MANVIA, S.A. EQUITY VALUATION

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ABSTRACT

This thesis aimed to conduct an equity valuation of Manvia, S.A., based on the calculation of its current shares' value.

Manvia is a company established in 1998, part of the Mota-Engil group. Although the company's core business is the provision of maintenance services, it also acts in the execution of construction works for both public and private sectors. Manvia's activity can be divided into three major business areas: Facilities, Environment, and Industry.

To reach the company's valuation, we relied on the Free Cash Flow to the Firm (FCFF) one of the Discounted Cash Flows (DCF) methods. Such was done by following certain necessary adaptations, since Manvia is a non-listed company. Due to this, one cannot recur to explicitly available market values, nor to readily available forecasts and assumptions as necessary for constructing the model.

The global context of economic, social and political uncertainty which has emerged during our work (augmented by the war in Ukraine) has not been neglected. This was factored in the assumptions and macroeconomic forecasts embedded in Manvia's valuation, contributing to the final estimates of 7.107.286 euros and a book value per share of 14,21 euros.

ABSTRATO

Esta tese teve como objetivo a realização de uma avaliação à empresa Manvia, S.A., tendo como base o cálculo do valor atual das suas ações.

A Manvia é uma empresa que foi criada em 1998 e pertence ao grupo Mota-Engil. Tem como atividade principal a prestação de serviços de manutenção, mas também valências na execução de obras nos setores público e privado. A atividade da Manvia pode ser dividida em três grandes áreas de negócio: Instalações, Ambiente e Indústria.

Para a avaliação da Manvia foi utilizado o Free Cash Flow to the Firm, um dos métodos de Discounted Cash Flows (DCF), com as devidas adaptações necessárias, dado que a Manvia não se encontrar cotada em bolsa e, por isso, ser impossível usar valores de mercado e, consequentemente, também as previsões e pressupostos necessários para a construção deste modelo. Durante a realização desta tese, perante o cenário que surgiu com a guerra da Ucrânia, a europa e o mundo estão confrontados com cenários económicos e sociais que geram uma grande incerteza mundial, estando a ser confrontados e arrastados para uma recessão

económica. Foi perante todos estes pressupostos e previsões macroeconómicas que, na avaliação da Manvia, procurou-se adaptar os seus valores e previsões a esta realidade política, social e económica. Com este método chegamos a um valor de capital próprio de 7.107.286 euros e a um valor contabilístico por ação de 14,21 euros.

Keywords: Manvia; Equity Valuation; Free Cash Flow; WACC; discount rate

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EXECUTIVE SUMMARY

Manvia, a non-traded market Portuguese company created in 1998 and belonging to the Mota-Engil group, has as its core activity the provision of maintenance services. Manvia's activity can be divided into three main business areas, Facility, Environment, and Industry. It mainly acts in the Portuguese market, although also taking over international projects.

The Facility business area provides a variety of specialized services, including hard services and soft services, as well as the specialized technical service. The Environment area integrates solutions for supply, operation and maintenance of the domestic and industrial waste sector. The Industry business area is divided into four main domains: decentralized production of energy and cogeneration; classification and loading of grinding bodies; lubrication; and industrial maintenance.

Since Manvia is not a listed company, its valuation was achieved using the free cash flow to the firm method. This led us to a result of 14,21 euros per share. It should nevertheless be called out that, as the calculation was obtained from book values (vs. market values), the analysis conducted entails some limitations

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1. INTRODUCTION

Equity valuation is a very useful tool to analyze the performance of companies, realizing whether they are creating or destroying value. Contrarily to what might be perceived, it should not be used only to support Mergers & Acquisitions, Initial Public Offerings or stock launches. It should be used frequently by the various shareholders of the company. The valuation of a company can be performed by different methods, which use different bases of analysis. But all of them require diverse scenarios and forward-looking assumptions to be considered. This is why valuation can be described as, "Valuation is both an art as well as a science" (Vishwanath, 2009).

The main goal of this thesis has been to run an equity valuation to the company Manvia, S.A. Manvia is a non-traded Portuguese company created in 1998, belonging to the Mota-Engil group, and whose main activity is the provision of maintenance services. It is a company holding the objective to solidify its position in the market and become a competing reference. Manvia has thus shown high levels of growth over the last few years, having increased and expanded its activity across different business areas sustained by a continuous process of learning and change.

This thesis is divided into three main sections: the literature review; the company setting and operational scope; and equity valuation method.

In the first section, the literature review explores the theoretical background of the different methods considered. Each method's parameters are explained and analyzed in detail. It is also verified for which purpose should each method be applied and their limitations.

In the second section, Manvia's activity and main business areas are presented and described. Some ratios and values that Manvia has presented over the years are also verified. Complementarily, we also went into the industry in which Manvia operates. In the end of this section, some important macroeconomic indicators in Portugal are observed, as well as how the worldwide economic, political and social changes have influenced them.

In the third and final section, the equity valuation of Manvia is carried out. This section covers the method applied in detail, supported by the forecasts and assumptions. The results obtained in the equity valuation are then subject to a sensitivity analysis to better account for the previously contextual uncertainty.

In the conclusion, it was made a reflection on the values obtained and the limitations of the method adopted.

2. LITERATURE REVIEW

2.1. VALUATION

"The value that investors place on a company is determined by their expectations of the value of the company's future cash flow." (Ding & Cao, 2011).

A company's valuation goes beyond of an analysis of its book values, it is required as well to know the expected future cash flows, the income to be generated, the investments to choose and its respective risks.

With the information obtained from the valuation, both managers and investors will identify improvement strategies; opportunities and weaknesses, as well as understand their performance expectations.

Several methods can be used to carry out a company's valuation, some of which will be analyzed in this section. Each valuation method differs from the others and for that reason they present challenges depending on the company to be evaluated. Although the differences, all methods must present the same outcome.

2.2. MARKET MULTIPLES METHOD

The market multiples method has as its premise that the value of a company will be the same as that of a company or a group of similar companies, using a financial or accounting multiple as a calculation.

To carry out this valuation, as mentioned by Goedhart, Koller, & Wessels, 2015 "Four basic principles can help companies apply multiples properly: the use of peers with similar ROIC and growth projections, of forward-looking multiples, and of enterprise-value multiples, as well as the adjustment of enterprise-value multiples for nonoperating items."

The key aspect behind a successful application of this method is the correct choice of its peer group, carried out through the recognition of businesses operating in the same industry and with an equivalent dimension. After this, it is essential to evaluate the similarity of the ROIC and growth rate of the peer group, excluding companies that present deviations.

Once the final peer group is selected, it is necessary to verify which multiple best suits the selected group, the industry activity, and the quality of the information obtained. The most used multiples are calculated from the PER (price per earnings ratio) or the Enterprise Value/EBITDA. The market multiplies method through its criteria selection basis, if applied in a proper way, will give more accurate financial forecasts.

2.3. DISCOUNTED CASH FLOW (DCF) METHODS

The discounted cash-flow methods "involve forecasting future cash flows and then discounting them to their present value at a rate that reflects their riskiness" (Luehrman, 1997). The discounted cash-flow methods differ in performance, mainly when measuring the tax shield associated with the different financed debt, which creates "many inconsistencies affecting both the value of the firm and the measurement of risk and return" (Oded & Michel, 2007).

Although this approach is a useful tool to value the assets in the present, it will "not capture the value of future growth opportunities" (Vishwanath, 2009).

There are four different discounted cash flow methods to evaluate a business: Free Cash Flow to the Firm (FCFF); Adjusted Present Value (APV); Equity Cash Flow (ECF); and Capital Cash Flow (CCF).

2.3.1. FREE CASH FLOW TO THE FIRM (FCFF)

The most common methodology adopted to value a company is the calculation of the Free Cash Flow to the Firm, which will "determine free cash flow to the business and discount the cash flows by weighted average cost of capital (WACC)" (Mitra, 2011).

$$FCCF = \sum_{t=1}^{n-1} \frac{FCF_t}{(1+WACC)^t} + \frac{FCF_n + TV}{(1+WACC)^n}$$

$FCF - Free\ Cash\ Flows$

$WACC - Weighted\ Average\ Cost\ of\ Capital$

$n - number\ of\ periods$

$TV - Terminal\ Value$

This approach is widely used in companies' valuation because takes into consideration a various range of factors, like its operational results, the investments' evolution, the cost of debt, the cost of equity, among others.

