strategic acquisition of Revelock's software

platform and to the company's introduction of the RiskOps platform, which underscores Feedzai's unwavering commitment to continued growth and sustained investment in its business operations.

As Feedzai continues to forge ahead in its trajectory of growth and innovation, it is foreseeable that CAPEX will continue to experience an upward trend. This aligns seamlessly with Feedzai's unwavering dedication to fortifying its business operations and sharpening its competitive edge. Given the absence of detailed insights into Feedzai's forthcoming investment strategies, the methodology for computing this parameter begins with the calculation of Net CAPEX, achieved by assessing the annual variation in fixed assets. Furthermore, the addition of D&A expenses to the Net CAPEX yields the comprehensive CAPEX figure. This approach is then substantiated by the application of the CAPEX-to-Revenues ratio spanning from 2018 to 2022, resulting in an average of 6.93%, as presented in Table 8.

***Table 8**: CAPEX Forecast*
Source: Own estimates.

€	2023F	2024F	2025F	2026F	2027F
Revenues	79,202,241	105,810,380	139,585,673	181,093,658	233,247,323
% CAPEX to revenues	*6.93%*	*6.93%*	*6.93%*	*6.93%*	*6.93%*
CAPEX	**5,488,992**	**7,333,029**	**9,673,775**	**12,550,424**	**16,164,855**

5.2.7. Working Capital

Feedzai's working capital was determined by evaluating the disparity between its operational current assets and operational current liabilities. The components under consideration were derived directly from the company's balance sheet and are presented in detail in Table 9.

***Table 9**: Working Capital*
Source: SABI, Informa, Own estimates, SABI (2023), Informa (2023).

€	2018	2019	2020	2021	2022
Accounts Receivable	19,593,930	19,235,300	35,704,535	21,819,639	32,809,675
Prepaid Expenses	891,163	696,883	821,032	1,781,424	1,544,785
Accounts payable	-17,943,940	-28,967,012	-48,377,285	-42,255,792	-33,537,506
Lease Liabilities	-	-480,920	-509,029	-543,662	-262,571
Deferred revenue	-12,440,300	-18,729,442	-21,818,119	-18,566,913	-22,104,054
Working Capital	-9,899,148	-28,245,192	-34,178,866	-37,765,304	-21,549,671
ΔWC	n.a.	-18,346,045	-5,933,674	-3,586,438	16,215,633

The methodical approach to forecast the working capital is recognizing the intricate interplay between the company's operational assets and liabilities and their direct correlation with revenue generation. By weighing the company's operational current assets and liabilities in proportion to the revenues generated in each corresponding year (please see Annex J), I aimed to craft a working capital projection in Table 10 that resonates with the evolving operational landscape.

***Table 10**: Working Capital Forecast*
Source: Own estimate, SABI (2023), Informa (2023).

€	2023F	2024F	2025F	2026F	2027F
Revenues	79,202,241	105,810,380	139,585,673	181,093,658	233,247,323
Operating Current Assets	49,671,341	66,358,520	87,540,548	113,572,100	146,280,045
as % of revenues	*62.71%*	*62.71%*	*62.71%*	*62.71%*	*62.71%*
Operating Current Liabilities	80,828,898	107,983,516	142,452,487	184,812,964	238,037,763
as % of revenues	*102.05%*	*102.05%*	*102.05%*	*102.05%*	*102.05%*
Working Capital	-31,157,557	-41,624,996	-54,911,939	-71,240,864	-91,757,718
ΔWC	**-9,607,886**	**-10,467,439**	**-13,286,943**	**-16,328,925**	**-20,516,854**

The presence of negative working capital within the company's financial structure takes on added significance when viewed in the context of its high-growth nature and substantial CAPEX investments seen in the section before. This deliberate allocation of resources to propel growth could contribute to a negative working capital scenario, driven by increased accounts receivable. While negative working capital might raise initial concerns, acknowledging the company's growth-driven CAPEX strategy offers a more holistic interpretation. Moreover, software companies often manage to maintain exceptionally minimal or even negative working capital due to their negligible ongoing expenses and absence of inventory-related costs.

5.2.8. Growth Rate

In the assessment of Feedzai's valuation, when applying the FCFF model, there is an assumption that cash flows will persist perpetually with a steady growth rate. However, I find it less reasonable to presume a consistent growth rate beyond the initial 5-year forecast. This is particularly relevant due to the distinct growth phases that companies of this nature tend to undergo. Hence, it appears more logical to divide this valuation into three distinct time segments: 2023F – 2027F; 2028F – 2037F; and 2038F – Perpetuity.

The first phase, spanning from 2023 to 2027, aligns with the present and is grounded in the current elevated annual growth rates predicted by software projections for that period, ranging from 28.80% to 44.58%. I anticipate this phase concluding by 2027, considering that by then, the company will be 16 years old and is expected to embark on a phase of economic stability, as already discussed in terms of revenue projections. The second phase, encompassing 2028 to 2037, entails an annual growth rate of 15%. This figure is chosen as it aligns with the minimum threshold for the company to still be classified as a high-growth firm, as defined by Koller et al. (2020). This phase's time frame coincides with Feedzai's 26th anniversary. This age corresponds with when revenue growth began to decelerate for two out of the four comparable companies, shown in Table 11, that will be mentioned downwards.

***Table 11**: Comparables Revenues Growth Analysis*

Source: Orbis (2023).

Company's Age					
Years	25	26	27	28	28
ACI Worldwide	-28.20%	17.41%	-4.82%	-2.59%	5.59%
Fiserv	24.70%	-11.10%	1.40%	3.80%	3.40%

Lastly, the third phase extends into perpetuity, with an annual growth rate equivalent to the global average inflation rate. This choice is based on the company's projected maturation and growth trajectory in tandem with inflation. The growth rate to be employed is derived from the anticipated inflation rate for 2028, which stands at 3.50% (International Monetary Fund, 2023). This selection accounts for the current geopolitical situation, such as the ongoing War in Ukraine, ensuring consistency with inflation expectations and worldwide consumption trends in the foreseeable future.

5.3. Discount Rate

5.3.1. Cost of Debt

I estimate the cost of debt in Table 12 by considering the types of debt that I anticipate the company will have in the upcoming periods. This estimation is derived from information extracted from the company's Annual Reports, specifically focusing on the total borrowing debt, which includes loans payable and financial lease liabilities which details are specified in Annex K. Additionally, I factor in the corresponding interest expenses borne by the company.

***Table 12**: Pre-Tax Cost of Debt*
Source: Own estimates, Informa (2023), SABI (2023).

Borrowings (€)	2019	2020	2021	2022
Current	544,665	544,743	594,892	338,803
Non-current	3,212,436	3,287,914	2,887,051	2,938,612
Interest expenses	193,559	174,688	153,391	166,488
Pre-Tax Cost of Debt	5.15%	4.56%	4.41%	5.08%

For a more accurate valuation, incorporating the after-tax cost of debt into the cost of capital calculation is crucial. This involves accounting for the tax benefits linked with debt financing. The officially mandated tax rate, referred to as the effective rate, and set by the pertinent tax authorities, stands at 22.5%. With this information, the calculation of the after-tax cost of debt can be accomplished using the following approach in Table 13:

***Table 13**: After-Tax Cost of Debt*
Source: Own estimates.

Pre-Tax Cost of Debt	5.08%
Statutory Tax Rate	22.50%
After-Tax Cost of Debt	**3.94%**

5.3.2. D/E Ratio

The high prevalence of equity in unicorn companies is driven by a number of factors, notably their high-growth nature, venture capital backing, and reduced exposure to financial risk. The prudent use of both debt and equity by a company is a significant indicator of a robust financial position. An optimal capital structure, characterized by a modest debt burden and substantial equity holdings, serves as a favorable signal of the company's investment attractiveness.