The Free Cash Flow to the Firm method should be used whenever a company is financed through both equity and debt, since the used discount rate (WACC) reflects the risk of the expected future cash flows (Vishwanath, 2009) and the tax shield of borrowing (Cooper & Nyborg, 2006).

However, as referred by Vishwanath (2009), this approach should only be used by listed companies, as the discount rate, WACC, is measured by market values. Whenever the company is not listed nor a similar listed company can be found, because presents different capital strucuture, the discount rate should be adjusted.

2.3.1.1. FREE CASH FLOW

The free cash flow represents the "cash flow available to all investors in the company – both shareholders and bondholders after consideration of taxes, capital expenditure, and working capital investment." (Vishwanath, 2009). The free cash flow can be calculated as follows:

Free Cash Flow=NOPAT + Depreciation - Capital Expenditure - Increase in Working Capital

The net operating profit after taxes (NOPAT) equals the earnings before interest and after taxes – EBIT*(1-T). When calculating NOPAT, the interest payments, the outgoings to the debt holders, are excluded because the tax shield on interests will be considered in the discounting rate (WACC). (Mitra, 2011)

For a company to maintain its level of growth, it should replace its fixed assets given their depreciation over time. Therefore, the calculation of free cash flows must deduct the non-cash expense of depreciation deducted from the net new investment in fixed asset.

In addition to the fixed assets' investment, companies need also to invest in current assets accounts, such as inventories and receivables. A company can as well be financed through non-interest current liabilities, such as accounts payable. The difference between these current assets and current liabilities is referred to as Working Capital. "The cash and other equivalents should not be considered in the Working Capital." (Vishwanath, 2009)

2.3.1.2. WEIGHTED AVERAGE COST OF CAPITAL (WACC)

The weighted average cost of capital is the discounted rate used in the free cash flow to the firm method and reflects the company's capital structure. WACC "embodies the relative proportion of debt and equity supplied by investors at the respective required rates of return" (Mitra, 2011)

Its mathematic expression will be:

$$WACC = \frac{E_{MV} * k_E + D_{MV} * (1 - T) * k_D}{E_{MV} + D_{MV}}$$

$E_{MV} - Equity's\ market\ value$

$k_e - Cost\ of\ equity$

$D_{MV} - Debt's\ market\ value$

$T - Tax\ rate$

$k_D - Cost\ of\ debt$

The product of the first two numerator's variables ($E_{MV} * k_E$) values how the equity holders (shareholders and bondholders) finance the company. The remaining variables "captures the cost of debt at the company's effective tax rate" (Mitra, 2011). The after-tax cost of debt is thus representing the tax shield inherent of interest from borrowing debt, being this expense tax-exempt.

WACC's formula takes equity and debt market values, which are obtained from stock prices (equity) and be estimated from debt holders' cash flow and the market interest rate (debt). (Mitra, 2011)

2.3.1.3. COST OF EQUITY

"The cost of debt and the cost of equity are both opportunity costs, each consisting of time value and its own risk premium" (Luerhman, 1997)

Shareholders expect for dividends or their investments' appreciation. The cost of equity represents the opportunity cost of choosing the investment over another, given the rate of return required by the equity investors (shareholders), compensating their risk of investing in the company.

The cost of equity can be calculated through the capital asset pricing model (CAPM):

$$k_E = r_f + \beta_E * (r_M - r_f)$$

$r_f - risk\text{-}free\ rate$

$\beta_E - equity\ beta$

$r_M - r_f - market\ risk\ premium$

2.3.1.4. RISK-FREE RATE

The risk-free rate is the return obtained from no-risk investments, as Treasuries or Governments Bonds. The U.S. Treasury Bills or the German Government Bonds with maturities between 10-15 years are frequently used as reference risk-free rates.

2.3.1.5. EQUITY BETA

Equity beta measures the systematic (volatility) risk of the company's share price when compared to its reference market. The higher the volatility of the share price, the higher the beta is, representing a greater risk against the market. So, it means that a company that has a high degree of risk (a high equity beta), holds a high cost of equity.

To calculate the equity beta, must estimate other traded companies' equity beta in the industry and unlevered them. The average of these estimates is then taken as the unlevered industry asset beta, which will give the equity beta through the following mathematical expression (Cooper & Nyborg, 2006):

$$\beta_E = \beta_U + (\beta_U - \beta_D) * \frac{D * (1 - T)}{E}$$

It is assumed that $\beta_D = 0$, so:

$$\beta_E = \left[1 + \frac{D * (1 - T)}{E}\right] * \beta_U$$

β_U – unlevered industry asset beta

β_D – *debt beta*

2.3.1.6. MARKET RISK PREMIUM (MRP)

"The market risk premium (MRP) reflects the incremental premium required by investors, relative to a risk-free asset like U.S. Treasury Bonds, to invest in a globally diversified market portfolio." (Zenner, Hill, Clark, & Mago, 2008)

When evaluating an investment decision, shareholders look from various economic and global factors, to be able to decide which projects create value for them, what return to demand, and what are the costs of the different financings. Shareholders frequently demand an estimate of the MRP, which encompasses all these aspects, reflecting their expected return.

"Understanding and quantifying the MRP is critical to the value-creation process." (Zenner, Hill, Clark, & Mago, 2008)

2.3.1.7. COST OF DEBT

The cost of debt is the interest rate paid by the company for all its debts, including loans and bonds, as a compensation for the risk exposure to lend to the company. Therefore, the cost of debt will help to understand the company's financial health, reflecting its default risk, since riskier companies present higher costs of debt.

Depending on whether the company is traded or not, and its financial information available, there are different ways to calculate the cost of debt.

If a company is market traded, the cost of capital is obtained from its YTM (yield to maturity), by adding to the risk-free rate the credit spread of the company (default premium at market value). Since debt is tax-deductible, the YTM is multiplied by 1 – Tax rate to obtain an after-tax cost of debt.

$$k_D = YTM * (1 - T) = (r_f + spread) * (1 - T)$$

If a company is non-market traded without a good peer group, its cost of debt is obtained by calculating the annual interest rate paid for all the debts. To do that, the total interest paid in the year should be divided by the total amount of debt, which is the company's average interest rate. Once again, to this result it is multiplied by 1 – Tax rate to obtain an after-tax cost of debt.

$$k_D = \frac{total\ interest\ paid}{total\ amount\ of\ debt} * (1 - T)$$

2.3.1.8. TERMINAL VALUE

"The terminal value is the present value of cash flows occurring after the forecast period." (Vishwanath, 2009) When a company is already in a stable phase, it is assumed that the business will grow at a constant growth rate (g) in perpetuity. So, the terminal value can thus be formulated as:

$$Terminal\ Value = \frac{CF_t(1 + g)}{WACC - g}$$

The growth rate (g) is usually calculated based on the historical inflation rate and the average GDP growth rate of the country where the company is located. It is also necessary to verify other political and macroeconomic indicators, such as political climate or commodity prices. Since it is assumed that the company's cash flows will grow at a constant rate in perpetuity, the terminal value has a big impact on a company's valuation. (Vishwanath, 2009)

2.3.2. ADJUSTED PRESENT VALUE (APV)

The Adjusted Present Value method "focused on two main categories of cash flows: "real" cash flows (such as revenues, cash operating costs, and capital expenditures) associated with the business operation; and "side effects" associated with its financing program (such as the values of interest tax shields, subsidized financing, issue costs, and hedges)." (Luerhman, 1997)

$$APV = Base\ case\ value + Value\ of\ financing\ side\ effects$$

The base case value represents the present value of the free cash flows whenever the company is financed only by equity. The value of financing side effects equals the present value of tax

saving created by leverage, such as interest tax shield, costs of financial distress, subsidies or issuing costs.

$$APV = \sum_{t=1}^{n-1} \frac{FCF_t}{(1+k_U)^t} + \frac{FCF_n + TV}{(1+k_U)^n} + VTS$$

$k_U - cost\ of\ capital\ (unlevered)$

$VTS - Value\ of\ Tax\ Shield$

Unlike the free cash flow to the firm method, which takes the tax shield from its discount rate (WACC), the adjusted present value method isolates this benefit, thus being more suitable to companies seeking for a specific amount of debt. (Vishwanath, 2009)