As a result of my own estimates shown is Table 14, the 2023F D/E ratio is calculated by dividing a company's total debt by its total equity and is equal to 2.57%, value assumed for perpetuity in the financial model. It is worth mentioning that the calculation of Feedzai's equity is based on accounting values, although market values are conventionally preferred. Given the prevailing influence of equity, any potential variance in the D/E ratio is anticipated to be minimal in this particular context.

***Table 14**: Capital Structure*
Sources: Own estimates, Informa, (2023), SABI (2023).

D/E Ratio	**2019**	**2020**	**2021**	**2022**
Total equity (€)	8,873,213	12,343,481	126,910,988	127,476,150
Total debt (€)	3,757,101	3,832,657	3,481,944	3,277,416
D/E Ratio	0.4234	0.3105	0.0274	**0.02571**

The table shows that the company's D/E ratio has decreased significantly over the past four years, a positive sign for the company that can be explained by the investment round made by KKR on Feedzai in 2021 and the acquisition of Revelock. It means that the company can be less reliant on debt to finance its operations, reducing the company's risk and making it more financially stable.

In the last few years, Feedzai has placed a significant emphasis on equity, aligning itself with its high-growth trajectory and substantial venture capital support. This emphasis, complemented by a low D/E ratio, enhances its appeal to potential investors and underscores a prudent financial approach geared towards long-term value creation. This strategic choice positions Feedzai to leverage its growth potential and venture capital backing for sustained innovation and expansion, instilling confidence in the company's future prospects.

5.3.3. Cost of Equity

To determine the cost of equity, a range of inputs is required, as elaborated upon in the literature review.

Risk-free Rate

The risk-free rate is the return that investors can expect to earn on an investment with no risk. To estimate the risk-free rate accurately, we calculated the daily average yield of the 10-year German government bond, a AAA-rated country, from July 2022 to July 2023. This resulted in a feasible rate of 2.15%, which we used to compute the cost of equity. For more information on this yield, please refer to Annex L.

Country Risk Premium

To estimate the CRP for Portugal, I calculated the daily average yield of the 10-year Portuguese government bond from July 2022 to July 2023. This resulted in a yield of 3.04%. As the CRP is the difference between the yield of a government bond in a particular country and the yield of a government bond in a AAA country. In this case, the difference is:

$$CRP = 3.04\% - 2.15\% = 0.90\%$$

This means that investors demand an additional 0.90% return on government bonds of Portugal over the return on government bonds of a AAA country.

Market Risk Premium

The methodology used to estimate the MRP consists of assessing Portugal's rating, which according to Moody stands at BAA2 and, subsequently, the default spread associated with this rating is simply added to the market premium of a mature market. The MRP used is 7.89% and it is estimated by Damodaran on its website.

Comparables

To estimate the beta of Feedzai, a private company, I set up a group of public comparable companies. These companies should belong to the same industry and have similar financial characteristics as Feedzai. However, this choice is not easy, as even if there are public companies in the same industry, they may not have similar financial characteristics as the private company. For example, the public companies may be larger or have different debt levels than the private company.

Nonetheless, I chose ACI Worldwide, FIS, FICO, and Fiserv as Feedzai's comparables. All these companies provide fraud prevention and security solutions, and they all have a similar business model to Feedzai. They also compete for the same customers. The comparables listed above are all larger and more established companies than Feedzai. However, they are all facing the same challenges, such as the increasing sophistication of fraudsters and the need to comply with regulations.

As a result, the comparables can be used to assess Feedzai's financial performance, its competitive position, and its growth prospects. The comparison between companies can be found in Table 15:

***Table 15**: Feedzai's Comparables*
Foundation, Headquarters, Industry, Business Model, Number of Employees and Geographic Reach source: Orbis (2023).
D/E ratio source: FICO, FIS, Fiserv and ACI Worldwide 2022 Annual Reports; Google Finance as of 21/09/2023.
Beta 5Y Monthly source: Yahoo Finance (2023) as of 21/07/2023.

Peer Group	**Feedzai**	**FICO (NYSE)**	**FIS (NYSE)**	**Fiserv (NYSE)**	**ACI Worldwide (NASDAQ)**
Founded	2011	1956	1968	1984	1975
Headquarters	Coimbra, Portugal	California, USA	Florida, USA	Winsconsin, USA	Florida, USA
Industry	Computer Software	Computer Software	Computer programming, data processing, and other computer related services	Computer Software	Computer programming, data processing, and other computer related services
Business model	Chain of transmission of financial operations from ecommerce and financial institutions	Chain of transmission of financial operations from ecommerce and financial institutions	Chain of transmission of financial operations from ecommerce and financial institutions	Chain of transmission of financial operations from ecommerce and financial institutions	Chain of transmission of financial operations from ecommerce and financial institutions
Number of employees	330	3404	69000	41000	3349
Greographic reach	Worldwide	Worldwide	Worldwide	Worldwide	Worldwide
D/E Ratio (%)	2.57%	18.33%	50.66%	32.71%	43.85%
Beta (5Y monthly)	n.a.	1.24	0.83	1.07	1.09

Beta

After establishing Feedzai's comparables, I estimated the beta of the private firm using the unlevering and relevering method. The first step was to calculate the unlevered beta of the public comparable companies, which is the beta of the companies without considering the effect of debt, using following equation 13. To derive the D/E ratio for the public companies in question, my initial step involved computing the market value equity for the comparables. This is achieved by multiplying the shares

outstanding from the companies 2022 Annual Reports for the share price on the same date. Simultaneously, the total debt is sourced from the 2022 Annual Reports of these companies. The resulting average D/E ratio for the public companies is 0.3639 and the average tax rate meets the assumption made in the model.

$$\beta_{unlevered} = \frac{1.0575}{(1 + \left(1 - \right.}{0.225}\left.\right)(0.3639))} = 0.825$$

This gave me an unlevered beta of 0.825 for the public comparable companies. The second step is to calculate the beta of the private firm. This is done by adding the effect of debt back to the unlevered beta of the public comparable companies. I used equation 14 and assumed D/E ratio assumption made in the model.

$$\beta_{private\ firm} = 0.825 * [1 + (1 - 0.225)(0.0257)] = 0.84$$

Upon computation, it results in a beta of 0.84 for Feedzai, indicating a lower level of risk compared to the public comparable companies, which hold an average of 1.058. This variance could be due to several factors. Feedzai's status as a private firm allows for greater operational flexibility and insulation from short-term market fluctuations, potentially contributing to a more stable risk profile. Additionally, its limited record in the market may lead investors to perceive the company as having less historical data available for assessment, which can result in a more conservative risk assessment.

Cost of Equity

Having outlined all the essential inputs, I proceeded to estimate the cost of equity using the CAPM framework, incorporating adjustments for the CRP:

$$r_E = (rf + CRP) + \beta L * MRP = (2.15\% + 0.90\%) + 0.84 * 7.89\% = 9.68\%$$

An overall cost of equity of 9.68% means that investors demand a return of 9.68% on their investment in Feedzai due to the perceived riskiness of investing in Feedzai either because it operates in a relatively new and rapidly changing industry or/and as it is a relatively young company or still in its growth phase, investors might see it as having higher uncertainty regarding its future performance, market penetration, and profitability.

5.3.3. Weighted Average Cost of Capital

The WACC considers the cost of funding through a blend of debt and equity, proportionally representing their utilization and thereby capturing the level of risk associated with the company's financial components. Leveraging the earlier calculated inputs, as presented in Table 16, enables the computation of the WACC using Equation 5.

***Table 16**: WACC Inputs*
Source: Own estimates.

WACC Inputs	
Cost of Equity	**9.68%**
Equity	**1**
Debt	**0.0257**
Cost of debt	**3.94%**
Tax Rate	**22.50%**
WACC	**9.51%**

$$WACC = r_E \times \frac{E}{D+E} + r_D \times \frac{D}{D+E} \times (1-t)$$

$$= 9.68\% * \frac{1}{1+0.0257} + 3.94\% * \frac{0.0257}{1+0.0257} * (1-22.5\%) = 9.51\%$$

5.4. Free Cash Flow to the Firm

Considering the established assumptions, I have performed the calculation of FCFF as detailed in the literature review. For a first analysis, I computed the FCFF for the first four years of Feedzai's activities in Table 17.

***Table 17**: FCFF from 2012-2015*
Source: Own estimates, SABI (2023), Informa (2023).

	2012	2013	2014	2015
Revenue Growth Rate	171.42%	13.40%	167.30%	97.55%
Revenues	1,079,190	1,223,855	3,271,341	6,462,414
Operating Margin	2.55%	-90.27%	26.35%	30.41%
EBITDA	176,068	-785,058	1,322,875	2,705,394
(-) Depreciation & Amortization	148,563	319,774	460,985	740,255
EBIT	27,505	-1,104,831	861,889	1,965,139
(+) Taxes	-6,189	232,015	-193,925	-442,156
NOPLAT	21,316	-872,817	667,964	1,522,983
(+) Depreciation & Amortization	148,563	319,774	460,985	740,255
Operating Cash Flow	169 879	-553 043	1 128 950	2 263 237
(-) Capex	157 144	335 945	447 513	775 355
(-) ΔWC	-1 815 661	1 887 997	1 904 940	2 633 151
FCFF	**1 828 396**	**-2 776 986**	**-1 223 503**	**-1 145 268**

Between 2012 and 2015, Feedzai's FCFF exhibited significant fluctuations, reflecting the company's changing financial performance. In 2012, Feedzai generated positive FCFF, indicating efficient financial management and solid operational performance. However, in subsequent years, FCFF turned negative, suggesting that expenses and investments exceeded cash generated from operations. This could be attributed to factors such as expansion efforts or market conditions.

Despite the negative FCFF, Feedzai experienced remarkable revenue growth, climbing from €397,615 in 2011 to €6,462,414 in 2015. This growth was fueled by innovation, customer focus, and a favorable market environment.

Feedzai also made significant strides in profitability, turning around a negative operating margin in 2013 to achieve healthier margins in the following years. This improvement was attributed to strategic investments in internal projects.

Reversal of FCFF Trends: A Closer Look at Feedzai's Financial Landscape

The second analysis focuses on Feedzai's most recent four years of activity presented in Table 18 below, spanning from 2019 to 2022.

***Table 18**: FCFF from 2019 to 2022*
Sources: Own estimates, Informa (2023), SABI (2023).

	2019	2020	2021	2022
Revenue Growth Rate	-1.48%	22.50%	30.62%	25.87%
Revenues	27,199,365	33,318,618	43,520,150	54,779,077
Operating Margin	-50.65%	-53.28%	-4.07%	-24.45%
EBITDA	-12,149,576	-15,854,124	2,030,772	-7,941,853
(-) Depreciation & Amortization	1,627,496	1,899,610	3,803,666	5,449,492
EBIT	-13,777,072	-17,753,734	-1,772,894	-13,391,345
(+) Taxes	2,893,185	3,728,284	398,901	2,812,182
NOPLAT	-10,883,887	-14,025,450	-1,373,993	-10,579,162
(+) Depreciation & Amortization	1,627,496	1,899,610	3,803,666	5,449,492
Operating Cash Flow	-9 256 391	-12 125 840	2 403 080	-5 129 671
(-) Capex	2 047 651	2 485 970	3 728 668	5 355 530
(-) ΔWC	-18 346 045	-5 933 674	-3 586 438	16 215 633
FCFF	**7 042 003**	**-8 678 136**	**2 260 850**	**-26 700 834**

Between 2019 and 2022, Feedzai's FCFF started to experience a reversal. In 2019, the FCFF was €7,042,003. However, in 2020, FCFF turned negative at -€8,678,136. This trend persisted in 2022, with FCFF at -€26,700,834. However, in 2021, Feedzai achieved a remarkable positive reversal, with an FCFF of €2,260,850. This shift reflected strategic maneuvers undertaken to reposition the company and its operations, notably KKR's investment in Feedzai.

Feedzai's case exemplifies the intricate interplay between rapid growth and the creation of sustainable long-term value—a delicate equilibrium that many high-growth firms aspire to achieve within the dynamic tech landscape. The company's early years were characterized by forceful revenue growth and positive FCFF, fueled by its commitment to innovation and the flourishing fraud prevention market. However, this journey underscores that unbridled growth alone does not ensure sustained financial viability. The pursuit of growth must be complemented by astute financial management, operational optimization, and adaptability to evolving market dynamics.

Growth is crucial, but it must be pursued holistically to foster sustainable value. Swift revenue expansion may captivate stakeholders, but authentic long-term value emerges through effective cost control, strategic decision-making, and adept navigation of challenges inherent in growth. Feedzai's financial trajectory encapsulates the peaks and troughs of a high-growth firm's journey. It underscores that while growth is foundational, it must be accompanied by a purposeful strategy, adaptability, and a clear alignment with sustained value creation. The intricacies and hurdles inherent in this pursuit symbolize the intricate interplay between growth ambitions and the achievement of enduring financial success within the dynamic tech landscape.

Estimated FCFF: Feedzai's Future Amidst Growth and Challenges

Table 19 below provides a breakdown of FCFF computation for the first-time horizon. With the growth-susceptible components projected, the formulation of the DCF-FCFF model becomes viable based on the gathered insights.

***Table 19**: Estimated FCFF from 2023 to 2027*
Source: Own estimates, SABI (2023), Informa (2023).

	2023F	2024F	2025F	2026F	2027F
Revenue Growth Rate	44.58%	33.60%	31.92%	29.74%	28.80%
Revenues	79,202,241	105,810,380	139,585,673	181,093,658	233,247,323
Operating Margin	-15.90%	-9.06%	-3.60%	0.78%	4.28%
EBITDA	-17,931,484	-16,722,217	-14,426,189	-10,792,920	-5,737,263
(-) Depreciation & Amortization	5,337,635	7,130,823	9,407,023	12,204,349	15,719,113
EBIT	-12,593,849	-9,591,394	-5,019,166	1,411,429	9,981,851
(+) Taxes	2,644,708	2,014,193	1,054,025	-317,572	-2,245,916
NOPLAT	-9,949,141	-7,577,201	-3,965,141	1,093,858	7,735,934
(+) Depreciation & Amortization	5,337,635	7,130,823	9,407,023	12,204,349	15,719,113
Operating Cash Flow	-4 611 506	446 378	5 441 882	13 298 207	23 455 048
(-) Capex	5 488 992	7 333 029	9 673 775	12 550 424	16 164 855
(-) ΔWC	-9 607 886	-10 467 439	-13 286 943	-16 328 925	-20 516 854
FCFF	**-492 612**	**2 688 032**	**9 055 050**	**17 076 708**	**27 807 047**

Considering the obtained forecasts for the next five years of Feedzai's activity, they offer intriguing insights into the company's potential trajectory based on its historical journey. The past years have highlighted Feedzai's ability to navigate a dynamic landscape marked by both growth and challenges. The anticipated financial performance for the coming years reflects a mixture of cautious optimism and ambitious growth aspirations.