2.3.2.1. COST OF CAPITAL

The cost of capital, used in the APV approach, represents the opportunity cost of the expected return for shareholders if they had invested in another company with the same level of risk and only financed by equity (Luehrman, 1997). To reflect the risk inherent to unlevered cash flows, a discount rate obtained from the risk-free rate and the market risk premium of this asset is applied.

$$k_U = r_f + \beta_U * (r_M - r_f)$$

2.3.3. EQUITY CASH FLOW (ECF)

The equity cash flow method "estimates the residual cash flow available to equity holders of the firm after payments were made to other stakeholders" (Mitra, 2011). For this to be achieved, the future cash flows are adjusted by the after-tax interest and debt repayments and discounted by the shareholders required rate of return (k_E), explained in the section 2.3.1.3.

$$V(ECF) = \sum_{t=1}^{n-1} \frac{ECF_t}{(1+k_E)^t} + \frac{ECF_n + TV}{(1+k_E)^n}$$

Where the equity cash flows are calculated as:

$$Equity\ Cash\ Flow = Free\ Cash\ Flow - Interest\ and\ Debt\ Repayments$$

$$ECF = FCF + \Delta D - I(1-T)$$

$\Delta D - Increase\ in\ Dedt$

$I(1-T) - After-tax\ interest\ payment$

As the equity cash flow method estimates the value to be made available to shareholders, this approach should be applied in companies with high leverage and great variations in their debt. "An ECF analysis also shows explicitly how changes in ownership structures affect cash flow and risk, year by year, for the equity holders. Understanding how a program of change affects the company's owners helps to predict their behavior." (Luerhman, 1997)

2.3.4. CAPITAL CASH FLOW (CCF)

The capital cash flow method considers all the values available for both debt holders and equity holders, where the tax shields are added to the cash flows, discounted by a before tax rate.

$$V(CCF) = \sum_{t=1}^{n-1} \frac{CCF_t}{(1+WACC_{BT})^t} + \frac{CCF_n + TV}{(1+WACC_{BT})^n}$$

Where the capital cash flows are calculated as:

$$Capital\ Cash\ Flow = Free\ Cash\ Flow + Interest\ Tax\ Shield$$

$$CCF = FCF + I * T$$

Since the tax shields of debt are already reflected in the cash flows, the discount rate applied is a before-tax weighted average rate (Mitra, 2011). As this approach reflects the value available for all investors in the company's capital, the most appropriate discount rate to use is the before tax weighted average cost of capital ($WACC_{BT}$).

$$WACC_{BT} = \frac{D_{MV} * k_D + E_{MV} * k_E}{D_{MV} + E_{MV}}$$

The capital cash flow should be adopted when the company "is being restructured and has high leverage and complicated tax status resulting from net-operating losses (NOLs)" (Vishwanath, 2009).

The free cash flow to the firm method and the capital free cash flow method must give the same outcome.

2.4. DIVIDEND DISCOUNT MODEL (DDM)

The dividend discount model represents the future return for the company's shareholders, generated through the payment of their dividends in relation to to the cash flows generated by the company in the period. Therefore, the dividend discount model is the present value of the

expected future dividend payments *(Dividend per Share, DPS)* discounted by the cost of equity (k_E), explained in section 2.3.1.3. It assumes that the company will have a perpetual constant growth rate (g), (section 2.3.1.8) and can be formulated as:

$$P = \frac{DPS}{k_E - g}$$

The higher the cash flows, (the expected dividends), the higher the value obtained in the dividend discount model (DDM). On the contrary, the greater the company's risk, the greater the cost of equity, and the lower the value obtained in the DDM.

Given the constant growth rate assumed in perpetuity, the DDM model should be applied in stable companies. "Companies with a more erratic or cyclical earnings pattern, or rapidly growing companies, require a more complex dividend capitalization model framework that can accommodate differing dividend growth patterns." (Farrel, Jr, 1985)

Although this model is quite intuitive and can be applied to any expected cash flow and cost of equity, it does not consider "how the levered-equity are related to rates for unlevered equity, tax savings and debt". (Sweeney, 2013)

2.5. ECONOMIC VALUE ADDED (EVA)

The economic value added (EVA) method represents the real company's economic profit, being the additional value created through the company's activity, measured either through operating costs or financial costs.

"EVA is simply the NOPAT less the firm's book value multiplied by the average cost of capital (WACC)." (Fernández, Three Residual Income Valuation methods and Discounted Cash Flow Valuation, 2002)

$$EVA = NOPAT - (E_{BV} + D_{BV}) * WACC$$

$E_{BV} - Equity's\ book\ value$

$D_{MV} - Debt's\ book\ value$

$NOPAT - Net\ Operating\ Profit\ After\ Taxes$ (*explained in section* 2.3.1.1)

$WACC - Weighted\ Average\ Cost\ of\ Capital$ (*explained in section* 2.3.1.2)

"EVA summarizes in one concept the operational business and the capital market perspective" (Costin, 2017), as it uses both book values (through the NOPAT and enterprise book value) and market values (through WAAC).

The economic value added (EVA) approach is frequently considered one of the best performance evaluation measures, giving the creation of value for shareholders, obtained

through the difference in value created by the company's activity and the opportunity cost of capital. If EVA is positive, the operating income is higher than the company's cost of capital, meaning the company is generating wealth for its shareholders, its ultimate purpose. “EVA is the soundest performance metric, and the one most closely aligned with the creation of shareholder value.” (Costin, 2017)

However, being a short-term performance evaluation measure, the EVA method should not be used in companies with high growth or with high investment, as it will show that the company is destroying value, when is creating wealth to the shareholders.

3. THE COMPANY – MANVIA

Manvia is a non-traded market Portuguese company founded in 1998, being part of the Mota-Engil group's varied portfolio of companies. It is one of the key national players in the market of maintenance services, although also holding business in construction field for both public and private sectors.

Manvia's activity can be divided into three main business areas: Facility, Environment, and Industry. It operates mostly in the Portuguese market, but also has some international projects in its portfolio.

The Facility business area provides a variety of specialized services, including: facility management, which covers the subdomains of hard services (management and execution of maintenance of electricity , HVAC, water and sewage installations and equipment, constructive elements, among others) and soft services (management of external contracts - surveillance, cleaning, green spaces, security, vending, pest control, among others); design, implementation and auditing of scheduled maintenance plans; and the Specialized Technical Service.

Most recently, the scope of the Facility area was complemented by the execution of civil construction works (building rehabilitation), and with electromechanical works such as execution of electrical network, supply and installation of air distribution ducts in greenhouses, HVAC projects for installations and air conditioning requalification.

The Environment area integrates operation and maintenance solutions for the domestic and industrial wastewater, supply and waste sector. The services provided in the environmental business area encompasses activities such as: exploration, operation and maintenance of Water Treatment Plants (ETA), Waste Water Treatment Plants (WWTP) and Pumping Stations (EE); operation and maintenance of osmosis, microfiltration and nanofiltration systems ; design of water reuse systems using process effluents; exploration, operation and maintenance of infrastructure for the transport and distribution of water for irrigation or consumption; consultancy and specialized technical assistance in the areas of electrical maintenance, automation, instrumentation and mechanics; commissioning and start-up of sanitation and drinking water systems; consultancy on drainage systems and treatment of waste and drinking water; and preparation of exploration, operation and maintenance plans for environmental systems and manuals with a view to operating the facilities.

Recently, this business area as expanded its offer to water efficiency, namely, installation of flow measurement and control systems, pressure regulation and monitoring and detection of water leaks.

The Industry business area is divided into four main fields: decentralized production of energy and cogeneration; classification and loading of grinding bodies; lubrication; and industrial maintenance. The industrial maintenance activities are distributed across the areas of cement, steel, agri-food, oil, waste management and include global maintenance management; maintenance of electromechanical equipment (HVAC, electrical installations, pumping systems, fire systems, energy production units); industrial lubrication contracts (application, control, and supply of products); management, operation and maintenance of cogeneration plants; classification and loading of grinding bodies.

Manvia has both national and international high-value clients, including shopping centers, schools, concert halls, hotels, banks, transport infrastructure, industries, cement plants, hospitals, municipal water companies, among others.

Manvia's international business comes mostly from the industry and environment areas, with highlightable projects in Europe and Africa (respectively).

However, it should be noted that the projects in Africa are carried out through its main shareholder, Mota-Engil, which reduces Manvia's exposure to some of the risks inherent to these emerging markets (e.g.: exchange rate, financial, political risk, among others).

Manvia's added value comes from its engineering ranks. Its overall technical staff is predominantly diverse and young. This fact, along with the sustained headcounts growth throughout the recent years (Table 1), has been a key driver of the company's development.

YEAR	HEADCOUNTS	MIDDLE AND SENIOR MANAGEMENT
2019	502	91
2020	535	115
2021	581	136

Table 1 – Manvia's Headcounts (2019 - 2021)
Source: 2021 Company report

During its existence, Manvia has managed to consolidate its position in the national maintenance industry, showing consistent growth over the years and now stepping into its maturity phase.

Structure and Financial Indicators	2014	2015	2016	2017	2018	2019	2020	2021
Financial Autonomy	0,19	0,23	0,22	0,22	0,21	0,20	0,18	0,20
General Degree of Liquidity	1,12	1,09	1,06	1,10	1,16	1,20	1,22	1,24
Reduced Level of Liquidity	1,11	1,08	1,05	1,09	1,14	1,19	1,20	1,21
Debt Capacity	0,58	0,55	0,50	0,65	0,64	0,70	0,55	0,64
Debt to Equity	4,15	3,40	3,57	3,63	3,68	4,03	4,55	3,95
Financial Balance Minimum Rule	0,24	0,29	0,28	0,28	0,27	0,25	0,22	0,25
Ratio Net Debt to EBITDA	3,98	3,10	2,79	2,19	2,70	4,28	4,07	3,10
D/E ratio (book values)	4,15	3,40	3,57	3,63	3,68	4,03	4,55	3,95
Net Profit Rate	0,03	0,03	0,03	0,04	0,01	0,00	0,01	0,02
EBITDA Margin	0,08	0,08	0,08	0,08	0,05	0,03	0,05	0,05
Return on Equity	0,20	0,17	0,20	0,27	0,09	0,01	0,09	0,14
Return on Assets	0,04	0,04	0,04	0,06	0,02	0,00	0,02	0,03
Earnings per share	1,15	1,09	1,19	1,72	0,53	0,05	0,73	1,32

Table 2 – Manvia's Structure and Financial Indicators (2014 – 2021)
Source: Company reports and own calculations

As shown in the table above, Manvia's ratios have been stable over the last few years, even though the company has shown great growth in its activity.

On one hand, the high liquidity ratios indicate that Manvia's current assets cover all its short-term debts. On the other hand, the average financial autonomy ratio shows that the company is financed at 20% by equity and 80% by debt. This implies that Manvia is heavily dependent on debt capital to finance its assets. These values are supported by the low solvency ratio values, indicating, that equity does not coverage all its liabilities.

The decrease in profitability recorded in 2018-19 (see net profit ratio and EBITDA margin) started to be recovered in 2020-2021, amidst of the covid-19 pandemic crisis. This shows resilience and robustness in the recent growth strategy, with a positive trend depicted in both return on equity and return on assets. s. This happens because if the rentability decrease, the net profit disease as well, and the return obtained for the equity will be lower.

As for the earnings per share it is possible to observe that that it has steadily grown for most of the years reported (excepting 2018-19). And it is observed as well that Manvia is recovering from the bad performance that happened in 2018/2019, becoming a stable and profitable company again.

As far as competition goes, Veolia is to be called out as Manvia's main competitor. It operates in the same three business areas as Manvia, excluding the cements offer within the industry business area. Veolia has been present in the Portuguese market since 1992 and counts with approximately 800 employees. Although its wider core activity sectors are special technical installations, AC and energy, in Portugal it mostly acts in the areas of water, energy and waste management. Therefore, Veolia, like Manvia, had the need over time to evolve and expand its activities as the market needed.

In the facility management business area, it is also worthy to mention LMGE, Frostline and Openline areas relevant competitors. LMGE is part of an international group of companies

focused on maintenance management and related activities, also providing technical and energy efficiency consultancy, and project management services. Frostline and Openline, two smaller size Portuguese companies, focus on the AC related business. Frostline and Openline provide services both in the development of HVAC installations and in their proceeding preventive maintenance, and building maintenance and HVAC activities, respectively.

Regarding the environmental business area, Efacec, AGS and Lusagua can be named as the top national competitors. On the international market of the same business area, Acciona, BEWG and Aqualia should also be referred. AGS, Lusagua, Aqualia and BEWG's core activities are the provision of operation and maintenance services in water supply, drainage systems and wastewater treatment, the management of solid waste services and the management of services in the energy area. Efacec and Acciona also provide engineering services in the areas of energy and mobility/transport. It should be noted that there is high national and international competition in this business area, in the developed countries. This led some of the mentioned competitors (namely Efacec, AGS, Acciona and Aqualia) to diversify their approach to market and focus in the developing countries, targeting the offer in operation and maintenance of water supply, drainage systems and treatment of waters.

In the industrial business area, relevant competition can only be called out in the field of motor generators (leaving cement plants aside, for which Manvia stands as the only service provider in Europe): RS Motor and PowerUp are two international players specialized in the cogeneration, development, and production of sustainable energy generation products.

4. THE INDUSTRY

The industry in which Manvia operates, Maintenance and Various Engineering Services (Industrial, Environmental and Buildings), can still be considered to be an emerging one.
After the industrial revolution (1800's) and the subsequent construction boom (1900's), there was a need to provide several new services to the companies behind those phenomena.
Among those services, maintenance and energy efficiency management for both infrastructure and equipment arose as particularly demanded. Such occurred due to their direct impact on the businesses' profitability and performance.
The number and nature of service providers in this sector has increased and diversified over time. Such diversification has brought a need of specialization, while also promoting companies to grow by adapting their offer to each market's needs and expectations.

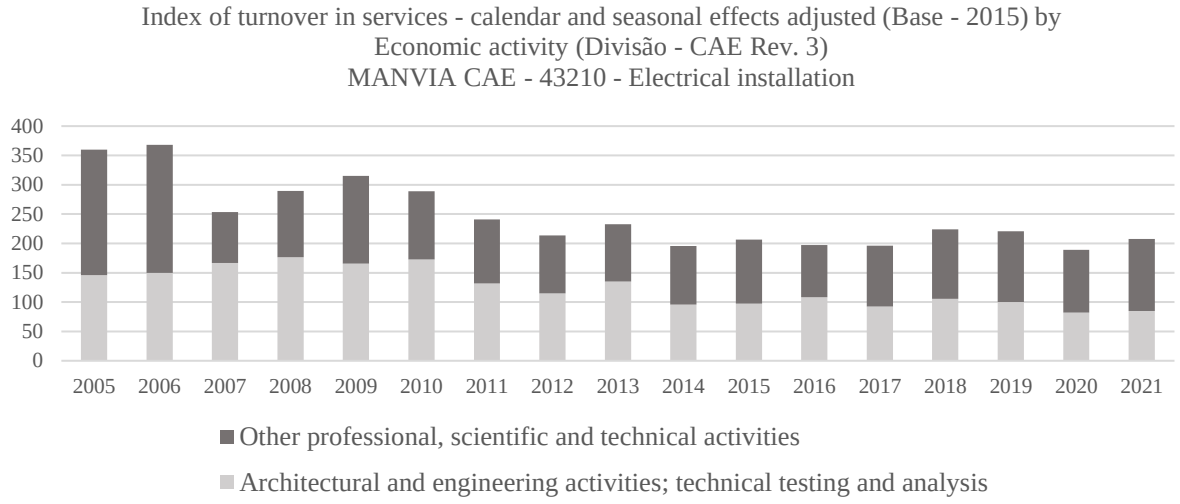

Figure 1 – Index of turnover in services - calendar and seasonal effects adjusted (Base - 2015) by Economic activity (Division - CAE Rev. 3) - Architectural and engineering activities; technical testing and analysis; and Other professional, scientific and technical activities. MANVIA CAE - 43210 - Electrical installation Source: INE

As observed in figure 1, this sector of activity is quite susceptible to economic, social, and political shocks. Over the years, events such as the subprime crisis (2007/2008), the IMF bailout of Portugal (2010-2013) and the Covid pandemic crisis (2020), have contributed to a decrease in the turnover of the companies in this sector.