While 2023 is estimated to continue with a FCFF of €492,612, this projection may indicate ongoing efforts to address existing challenges and implement strategic adjustments. The subsequent years present a progressively positive trend, with FCF projecting a noteworthy value of €2,688,032 in 2024, followed by €9,055,050 in 2025, €17,076,708 in 2026, and an impressive €27,807,047 in 2027. These projections suggest Feedzai's dedication to improving its financial health and executing its growth strategies effectively.

Feedzai's past challenges emphasize the importance of prudent financial management and operational agility, lessons that the company is likely to carry into the future. The repositioning efforts that led to the positive turnaround in 2021 demonstrate Feedzai's capacity to recalibrate its approach and tap into external resources for value creation. As the company navigates these next years, balancing the pursuit of growth with sustainable value creation will remain paramount.

The projected rebound in FCFF starting in 2024F could be indicative of Feedzai's strategic investments and operational optimizations paying off. However, it is important to acknowledge that growth projections come with inherent uncertainties and risks, especially in the ever-evolving technology landscape. Feedzai's journey is a testament to the complexity of achieving lasting financial stability amid a rapidly changing environment.

The estimated FCF figures for the upcoming years present a cautiously optimistic outlook, suggesting Feedzai's determination to transform challenges into opportunities. The company's past performance underscores the multifaceted nature of growth and value creation, emphasizing that a well-balanced approach and adaptability are key ingredients in charting a successful course in the unpredictable tech industry. The projected future aligns with Feedzai's history of navigating challenges, capitalizing on growth, and striving to achieve a sustainable and prosperous financial path.

5.5. Enterprise Value

When estimating the present value of the projected FCFF, it is crucial to underscore its significance as a fundamental financial principle employed to gauge the current value of forthcoming cash flows while considering the time value of money. This principle acknowledges that the worth of money today outweighs its future value, attributable to factors such as inflation and the potential for investment returns. Present value entails discounting future cash flows to ascertain their equivalent worth in today's context.

Given the FCFF computed before (see Table 19) it is possible to calculare the present value of those cash flows. First, I had to discount the estimated cash flows generated by the company in each year at the WACC to account for their present value. For the period of 2023F to 2027F I obtained the value of €38,209,777.

Furthermore, the present value of future cash flows for the years 2028F to 2037F, amounted to €233,249,749, capturing the collective present value of these projected cash flows during this extended period, reflecting their cumulative impact on the company's valuation. The perpetuity value's present value of €492,653,480 signifies the ongoing value of FCFF beyond the projection period, assuming a steady growth rate. This concept encapsulates the sustained value Feedzai generates over time.

The calculations of present value illustrated in Table 20 allow for the assessment of the current influence of Feedzai's impending cash flows, while duly considering the temporal element. This evaluation provides valuable insights into the sway of projected cash flows on the company's present value and financial trajectory.

***Table 20**: Enterprise Value*
Source: Own estimates.

€	2023F	2024F	2025F	2026F	2027F	2028F - 2037F	2038F - Perpetuity
FCFF	-492,612	2,688,032	9,055,050	17,076,708	27,807,047	649,274,403	116,398,589
@ WACC	9,51%	9,51%	9,51%	9,51%	9,51%	9,51%	9,51%
Growth Rate						15,00%	3,47%
Present Value	-449,816	2,241,263	6,894,115	11,871,924	17,652,290	233,249,749	492,653,480
EV	**764,113,005**						

The enterprise value of €764,113,005 for Feedzai raises interesting considerations, especially in the context of Feedzai being categorized as a unicorn, companies valued at over $1 billion, the enterprise value speaks to its potential for significant growth and impact within the industry.

While every effort has been made to ensure accuracy in the calculation of the EV, it is worth noting that some figures, including equity, are based on accounting values rather than market values. Given the particular circumstances, the EV may be slightly slower compared to its equity market value. However, any resulting discrepancies are not expected to be significant, especially in this context where equity plays a predominant role.

5.6. Sensitivity Analysis

Upon finalizing the model, a sensitivity analysis was conducted to delve into the influence of the WACC and the growth rate utilized for calculating the Terminal Value on Feedzai's enterprise value. This examination, outlined in Table 21, reveals the exceptional sensitivity of Feedzai's enterprise value to even minor adjustments. This heightened sensitivity emerges primarily due to the significant weightage of the terminal value in determining the company's overall value. The terminal value, derived from both the WACC and growth rate, serves as a cornerstone in this valuation approach. A marginal alteration in either of these variables cascades into considerable fluctuations in the Terminal Value, thus magnifying the impact on the company's overall enterprise value.

***Table 21**: Sensitivity Analysis*
Source: Own estimates.

		WACC				
		8,51%	9,01%	9,51%	10,01%	10,51%
Growth Rate	2,47%	857 444 399	766 786 252	690 090 954	624 524 361	567 960 450
	2,97%	910 912 722	809 260 813	724 274 242	652 344 649	590 823 824
	3,47%	974 980 832	859 396 342	**764 113 005**	684 416 019	616 932 863
	3,97%	1 053 147 564	919 470 951	811 137 327	721 793 456	647 031 497
	4,47%	1 150 642 008	992 765 383	867 483 949	765 912 513	682 109 818

While the WACC and growth rate underwent meticulous sensitivity analysis, variables like demand and price were excluded due to a combination of factors that hindered comprehensive examination within this study's scope. Notably, the scarcity of reliable data on Feedzai's product demand and pricing dynamics played a significant role. Given the pivotal importance of data accuracy in sensitive analyses, excluding these variables was a prudent choice. This focused approach, prioritizing WACC and growth rate without neglecting demand and price, reflects a judicious allocation of resources and analytical effort.

This method of sensitivity analysis allows for a more focused exploration of the key drivers influencing Feedzai's value. By concentrating on WACC and growth rate, rather than becoming entangled in the complexities of demand and price, a clearer understanding of Feedzai's true value emerges.

Conclusion

This project sought to determine the valuation of the exclusively Portuguese unicorn by examining the prevailing assessment techniques applied in practical situations, in addition to considering prospects related to the economy, the software industry, and the company itself.

The literature review focused on the landscape of start-ups, unicorns, fintech companies and providing insights into the multifaceted world of company valuation. The research primarily focuses on two pivotal areas: the historical evolution and characteristics of unicorns, and the intricate methodologies employed in valuing these unique entities. The analysis highlights crucial factors that influence a company's ascent to unicorn status, shedding light on the pivotal role played by strategic investors and growth strategies. The evaluation of these enterprises necessitates a nuanced approach, acknowledging the challenges posed by negative earnings and the critical role of robust valuation models. It culminates in a comprehensive examination of the DCF valuation, unravelling its key components and a robust framework for assessing the value of private firms, emphasizing the significance of accurate growth estimations. In an ever-evolving landscape of high-growth enterprises, this thesis underscores the enduring relevance of scenario-based DCF valuation, reaffirming its efficacy as a foundational tool in company valuation.