5. PORTUGAL AND THE WORLD

Since 2020, the Portuguese, European and Worldwide economies have been characterized by strong political and social uncertainty. While still sustaining the effects of the covid-19 pandemic, the start of the war in Ukraine (February 2022) has triggered a whole new set of paths of instability in the world. These conflicts have had major repercussions around the world, be it from the economic, political, and social sanctions applied to Russia or Ukraine's inability to maintain its usual production of heavily exported goods.

These two countries are important exporters of energy sources (oil and gas) and the main producers of essential raw elements produce common foods and edible oils.

This context has triggered an exponential inflation rises. The latest Eurostat publications report a 2.6% inflation in the eurozone (2021) and project an almost doubling growth factor in 2022 (5.1%). This drives the countries' real GDP down and leads to recession. The same Eurostat publications report an eurozone's real GDP of 5,4% (2021) and a projection of 3,7% for 2022.

Growth and inflation projections for the euro area

(annual percentage changes)

	March 2022 projections				Adverse scenario				Severe scenario			
	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Real GDP	5.4	3.7	2.8	1.6	5.4	2.5	2.7	2.1	5.4	2.3	2.3	1.9
HICP inflation	2.6	5.1	2.1	1.9	2.6	5.9	2.0	1.6	2.6	7.1	2.7	1.9

Notes: Real GDP figures refer to seasonally and working day-adjusted data. Historical data may differ from the latest Eurostat publications due to data releases after the cut-off date for the projections.

Table 3 – GDP and inflation in euro area projection, in the adverse scenario and severe scenario | Annual rate of change, in percentage.
Source: Bank of Portugal, March 2022 ECB staff macroeconomic projections for the euro area

Regardless from the signs of recovery and growth from the recent years, Portugal is no exception to the eurozone's trend. Bank of Portugal projects an inflation of 4.0% for 2022 (according to the economic bulletin), representing a 3.1 pp rise vs. 2021. Differently, Bank of Portugal projects the country's real GDP to remain stable and ballparked at 4.9%. The latter can be explained by the fact that many of the economic effects are only factored in the savings later (the early 2023 projections indicate a drop of 2 pp).

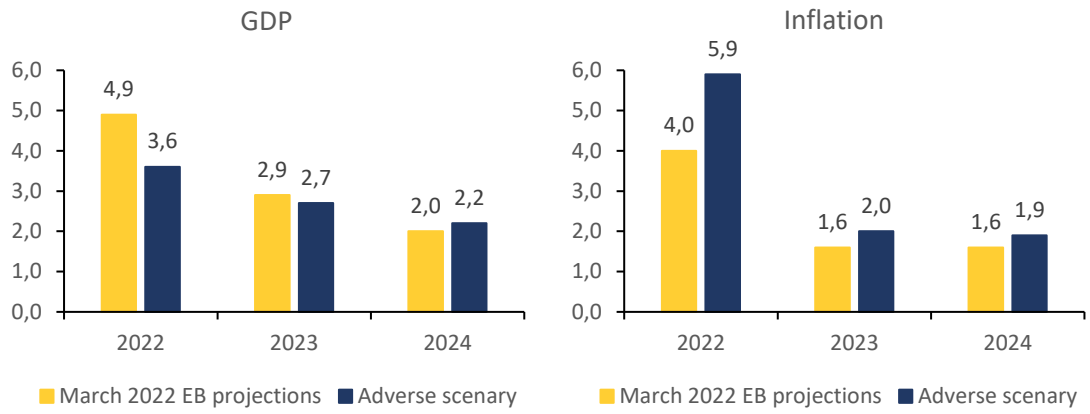

Figure 2 – GDP and inflation in Portugal in the March 2022 Economic Bulletin projection and in the adverse scenario | Annual rate of change, in percentage.
Source: Bank of Portugal, March 2022 Economic Bulletin

Following the current context of uncertainty, the macroeconomic indicators speculated for the near future indicate an upcoming adverse scenario. Such indicators are used in the next section as part of Manvia's equity valuation.

The increased cost of energy products and the overall receding demand can be correlated with the two mentioned macroeconomic indicators and have direct repercussions in Manvia's activity, due to the acquisition of various energy and non-energy products necessary for its activity.

6. MANVIA'S EQUITY VALUATION

6.1. INTRODUCTION

After the analysis and description of some valuation methods, an overlook was made through Manvia, its industry and Portugal macroeconomics. Now, in this section, the equity valuation will be applied to Manvia, where all components and assumptions will be explained.

As verified in the section 3, Manvia is an untraded company which makes the choice of the valuation method to adopted more challenging. The Future Cash Flow to the Firm, from the Discounted Cash Flow Methods, has been selected as the most adequate method for this matter, even though requiring some adjustments. As Manvia is an untraded company it was necessary to make some adjustment in the discount rate (WACC) as book values must be used.

Alternative approaches such as Multiples Methods and could not be followed, given that no significant peer group could be defined for Manvia (based on activity, size or ratios) and that Manvia has not emitted any market traded stocks.

The diversified capital and financing structure of Manvia, and its stable and secure position in its market, compared to the other methods presented, for the reasons explored in section 2, the Discounted Cash Flow was the method that best suited to the characteristics of Manvia, despite its disadvantages.

In the end of this section, the sensitivity analysis aims to help better understand the impact of the adjusted discount rate and perpetual growth rate assumption on the equity valuation, given their uncertainty and riskiness. Conceptually, these two components are expected to be sensitive to the contextual macroeconomic impacting the company. Furthermore, the fact that book values have contributed widely to the final valuation makes it practically relevant to map different ranges of input values to different assumption sets.

6.2. THE FREE CASH FLOW TO THE FIRM METHOD (FFCF)

6.2.1. DEBT VALUE

The debt value can be derived from book and market values. The debt book value is reported in the company's financial statements, while the debt market value represents the debt book value's worth to the market.

To calculate the discount rate, market values should be used as they will demonstrate what a company worth to the investors, but as Manvia is a nontraded company and does not have any suitable peer group it was not possible to find out a market value to it. While book values were used for sizing the short-term value of debt, its long-term market value was estimated applying

a theoretical rating[1]. These provide an approximation of Manvia's market value, required for adjusting the valuation's discount rate. Therefore, the final estimated value of debt is of 18.946.215,29 euros.

6.2.2. EQUITY VALUE

The equity value can be equally derived from book and market values. The equity book value is also found in the company's financial statements, while the equity market value equals the product of the outstanding shares units and the present value of the shares.

As happens to the debt value, it was not possible to estimate Manvia's equity market value, as it is a nontraded company, and so it does not present any outstanding shares in the market.

In 2021 the equity book value of Manvia was of 4.878.983,52 euros. Comparing it to the estimated value of debt shows that Manvia's capital structure is based on debt.

6.2.3. COST OF DEBT

The cost of debt was calculated based on Manvia's book values through the annual interest rate paid for all the debts:

$$k_D = \frac{total\ interest\ paid}{total\ amount\ of\ debt}$$

To compute it, Manvia's average indebtedness, both short-term and long-term, was calculated from statement lines such as loans, numbered accounts, confirming, overdraft. These figures, as well as their total associated cost were obtained from the company's financial statements, balance sheet and income statement. Manvia's estimated cost of debt is 3,89%:

$$k_D = \frac{206.979{,}96}{5.314.524.63} = 3.89\%$$

The value of Manvia's cost of debt is highly correlated with its default risk and the risk exposure attributed by the banks for lending to the company.

6.2.4. RISK-FREE RATE

As already mentioned in section 2.3.1.4., the risk-free rate represents the return obtained from no-risk investments, such as Treasury or Government Bonds. Since Manvia is a company from

[1] Rating computed by Damodaran Spreadsheet – "Ratings, Spreads and Interest Coverage Ratios"

a European country, the value of the 10-year German Government Bond was used with a value of 0,94%[2].

6.2.5. MARKET RISK PREMIUM

The Market Risk Premium, also known as Equity Risk Premium, represents the return which shareholders are expecting to collect from an investment with some risk. The market risk premium (MRP) equals the difference between the expected market return (r_M) and the risk-free rate (r_f).

$$MRP = r_M - r_f$$

Manvia's market risk premium was obtained from the Damodaran data, assuming Portugal as core location, resulting in a value of 6,12%[3].

6.2.6. BETA

Equity beta represents the systematic (volatility) risk of the company's share price compared to the market. As explained in section 2.3.1.5. to compute this coefficient, it will be necessary to obtain an unlevered industry asset beta, factored in as:

$$\beta_E = \left[1 + \frac{D * (1 - T)}{E}\right] * \beta_U$$

The unleveraged industry asset beta (β_U) was obtained from the Damodaran data. Through Appendix 04 it is possible to verify that the unlevered beta for diversified industry was 0,97. The adjusted equity beta calculated for Manvia is 4,01.

$$\beta_E = \left[1 + \frac{19.276.056,18 \ * (1 - 21\%)}{4.878.983,52}\right] * 0,97 = 4,01$$

6.2.7. COST OF EQUITY

The cost of equity represents the shareholders' required return, defined by their opportunity cost of investing in a project, compensating their risk.

[2] The value was obtained from https://www.bloomberg.com/markets/rates-bonds/government-bonds/germany on 29th April of 2022

[3] The value can be found in the Appendix 03, from the Damodaran data

The used cost of equity's calculation in the Manvia's valuation was the CAPM formula:
As explained in Section 6.1, the dividend capitalization model could not be applied given Manvia is an untraded market company. The CAPM formula, for which all terms were previously obtained, was used for calculating this value, resulting in a value of. 25,46%.

$$k_E = r_f + \beta_E * (r_M - r_f)$$

$$k_E = 0{,}94\% + 4{,}01 * 6{,}12\% = 25{,}46\%$$

Manvia's cost of equity is much higher than its cost of debt. This translates an expected exposure to market risks and weaknesses, given the high diversity which characterizes Manvia's core industry. This value is also a result of Manvia presenting itself in a growth phase, which increases the risk of the investment made by its shareholders.

6.2.8. WEIGHTED AVERAGE COST OF CAPITAL (WACC)

The discount rate used in the free cash flow to the firm method is the weighted average cost of capital (WACC). As stated in section 2.3.1.2, this discount rate reflects the company's capital structure, based on the required rates of return on debt and equity. It is calculated as follows:

$$WACC = \frac{E_{MV} * k_E + D_{MV} * (1 - T) * k_D}{E_{MV} + D_{MV}}$$

As all the previously obtained terms were calculated using Manvia's book values, those had to be adjusted to ensure closeness to market values. Such resulted in a WACC of 7,66%:
:

$$WACC = \frac{4.878.983{,}52 * 25{,}46\% + 18.946.215{,}29 * (1 - 21\%) * 3{,}89\%}{23.825.198{,}81} = 7{,}66\%$$

Manvia's weighted average cost of capital is relatively high, driven by its high costs of debt and equity presents themselves high. Being Manvia in a very diversified and new industry, makes risk associated of the shareholders' investments greater.

6.2.9. GROWTH'S RATE

As stated in section 2.3.1.82, to compute the growth rate (g) considered usually follows the inflation rate and the average GDP growth rate of the country where the company is based, coupled with other political and macroeconomic indicators.

		2021	2022	2023	2024
GDP	March 2022 EB projections	4,90	4,90	2,90	2,00
	Adverse scenario	4,90	3,60	2,70	2,20
Inflation	March 2022 EB projections	0,90	4,00	1,60	1,60
	Adverse scenario	0,90	5,90	2,00	1,90

Table 4 – GDP and inflation in Portugal in the March 2022 Economic Bulletin projection and in the adverse scenario | Annual rate of change, in percentage.
Source: Bank of Portugal, March 2022 Economic Bulletin

Analyzing the data obtained from the March 2022 Economic Bulletin of the Bank of Portugal, it is possible to verify that given the political, social, and economic crisis due to the war in Ukraine, inflation in Portugal is already showing exponential growth for 2022, compared to the previous year, projecting a value of 5,9%. However, for the following years, the growth of inflation decreases, presenting values close to the ones that we have been witnessing.

As expected, the projected growth rate of the real economy indicates an economic contraction to occur in the upcoming years (2022-2024).

Manvia's business plan still outlines a positive growth trend in the near future (although decelerating). This is sustained by a wide range of impactful public contracts which will be concluded. The contraction derived from the covid pandemic crisis and now with the war in Ukraine, makes the predicted scenarios more unstable.

Given the acknowledged economic instability, the growth rate factored in equals the expected real growth rate of the Portuguese economy in 2024, in an adverse scenario (2,2%).

6.2.10. THE FREE CASH FLOW TO THE FIRM VALUATION

To arrive to the enterprise value of the company through the free cash flow to the firm method, it is finally necessary to determine the expected annual free cash flows that the company will present in the future. As explained in section 2.3.1.1., the future expected free cash flows are calculated as follows:

Free Cash Flow=NOPAT + Depreciation - Capital Expenditure - Increase in Working Capital

Following this required all the revenues, expenses, new investments and financings to be projected for the future of Manvia. To do so, these necessary data were retrieved from the company's Business Plan and from information produced by each business area, further adjusted by assumptions on company and world reality.

Income Statement	**2018**	**2019**	**2020**	**2021**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**
Sales/Services	20.302	25.087	27.091	30.887	32.396	34.737	38.135	42.216	45.570

COGS	(2.759)	(3.413)	(3.322)	(4.753)	(4.386)	(4.611)	(4.970)	(5.567)	(6.131)
External services and suppliers	(8.481)	(11.226)	(12.071)	(12.911)	(13.859)	(14.971)	(16.362)	(18.051)	(18.974)
Personnel Costs	(8.895)	(10.299)	(10.934)	(12.248)	(12.972)	(13.720)	(15.061)	(16.730)	(18.370)
Impairments	(0)	(0)	(0)	(60)	0	0	0	0	0
Provisions	50	0	0	0	0	0	0	0	0
Other income and profits	742	671.510	512.351	539.013	103.876	115.412	51.938	131.586	104.563
EBITDA	**958**	**820**	**1.277**	**1.453**	**1.283**	**1.551**	**1.794**	**2.000**	**2.199**
Depreciation and amortization	(483)	(736)	(627)	(486)	(548)	(536)	(508)	(442)	(427)
EBIT	**476**	**84**	**650**	**967**	**736**	**1.015**	**1.286**	**1.557**	**1.771**
Interest and similar costs	(234)	(213)	(190)	(207)	(201)	(187)	(192)	(175)	(196)
EBT	**242**	**(129)**	**460**	**760**	**534**	**828**	**1.095**	**1.383**	**1.576**
Income tax	21	156	(93)	(98)	(125)	(174)	(230)	(290)	(331)
Net profit	**263**	**28**	**367**	**662**	**409**	**654**	**865**	**1.092**	**1.245**

Table 5 - Manvia's Income Statement Forecast, in thousands of euros
Source: Manvia's Report and own calculations

To determine the first calculation term, NOPAT, which is the earnings before interest and after taxes, Manvia's future EBIT was projected through its expected operating results (revenues and expenses), from which EBIT were deducted at the effective tax rate of 21%, in accordance with the Portuguese law in force.

To reach the forecasted EBIT, operating revenues are to be deducted from operating costs. First, it is necessary to forecast the expected operating revenues. Based on Manvia's Business Plan for the next years, its future objectives and targets, and the global macroeconomic changes, a growth rate of 4,89% was assumed for the first year, and 7,23%, 9,78%, 10,70% and 7,95% for the upcoming years.

The future expected growth reflects Manvia's plan of further developing itself as asset management company, gaining value not only through new contracts with new customers, but also gradually complementing the services already provided, with the performance of the three business areas, offering an increasingly complete service.

Regarding the operating costs, the same past cost structure was directly assumed (committing with Manvia's consolidation goals). In it, costs of goods sold and materials consumed weighted an average of 14% of the operating revenues, while external services and suppliers' costs and personnel costs weighted 43% and 40% of the operating revenue, respectively.