In reflection of the broader economic landscape, the entrepreneurial ecosystem in Portugal, particularly in technology-driven startups, has witnessed remarkable growth and transformation over the past decade. This macroeconomic perspective, spanning from 2011 to 2022, encompasses periods of recovery post-global financial crises and unprecedented challenges brought about by the COVID-19 pandemic. The startup ecosystem emerged as a catalyst for innovation, job creation, and entrepreneurial opportunities in the aftermath of the financial crises. Nonetheless, the capital market in Portugal faced hurdles in achieving substantial market capitalization, a critical factor in providing a robust platform for companies to raise funds and for investors to allocate capital effectively.

Transitioning from a macro perspective to a micro analysis, this study delves into Feedzai's financial trajectory, from its emergence as a unicorn to its current valuation. It illustrates the intricate balance between rapid growth and the establishment of sustainable long-term value. Early years saw robust revenue growth driven by innovation and an expanding fraud prevention market. However, excessive growth alone does not ensure sustained financial viability outlining the challenges faced by high-growth tech firms.

Anticipating the future, estimated FCFF figures reflect a blend of cautious optimism and ambitious growth aspirations. While 2023 may encounter challenges, subsequent years show a progressively positive trend, highlighting Feedzai's commitment to financial health and effective growth strategies.

Nevertheless, it is essential to acknowledge the inherent uncertainties in growth projections, particularly in the dynamic tech landscape.

The calculated enterprise value of €724,274,242 leads to the conclusion that the company is currently overvalued. However, this raises intriguing considerations, especially given Feedzai's unicorn status. This finding raises intriguing questions about the factors that are driving Feedzai's valuation. While financial performance and industry dynamics are important factors, it is also possible that investors are placing a premium on Feedzai's stock due to its unicorn status or its strong brand recognition. The theoretical underpinnings from the literature review offer a critical framework for assessing Feedzai's journey. As a unicorn, Feedzai embodies the characteristic high-growth trajectory often associated with such companies. However, my analysis suggests that Feedzai's current valuation is not justified by its financial performance or its industry dynamics. This finding reinforces the need for judicious financial planning and adaptability in the pursuit of sustained growth. If Feedzai is to maintain its unicorn status, it will need to demonstrate that it can generate the cash flows necessary to support its valuation.

Considering potential limitations, it crucial to recognize the evolving debt-to-equity ratios of unicorn companies, which can influence traditional financial metrics. As these companies go through successive funding rounds, their capital structure and ownership stakes can undergo substantial changes, potentially making it challenging to accurately assess their true value. Additionally, each funding round may bring in new strategic investors or venture capital firms, each with their own motivations and expectations for the company's growth and profitability. These factors can introduce complexities and uncertainties into the valuation process, making it crucial for analysts to carefully consider and account for the impact of these investment rounds. Moreover, another potential limitation lies in the reliance on publicly available data. Given that unicorns are often privately held companies, access to comprehensive and up-to-date financial information may be limited, leading to potential gaps or inaccuracies in the data used for valuation analysis. Furthermore, the unavailability of certain proprietary information or financial disclosures may hinder a complete understanding of the company's operations and financial performance. This reliance on publicly accessible data should be acknowledged as a potential limitation in the study.

This study provides a comprehensive understanding of Feedzai's financial journey, serving as a valuable resource for investors, stakeholders, and industry enthusiasts. It offers deeper insights into Feedzai's financial standing and the intricacies that shape its valuation. As Feedzai continues to navigate the dynamic tech landscape, the equilibrium between growth aspirations and sustainable value creation remains of vital importance.

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Annexes

Annex A – Balance Sheet from 2011 until 2015

BALANCE SHEET					
	2011	**2012**	**2013**	**2014**	**2015**
Non-current assets					
Property, plant and equipment	56,824.33	112,017.11	145,066.66	172,620.91	323,774.02
Intangible assets	469,188.11	865,199.40	1,278,230.74	1,589,543.45	1,105,107.55
Other assets	-	-	-	493.70	5,547.78
Deferred tax assets	-	58,792.92	562,180.93	551,688.92	506,187.00
Total Non-Current assets	**526,012.44**	**1,036,009.43**	**1,985,478.33**	**2,314,346.98**	**2,050,932.65**
Current assets					
Trade accounts receivable	183,439.64	278,638.21	905,385.16	1,814,838.01	2,407,309.54
Advances to suppliers	-	984.00	984.00	984.00	984.00
State and other public entities	-	12,509.64	20,338.54	74,939.37	72,650.81
Other receivables	526,773.72	623,041.00	673,522.07	1,683,414.91	4,299,071.24
Deferrals	-	15,041.44	118,807.01	132,960.21	634,187.16
Financial assets held for trading	-	-	500,000.00	-	-
Cash and cash equivalents	609,258.71	2,653,740.72	729,595.52	1,001,115.76	12,736,224.51
Total current assets	**1,319,472.07**	**3,583,955.01**	**2,948,632.30**	**4,708,252.26**	**20,150,427.26**
Total assets	**1,845,484.51**	**4,619,964.44**	**4,934,110.63**	**7,022,599.24**	**22,201,359.91**
Equity					
Share capital	73,500.00	90,000.00	108,067.50	108,067.50	150,855.46
Other equity instruments	-	-	-	695,000.00	1,745,000.00
Share premium	802,500.00	1,391,000.00	3,197,932.50	3,197,932.50	14,540,804.54
Other reserves	-	83,683.02	153,284.59	153,284.59	21,613.50
Legal reserves	-	4,404.37	8,067.95	8,067.95	250,706.27
Retained earnings	(6.39)	(6.39)	(43,764.59)	(657,661.04)	(87,422.72)
Other equity variations	461,902.83	401,907.86	529,113.28	632,134.04	443,273.95
Net income	88,087.39	73,271.54	(557,438.97)	768,628.27	1,600,628.55
Total equity	**1,425,983.83**	**2,044,260.40**	**3,395,262.26**	**4,905,453.81**	**18,665,459.55**
Non-current liabilities					
Loans payable	45,651.36	21,287.08	37,743.01	495,769.15	928,121.26
Deferred taxes	-	144,905.56	190,768.76	227,879.93	140,367.21
Total non-current liabilities	**45,651.36**	**166,192.64**	**228,511.77**	**723,649.08**	**1,068,488.47**
Current liabilities					
Trade accounts payable	939.31	12,087.26	105,633.03	156,584.49	746,196.89

State and other public entities	40,937.28	186,987.96	306,329.93	152,484.80	139,046.84
Shareholders	4,486.93	1,705,000.00	-	-	-
Loans payable	-	196,973.45	170,130.50	181,674.14	184,913.65
Other payables current	82,603.58	131,121.32	154,687.01	207,704.92	547,856.82
Deferred revenue	244,882.22	177,341.41	573,556.13	695,048.00	849,397.69
Total current liabilities	**373,849.32**	**2,409,511.40**	**1,310,336.60**	**1,393,496.35**	**2,467,411.89**
Total liabilities	**419,500.68**	**2,575,704.04**	**1,538,848.37**	**2,117,145.43**	**3,535,900.36**
Total equity and liabilities	**1,845,484.51**	**4,619,964.44**	**4,934,110.63**	**7,022,599.24**	**22,201,359.91**

Source: SABI (2023), Informa (2023).