Lastly, after obtaining the revenues and operating costs for the upcoming years, it was possible to obtain the forecast Manvia's EBIT, from which was deducted at the effective tax.

It is important to mention that, for the calculation of EBITDA, the provisions already existing in the company do not undergo any change, since those refer to amounts that are under judicial study with the clients of the subsidiaries held by Manvia. However, as these companies are no longer in activity, there is low probability of change in this value. Indeed, the cost value that may result from these processes is already full assumed.

It should also be noted that the benefits of the affiliated companies were not considered despite Manvia exercising a significant influence on them. These are thus not reflected in the net income nor in the balance sheet considered in Manvia's valuation. Regardless, these subsidiaries have none or residual impact in the activity carried out by Manvia, and with little information that could be reflected in equity valuation.

The company's real fixed assets and the expectation of new investments were also mapped, either by the replacement of its assets depreciated through the time, or also by the investment and growth policy projected by Manvia. Through this, the capital expenditure and future depreciation values were obtained.

Capital Expenditure	**2018**	**2019**	**2020**	**2021**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**
Change in fixed Assets	-216	394	-298	315	-65	14	82	82	66
Depreciation and amortization	483	736	627	486	548	536	508	442	427
Capital Expenditure	267	1.129	329	802	482	550	590	524	494

Table 6 – Manvia's Capital Expenditure Forecast, in thousands of euros
Source: own calculations

As stated in section 3, after showing great growth over the years, which have led to a large investment, Manvia is gradually stepping into its maturity phase. Therefore, the company's investment strategy does not contemplate any large investments and rather focused on updating or the already owned assets.

Manvia's fixed assets are mainly tangible, with significant expressiveness in basic and transport equipment. These are critical to the execution of the company's core activity (maintenance services), it is of extreme importance to anticipate their full depreciation. It should also be noted that Manvia's policy on its assets promotes financial contracts (operational buildings through long term leases, or equipments through financial locations) over physical ownership. This reduces costs with maintenance and renewal and contributions to the fixed asset statement (being reflected in the external and suppliers' costs instead).

Finally, the investment in working capital was calculated, from Manvia's expected current assets accounts, such as inventories, receivables, other current debtors and deferrals, deducted by the non-interest current liabilities, such as payable accounts, state and public sectors, other current creditors and deferrals. The available cash is not considered in Manvia's investment in working capital, as that value will not be used for the operations. To obtain the necessary forecast values, the construction of the Income Statement Forecast (Appendix 2) and the Balance Sheet Forecast (Appendix 1) was completed. The remaining items that make up these two financial statements were derived from historical data assuming a financial evolution model already applied in the company. As for example, the inventories grow parallelly to the company's activity volume.

Based on these assumptions, Manvia's forecast investment in working capital was obtained as:

Investment on Working Capital	**2018**	**2019**	**2020**	**2021**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**
Current Assets (Without cash and inv.)	10.529	16.791	17.741	19.933	19.637	19.324	20.374	18.660	19.734
Inventory	194	128	285	503	685	749	957	1.049	1.245
Current Liabilities (non-financial)	7.798	11.845	12.449	14.178	13.806	13.158	13.439	11.187	12.123
Working Capital Requirements	**2.925**	**5.074**	**5.578**	**6.257**	**6.516**	**6.916**	**7.892**	**8.522**	**8.857**
Investment on Working Capital	**-347**	**2.149**	**503**	**679**	**259**	**399**	**976**	**630**	**335**

Table 7 – Manvia's Investment on Working Capital Forecast, in thousands of euros
Source: own calculations

Through all these forecasts and assumptions, Manvia's future free cash flow was calculated:

Free Cash Flow to the Firm	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**
EBIT	735.822	1.015.336	1.286.324	1.557.367	1.771.289
(-) Taxes in EBIT	172.343	213.221	270.128	327.047	371.971
(+) Depreciation and amortization	547.571	535.868	507.833	442.209	427.377
Cash Flow from Operations	**1.455.736**	**1.764.425**	**2.064.285**	**2.326.623**	**2.570.637**
(-) Investment on Working Capital	-259.445	-399.131	-976.015	-630.518	-334.545
(-) Capital Expenditure	-482.474	-549.974	-590.262	-523.992	-493.780
Free Cash Flow to the Firm	**713.817**	**815.320**	**498.009**	**1.172.113**	**1.742.311**

Table 8 – Manvia's Free Cash Flows to the Firm Forecast, in euros
Source: own calculations

After calculating the free cash flows for the upcoming years, it was now possible, applying the free cash flows to the firm method. Lastly, the previously obtained discount rate (weight average cost of capital – WACC) was applied to the free cash flows, obtained in sector 6.2.8. Its corresponding terminal value was based on the growth rate calculated in section 6.2.9.

From all the above, Manvia's enterprise value estimate obtained through the Free Cash Flow is 26.383.342,15 euros.

To conclude Manvia's equity valuation it was necessary to validate if the company will be creating or destroying value, based on the shares value. The 31 December of 2021 debt and equity values were taken as baseline, presenting themselves with a value of 19.276.056,18 euros, and 7.107.285,97euros, respectively. The accountable value of Manvia's shares was calculated by dividing the value of equity forecast by the number of company's issued shares – 500.000,00 with a nominal value of 1€.

Manvia's Equity Valuation	
NPV	3.842.484
Terminal Value	22.540.859
Enterprise Value	**26.383.342**
Book Debt Value	19.276.057
Equity Value	7.107.286
# Shares Issued	500.000
Share Price (Book Value)	**14,21**

Table 9 – Manvia's Equity Valuation, in euros
Source: own calculations

Concluding, the Free Cash Flow to the Firm method applied with the forecasts and assumptions described before results in an estimated book value of 14,21 euros, representing a variation of nearly 3%, since the book value of Manvia's shares in 2021 was 9,76 euros.

As mentioned in section 3, Manvia is currently starting its maturity phase, which was confirmed by the results obtained in the company's valuation, and with the main future objectives of the company: to solidify its activity, becoming a benchmark in the industry.

6.2.11. SENSITIVITY ANALYSIS

As has been mentioned throughout these sections, the equity valuation is carried out on various forecasts and assumptions. The assumptions inserted in Manvia's equity valuation have an impact on the discount rate (WACC) and on the expected growth rate, given their exposure to externalities. As previously stated, we are currently facing a great economic and political uncertainty, resulting from the war in Ukraine and new diseases that have emerged, which influenced on the economy of our families, our companies, our country, and the world.

Inflation, growth and interest rates will invariably change in light of the uncertainty brought by new global economic recession at sight. As shown, the first two factors, as shown in section

6.2.9, have direct influence on the growth rate applied to the terminal value taken. The last one impacts different variables part of the discount rate considered, the weight average cost of capital (WACC).

Share Price		WACC							
		7,00%	7,25%	7,50%	7,66%	7,75%	8,00%	8,25%	8,50%
Growth Rate (g)	1,00%	11,11 €	8,92 €	6,89 €	5,66 €	5,01 €	3,27 €	1,65 €	0,15 €
	1,25%	13,04 €	10,67 €	8,49 €	7,18 €	6,48 €	4,63 €	2,90 €	1,30 €
	1,50%	15,14 €	12,58 €	10,23 €	8,82 €	8,08 €	6,09 €	4,25 €	2,54 €
	1,75%	17,44 €	14,66 €	12,12 €	10,60 €	9,80 €	7,66 €	5,69 €	3,87 €
	2,00%	19,98 €	16,94 €	14,19 €	12,54 €	11,67 €	9,37 €	7,25 €	5,30 €
	2,20%	22,19 €	18,93 €	15,98 €	14,21 €	13,29 €	10,84 €	8,60 €	6,53 €
	2,50%	25,88 €	22,22 €	18,93 €	16,97 €	15,95 €	13,25 €	10,78 €	8,53 €
	2,75%	29,36 €	25,30 €	21,68 €	19,53 €	18,42 €	15,47 €	12,79 €	10,35 €
	3,00%	33,27 €	28,75 €	24,73 €	22,37 €	21,14 €	17,91 €	14,99 €	12,34 €
	3,25%	37,70 €	32,62 €	28,14 €	25,52 €	24,16 €	20,60 €	17,41 €	14,51 €

Table 10 – Sensitivity Analysis, in euros
Source: own calculations

The sensitivity analysis ran for both the growth rate and WACC factors, our discount rate, resulted on the alternative shares values mapped in the table above. The value of 0,15 euros is the lowest share price obtained. This considers a growth rate of 1%, under the one used in the final model, and a discount rate (WACC) of 8,50%, above the one used in the final model, representing a negative variation of 98,51.The highest value obtained was of 37,70 euros, which considers a growth rate of 3,25%, above the one used in the final model, and a discount rate of 7,00%, under the one used in the final model, representing a positive variation of 286%. These results translated how sensitive Manvia is to both internal and external factors.