Annex B – Balance Sheet from 2019 until 2022

BALANCE SHEET				
	2019	**2020**	**2021**	**2022**
Non-current assets				
Property, plant and equipment	1,005,015.17	578,774.86	541,653.08	557,076.24
Intangible assets	8,919,647.44	14,284,252.86	28,339,066.78	40,699,109.19
Rights-of-use assets	1,701,782.83	1,232,446.89	855,967.23	637,855.25
Investment in subsidiaries	2,764.24	72,681.82	16,479,111.08	21,412,006.28
Other assets	98,369.61	154,320.77	190,732.59	287,302.28
Deferred tax assets	12,623,775.68	16,170,850.27	24,597,574.57	34,596,899.77
Total Non-Current assets	**24,351,354.97**	**32,493,327.47**	**71,004,105.33**	**98,190,249.01**
Current assets				
Trade accounts receivable	13,116,604.74	24,324,265.12	8,154,414.73	10,292,511.42
State and other public entities	1,512,306.27	799,130.70	1,618,336.54	1,469,209.16
Other receivables	4,606,389.11	10,581,138.78	12,046,887.95	21,047,954.13
Prepaid expenses	696,882.84	821,032.47	1,781,424.36	1,544,785.38
Cash and cash equivalents	16,712,298.31	17,639,772.86	96,454,746.64	53,548,462.47
Total current assets	**36,644,481.27**	**54,165,339.93**	**120,055,810.22**	**87,902,922.56**
Total assets	**60,995,836.24**	**86,658,667.40**	**191,059,915.55**	**186,093,171.57**
Equity				
Share capital	170,153.70	170,153.70	208,939.37	209,444.31
Other equity instruments	1,745,000.00	1,745,000.00	2,662,291.69	3,013,366.45
Share premium	40,756,341.85	6,325,414.52	125,413,662.65	127,880,073.61
Other reserves	871,364.91	-	-	-
Legal reserves	3,065,831.04	871,364.91	879,682.57	879,682.57
Retained earnings	(26,093,581.27)	-	3,462,186.30	(2,007,747.45)
Financial assets adjustments	(239,083.43)	(239,083.43)	(245,840.48)	(308,910.05)
Net income	(11,402,813.56)	3,470,631.19	(5,469,933.74)	(2,189,759.42)
Total equity	**8,873,213.24**	**12,343,480.89**	**126,910,988.36**	**127,476,150.02**
Non-current liabilities				
Provisions	954,296.32	544,687.01	121,362.84	-
Lease liabilities	1,145,632.87	670,599.50	265,156.60	316,850.82
Loans payable	1,845,318.78	2,395,466.81	2,396,039.81	2,396,039.81
Total non-current liabilities	**3,945,247.97**	**3,610,753.32**	**2,782,559.25**	**2,712,890.63**
Current liabilities				
Trade accounts payable	1,784,865.53	31,465,127.39	17,990,933.34	10,098,119.37
State and other public entities	641,357.12	988,159.82	2,418,238.44	1,678,933.88
Shareholders	221,484.42	221,847.96	225,854.95	225,721.75
Loans payable	63,745.06	35,713.48	51,229.77	76,232.79
Other payables current	26,255,560.16	15,666,436.09	21,569,535.85	21,458,498.48
Lease liabilities	480,920.34	509,029.29	543,662.42	262,570.63

Deferred revenue	18,729,442.40	21,818,119.16	18,566,913.16	22,104,054.29
Total current liabilities	**48,177,375.03**	**70,704,433.19**	**61,366,367.93**	**55,904,131.19**
Total liabilities	**52,122,623**	**74,315,186.51**	**64,148,927.18**	**58,617,021.82**
Total equity and liabilities	**60,995,836.24**	**86,658,667.40**	**191,059,915.54**	**186,093,171.84**

Source: SABI (2023), Informa (2023).

Annex C – Income Statement from 2011 until 2015

INCOME STATEMENT					
	2011	**2012**	**2013**	**2014**	**2015**
	161%	**171%**	**13%**	**167%**	**98%**
Sales and services rendered	397,614.87	1,079,190.25	1,223,855.46	3,271,340.71	6,462,414.40
Grants	351,951.26	342,311.17	11,875.77	55,301.95	34,089.32
Gains / Losses from subsidiaries, associate and jointly controlled entities			(770.13)	-	110,316.30
Supplies and external services	(270,886.74)	(500,091.67)	(1,695,263.36)	(1,847,625.62)	(2,396,819.23)
Personnel costs	(572,038.88)	(850,047.16)	(1,074,050.98)	(1,118,001.81)	(2,098,134.59)
Own work capitalized	218,553.47	165,212.97	667,251.89	706,262.99	166,812.33
Impairment of trade receivables	-	-	-	(57,774.27)	(230,719.87)
Other operating income	2,151.50	4,149.53	178,245.67	338,722.04	1,070,266.32
Other operating expenses	(18,004.08)	(64,657.18)	(96,202.00)	(25,351.27)	(412,831.28)
EBITDA - Earnings before interest, taxes, depreciation and amortization	**109,341.40**	**176,067.91**	**(785,057.68)**	**1,322,874.72**	**2,705,393.70**
Depreciation and amortization	(20,726.30)	(148,562.78)	(319,773.70)	(460,985.38)	(740,254.64)
EBIT	**88,615.10**	**27,505.13**	**(1,104,831.38)**	**861,889.34**	**1,965,139.06**
Interest and similar income	6,789.77	14,144.40	24,433.81	4,661.74	15,760.85
Interest and similar expense	(1,412.60)	(3,250.62)	(3,493.32)	(42,368.55)	(90,778.27)
Profit before tax	**93,992.27**	**38,398.91**	**(1,083,890.89)**	**824,182.53**	**1,890,121.64**
Income taxes - year estimated	(5,904.88)	(23,920.29)	(34,778.76)	(238,504.21)	(498,858.39)
Income taxes - deferred		58,792.92	561,230.68	182,949.95	209,365.30
Net income for the period	**88,087.39**	**73,271.54**	**(557,438.97)**	**768,628.27**	**1,600,628.55**

Source: SABI (2023), Informa (2023).

Annex D – Income Statement from 2019 until 2022

INCOME STATEMENT				
	2019	**2020**	**2021**	**2022**
	-1.48%	22.50%	30.62%	25.87%
Sales and services rendered	27,199,364.75	33,318,618.04	43,520,149.76	54,779,077.01
Grants	182,851.97	182,472.56	5,759.87	10,392.04
Gains / Losses from subsidiaries, associate and jointly controlled entities	361.78	156,894.30	(572,318.06)	2,525,469.61
Supplies and external services	(30,559,327.96)	(15,268,375.37)	(29,686,681.48)	(48,922,267.62)
Personnel costs	(20,393,803.13)	(23,939,163.60)	(33,454,778.37)	(34,626,945.81)
Own work capitalized	5,967,042.17	6,300,906.25	9,290,660.77	16,851,300.59
Provisions (increases/decreases)	(22,504.81)	246,622.96	404,459.29	121,362.84
Other operating income	3,335,551.31	2,084,100.47	4,090,505.24	5,359,798.71
Other operating expenses	(1,563,660.38)	(1,051,303.54)	(1,539,609.93)	(2,299,791.36)
EBITDA - Earnings before interest, taxes, depreciation and amortization	**(15,854,124.30)**	**2,030,772.07**	**(7,941,852.91)**	**(6,201,603.99)**
Depreciation and amortization	(1,627,496.01)	(1,899,609.82)	(3,803,666.16)	(5,449,491.70)
EBIT	**(17,481,620.31)**	**131,162.25**	**(11,745,519.07)**	**(11,651,095.69)**
Interest and similar income	140,042.90	75,263.66	11,377.14	11,768.12
Interest and similar expense	(193,558.53)	(174,688.34)	(153,391.42)	(166,487.50)
Profit before tax	**(17,535,135.94)**	**31,737.57**	**(11,887,533.35)**	**(11,805,815.07)**
Income taxes - year estimated	6,132,322.38	3,438,893.62	6,417,599.61	9,616,055.65
Net income for the period	**(11,402,813.56)**	**3,470,631.19**	**(5,469,933.74)**	**(2,189,759.42)**

Source: SABI (2023), Informa (2023).

Annex E – Cash Flow Statement from 2011 until 2015

CASH FLOW	2011	2012	2013	2014	2015
Cash Flow from operating activities					
Receipts from customers	359,861.81	1,203,656.63	1,518,150.53	1,506,765.14	3,069,051.29
Payments to suppliers	(9,071.43)	(861,018.93)	(870,137.85)	(806,073.07)	(1,907,219.71)
Payments to employees	(275,961.72)	(754,681.32)	(1,152,549.19)	(986,315.99)	(2,060,655.93)
Cash generated from operations	**74,828.66**	**(412,043.62)**	**(504,536.51)**	**(285,623.92)**	**(898,824.35)**
Payments / receipts of income taxes	(5,904.88)	(17,954.17)	(17,386.06)	(17,004.43)	(16,851.74)
Other receipts / payments	(469,578.23)	(525,575.75)	(1,017,416.92)	(1,084,579.82)	(50,122.60)
Net cash flow from operating activities	**(400,654.45)**	**(955,573.54)**	**(1,539,339.49)**	**(1,387,208.17)**	**(965,798.69)**
Cash Flow from investing activities					
Payments related to:	**(73,728.61)**	**(660,178.49)**	**(544,007.01)**	**(57,479.83)**	**(22,379.85)**
Fixed assets	(68,759.82)	(60,178.49)	(44,007.00)	(57,479.83)	(22,379.85)
Intangible assets	(4,968.79)	-	-	-	-
Financial investments	-	(600,000.00)	(0.01)	-	-
Other assets	-	-	(500,000.00)	-	-
Proceeds related to:	**160,083.53**	**656,966.21**	**37,715.27**	**585,146.11**	**15,709.48**
Financial investments	60,000.00	601,740.00	-	-	-
Investment grants	99,497.39	55,226.21	18,375.96	83,529.75	-
Other assets	-	-	-	500,000.00	-
Interest received	586.14	-	19,339.31	1,616.36	15,709.48
Net cash flow from investing activities	**86,354.92**	**(3,212.28)**	**(506,291.74)**	**527,666.28**	**(6,670.37)**
Cash flows from financing activities					
Proceeds from:	**877,312.49**	**3,089,105.38**	**265,269.22**	**1,266,964.05**	**13,104,057.11**
Loans obtained	-	21,740.00	-	480,000.00	450,000.00
Realization of capital and other equity instruments	870,999.99	605,000.00	119,954.09	695,000.00	12,574,722.70
Grants and Donations	-	254,898.71	145,315.13	91,964.05	79,334.41
Other financing transactions	6,312.50	2,207,466.67	-	-	-
Payments related to:	**(3,561.24)**	**(85,837.55)**	**(143,783.19)**	**(135,901.92)**	**(396,479.30)**
Repayment of borrowings	(2,148.64)	(77,761.39)	(140,729.68)	(132,469.71)	(253,197.07)
Interests	(1,412.60)	(4,503.54)	(3,053.51)	(3,432.21)	(2,659.53)
Reductions of capital and other equity instruments	-	-	-	-	(140,622.70)

Other financing transactions	-	(3,572.62)	-	-	-
Net cash flow from financing activities	**873,751.25**	**3,003,267.83**	**121,486.03**	**1,131,062.13**	**12,707,577.81**
Net variation in cash and cash equivalents	**559,451.72**	**2,044,482.01**	**(1,924,145.20)**	**271,520.24**	**11,735,108.75**
Cash and Cash equivalents at the beginning of the year	49,806.99	609,258.71	2,653,740.72	729,595.52	1,001,115.76
Cash and Cash equivalents at the end of the period	**609,258.71**	**2,653,740.72**	**729,595.52**	**1,001,115.76**	**12,736,224.51**

Source: SABI (2023), Informa (2023).

Annex F – Cash Flow Statement from 2019 until 2022

CASH FLOW	2019	2020	2021	2022
Cash Flow from operating activities				
Receipts from customers	29,242,044.71	29,796,489.45	37,780,699.57	57,228,742.34
Payments to suppliers	(18,279,907.49)	(10,202,024.66)	(31,278,301.79)	(57,941,351.35)
Payments to employees	(17,432,614.93)	(17,612,691.70)	(22,854,543.00)	(28,841,408.60)
Cash generated from operations	**(6,470,477.71)**	**1,981,773.09**	**(16,352,145.22)**	**(29,554,017.61)**
Payments / receipts of income taxes	(1,275,950.67)	801,873.56	(287,390.68)	(926,407.40)
Other receipts / payments	1,271,425.31	1,758,589.13	1,456,591.33	4,146,700.27
Net cash flow from operating activities	**(6,475,003.07)**	**4,542,235.78**	**(15,182,944.57)**	**(26,333,724.74)**
Cash Flow from investing activities				
Payments related to:	**(2,442,220.11)**	**(9,328,086.19)**	**(12,293,004.45)**	**(15,986,521.29)**
Fixed assets	(614,031.21)	(27,671.08)	(102,669.68)	(196,631.49)
Intangible assets	-	(6,300,906.25)	(8,980,554.47)	(15,789,889.80)
Financial investments	(1,828,188.90)	(2,999,508.86)	(3,209,780.30)	-
Proceeds related to:	**4,453,736.35**	**7,945,415.22**	**1,381,717.53**	**101,619.48**
Financial investments	2,953,865.98	2,868,361.73	1,172,183.41	-
Investment grants	1,491,770.18	5,016,989.90	201,000.98	92,875.08
Interest received	8,100.19	60,063.59	8,533.14	8,744.40
Net cash flow from investing activities	**2,011,516.24**	**(1,382,670.97)**	**(10,911,286.92)**	**(15,884,901.81)**
Cash flows from financing activities				
Proceeds from:	**219,799.79**	**-**	**104,885,641.03**	**-**
Proceeds from issues of shares and other equity securities	219,799.79	-	104,885,641.03	-
Payments related to:	**(977,626.26)**	**(819,640.33)**	**(675,292.15)**	**(696,414.42)**
Repayment of borrowings	(783,404.90)	(626,405.90)	(556,710.86)	(637,384.06)
Payment of lease liabilities	(194,221.36)	-	-	-
Interests	-	(193,234.43)	(118,581.29)	(59,030.36)
Net cash flow from financing activities	**(757,826.47)**	**(819,640.33)**	**104,210,348.88**	**(696,414.42)**
Net variation in cash and cash equivalents	**(5,221,313.30)**	**2,339,924.48**	**78,116,117.39**	**(42,915,040.97)**
Exchange rate charges	585,637.16	(1,412,449.93)	698,856.39	8,756.80

Cash and Cash equivalents at the beginning of the year	21,347,974.46	16,712,298.31	17,639,772.86	96,454,746.64
Cash and Cash equivalents at the end of the period	**16,712,298.32**	**17,639,772.86**	**96,454,746.64**	**53,548,462.47**

Source: SABI (2023), Informa (2023).

Annex G – Projections for the software industry to Feedzai's Revenue Growth

	2020	2021	2022	2023F	2024F	2025F	2026F	2027F	Average until 2022
Revenue growth projections for the software industry	2.59%	8.09%	6.16%	8.02%	6.04%	5.74%	5.35%	5.18%	
Feedzai's revenue growth	22.50%	30.62%	25.87%	44.58%	33.60%	31.92%	29.74%	28.80%	**26.33%**
Projections for the software industry as a multiplicator of Feedzai's revenue growth	8.70%	3.79%	4.20%						**5.56%**

Source: SABI (2023), Informa (2023), Own estimates.

Annex H - % D&A's to Revenues Forecast

	2018	2019	2020	2021	2022	Average %
Revenues	27,607,301	27,199,365	33,318,618	43,520,150	54,779,077	
D&A	917,438	1,627,496	1,899,610	3,803,666	5,449,492	
% D&A to revenues	3.32%	5.98%	5.70%	8.74%	9.95%	-6.74%

Source: SABI (2023), Informa (2023), Own estimates.

Annex I – CAPEX Estimates

€	2018	2019	2020	2021	2022
Net CAPEX	-553,584	420,155	586,360	-74,999	-93,962
D&A's	917,438	1,627,496	1,899,610	3,803,666	5,449,492
CAPEX	363,854	2,047,651	2,485,970	3,728,668	5,355,530

Source: SABI (2023), Informa (2023), Own estimates.

Annex J – Working Capital Estimates

€	2018	2019	2020	2021	2022
Revenues	27,607,301	27,199,365	33,318,618	43,520,150	54,779,077
Operating Current Assets	20,485,093	19,932,183	36,525,567	23,601,064	34,354,460
as % of revenues	*74.20%*	*73.28%*	*109.63%*	*54.23%*	***62.71%***
Operating Current Liabilities	30,384,240	48,177,375	70,704,433	61,366,368	55,904,131
as % of revenues	*110.06%*	*177.13%*	*212.21%*	*141.01%*	***102.05%***
Working Capital	-9,899,148	-28,245,192	-34,178,866	-37,765,304	-21,549,671
ΔWC	-9,735,836	-18,346,045	-5,933,674	-3,586,438	16,215,633

Source: SABI (2023), Informa (2023), Own estimates.

Annex K.1. – Borrowings 2019

2019			
	<1 year	>1 year	Total
Loans Payable	63,745	1,845,319	1,909,064
Financial lease liabilities	480,920	1,145,633	1,626,553
Total	544,665	2,990,952	3,535,617

Source: SABI (2023), Informa (2023), Own estimates.

Annex K.2. – Borrowings 2020

2020			
	<1 year	>1 year	Total
Loans Payable	35,713	2,399,954	2,435,667
Financial lease liabilities	509,029	670,600	1,179,629
Total	544,743	3,070,553	3,615,296

Source: SABI (2023), Informa (2023), Own estimates.

Annex K.3. – Borrowings 2021

2021			
	<1 year	**>1 year**	**Total**
Loans Payable	51,230	4,101,040	4,152,270
Financial lease liabilities	543,662	265,157	808,819
Total	594,892	4,366,196	4,961,089

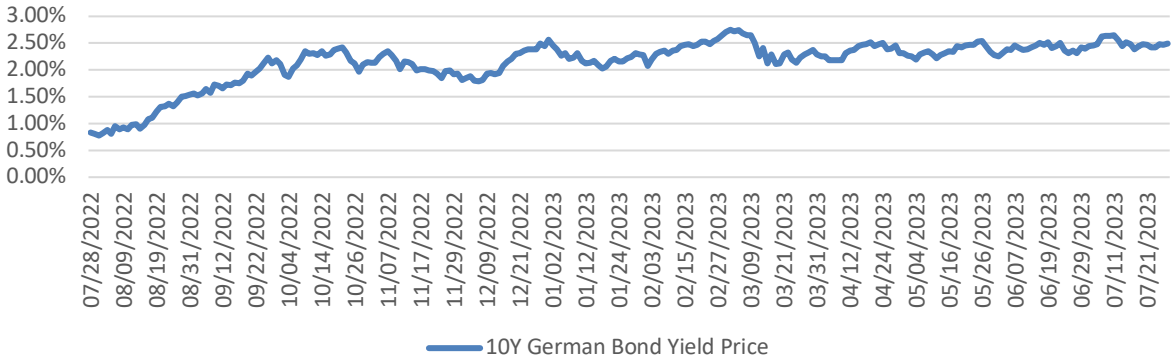
Source: SABI (2023), Informa (2023), Own estimates.

Annex K.4. – Borrowings 2022

2022			
	<1 year	**>1 year**	**Total**
Loans Payable	76,233	2,396,040	2,472,273
Financial lease liabilities	262,571	316,851	579,421
Total	338,803	2,712,891	3,051,694

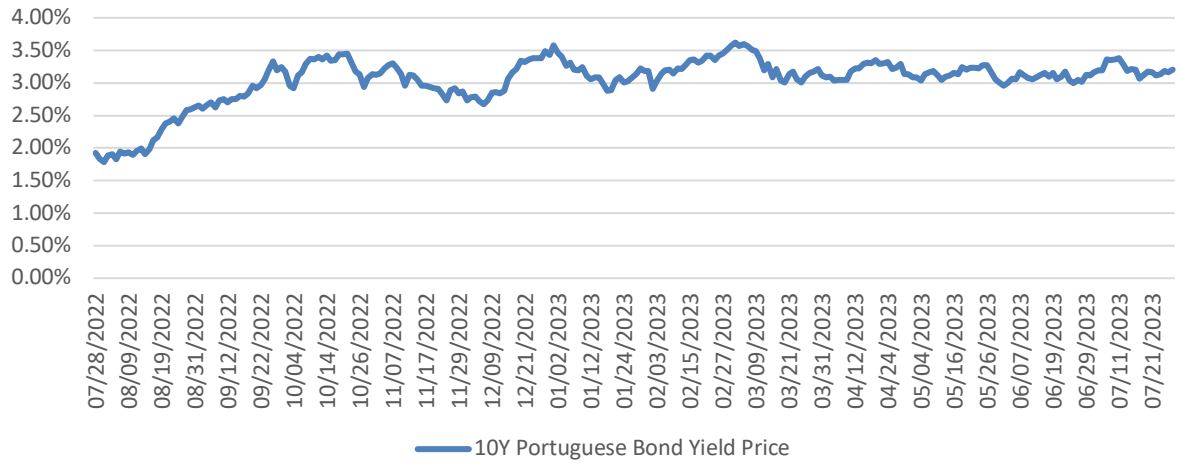
Source: SABI (2023), Informa (2023), Own estimates.

Annex L – 10Y German Bond Yield Price



Source: MarketWatch, https://www.marketwatch.com/investing/bond/tmbmkde-10y/download-data?startDate=7/28/2022&endDate=7/28/2023&countryCode=bx

Annex M - 10Y Portuguese Bond Yield Price



Source: MarketWatch, Source 10y Portugal: https://www.marketwatch.com/investing/bond/tmbmkpt-10y/download-data?startDate=7/28/2022&endDate=7/28/2022&countryCode=bx