7. CONCLUSION

The main objective of the work described in this thesis was to carry out an equity valuation of a non-listed company, Manvia.

All benchmarked valuation methods showed many limitations in executing Manvia's valuation. As Manvia is not a listed company nor has a clearly identifiable peer group, it was not possible to apply market prices in its valuation. This raised fundamental challenges, given that the valuation methods considered seek to evaluate the company's worth for its investors (factoring in forecasts and assumptions).

Still, we were able to pinpoint the Free Cash Flow to the Firm as the method better adjusted to the company's financial reports and Business Plan.

The results obtained from its application were an equity value of 7.107.286 euros and shares unit value of 14,21 euros. These are nevertheless acknowledged as quite restrictive as obtained through book values, which do not represent Manvia's real market value. To obtain the company's real value, it would be required to collect all the market values from its current and potential shareholders.

Nevertheless, the valuation carried out can still be leveraged in conjunction with the forecasts and assumptions used in the company's Business Plan. Doing so while considering the conjecture of uncertainty brought by the pandemic and war, supports the recognition of Manvia as an increasingly strong and stable company heading to become a reference in the industry in which it operates.

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Company Data

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Business Plan 2021 – 2026

9. APPENDICES

Appendix 01 – Manvia's Income Statement Forecast

	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Sales and services	20.301.547	25.086.748	27.091.136	30.886.592	32.396.065	34.737.268	38.135.145	42.216.160	45.570.349
Sales growth	-8,42%	23,57%	7,99%	14,01%	4,89%	7,23%	9,78%	10,70%	7,95%
Operating subsidies	3.694	13.092	128.825	51.100	0	0	0	0	0
Gains / losses in associated companies	321.507	175.156	217.765	12.054	0	0	0	0	0
Variation of production inventories	0	0	0	0	0	0	0	0	0
Own work capitalized	0	0	0	0	0	0	0	0	0
Cost of goods sold and materials consumed	(2.759.162)	(3.412.953)	(3.321.758)	(4.753.330)	(4.385.990)	(4.611.152)	(4.970.223)	(5.567.233)	(6.131.522)
External services and suppliers	(8.480.938)	(11.225.830)	(12.070.557)	(12.911.024)	(13.858.751)	(14.970.663)	(16.361.501)	(18.051.115)	(18.974.294)
Personnel Costs	(8.894.960)	(10.299.265)	(10.933.885)	(12.247.873)	(12.971.806)	(13.719.661)	(15.061.202)	(16.729.822)	(18.370.430)
Impairment of inventories	0	0	0	(55.797)	0	0	0	0	0
Impairment of receivables	(181)	(432)	(27)	(4.464)	0	0	0	0	0
Provisions	50.000	0	0	0	0	0	0	0	0
Impairment of not depreciable investments	0	0	0	0	0	0	0	0	0
Increases/decreases in fair value	0	0	0	0	0	0	0	0	0
Other income and profits	416.933	483.262	165.761	475.858	103.876	115.412	51.938	131.586	104.563
Other expenses and losses	0	0	0	0	0	0	0	0	0
EBITDA	**958.439**	**819.778**	**1.277.260**	**1.453.118**	**1.283.393**	**1.551.204**	**1.794.157**	**1.999.576**	**2.198.666**
% net sales	4,72%	3,27%	4,71%	4,70%	3,96%	4,47%	4,70%	4,74%	4,82%
Depreciation and amortization	(482.542)	(735.530)	(627.310)	(486.294)	(547.571)	(535.868)	(507.833)	(442.209)	(427.377)
Impairment of depreciable investments	0	0	0	0	0	0	0	0	0
EBIT	**475.898**	**84.247**	**649.951**	**966.824**	**735.822**	**1.015.336**	**1.286.324**	**1.557.367**	**1.771.289**
% net sales	2,34%	0,34%	2,40%	3,13%	2,27%	2,92%	3,37%	3,69%	3,89%
Interest and similar income	255	31	360	11.236	0	0	0	0	0
Interest and similar costs	(234.143)	(212.794)	(190.528)	(218.216)	(201.380)	(186.921)	(191.554)	(174.856)	(195.609)
Earnings before taxes	**242.009**	**(128.516)**	**459.783**	**759.844**	**534.442**	**828.416**	**1.094.770**	**1.382.511**	**1.575.680**
% net sales	1,19%	-0,51%	1,70%	2,46%	1,65%	2,38%	2,87%	3,27%	3,46%
Income tax	20.641	155.535	(92.568)	(98.064)	(125.176)	(173.967)	(229.902)	(290.327)	(330.893)
Net Income	**262.650**	**27.019**	**367.215**	**661.780**	**409.266**	**654.448**	**864.868**	**1.092.184**	**1.244.787**
% net sales	1,29%	0,11%	1,36%	2,14%	1,26%	1,88%	2,27%	2,59%	2,73%

Source: Manvia's Report and own calculations

Appendix 02 – Manvia's Balance Sheet Forecast

	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Assets									
Non-current Assets									
Tangible fixed assets	846.343,30	1.257.874,91	983.872,00	791.835,40	726.738,45	740.844,44	823.273,21	905.056,63	971.459,54
Goodwill	-	-	-	507.799,40	507.799,40	507.799,40	507.799,40	507.799,40	507.799,40
Intangible fixed assets	41.949,18	24.325,57	455,56	-	-	-	-	-	-
Investments – equity method	827.837,34	926.640,44	2.192.973,31	1.580.338,61	1.580.338,61	1.580.338,61	1.580.338,61	1.580.338,61	1.580.338,61
Other Investments	348.948,12	313.201,38	540.681,66	513.101,21	513.101,21	513.101,21	513.101,21	513.101,21	513.101,21
Clients	210.017,84	139.845,16	131.008,02	153.679,18	261.620,27	55.596,92	-	-	-
Other non-current debtors	881.000,00	-	-	-	-	-	-	-	-
Deferred taxes assets	18.190,33	125.860,80	149.092,74	12.943,17	-	-	-	-	-
	3.174.286,11	**2.787.748,26**	**3.998.083,29**	**3.559.696,97**	**3.589.597,94**	**3.397.680,58**	**3.424.512,43**	**3.506.295,85**	**3.572.698,76**
Current assets									
Inventories	194.301,30	127.568,98	285.397,06	502.628,31	685.377,89	749.421,68	956.514,29	1.049.301,52	1.245.824,66
Clients	6.827.802,75	9.993.808,61	10.606.414,04	10.571.417,40	10.608.139,93	10.641.192,18	11.259.773,35	10.429.363,52	11.085.501,99
Other current debtors	3.103.258,84	5.986.893,45	6.302.540,23	8.437.461,69	8.070.387,99	7.686.125,28	8.100.310,52	7.172.438,27	7.555.658,40
Deferrals	597.806,49	810.727,63	832.415,26	923.754,30	958.379,51	996.850,24	1.014.162,84	1.058.024,84	1.092.879,10
Cash and related	339.425,89	120.101,86	103.924,36	160.081,03	176.496,52	184.688,54	167.151,67	65.647,33	143.607,42
	11.062.595,27	**17.039.100,53**	**18.130.690,95**	**20.595.342,73**	**20.498.781,84**	**20.258.277,92**	**21.497.912,67**	**19.774.775,49**	**21.123.471,57**
Total Assets	**14.236.881,38**	**19.826.848,79**	**22.128.774,24**	**24.155.039,70**	**24.088.379,78**	**23.655.958,50**	**24.922.425,10**	**23.281.071,34**	**24.696.170,33**
Liabilities and equity									
Equity									
Common stock	500.000,00	500.000,00	500.000,00	500.000,00	500.000,00	500.000,00	500.000,00	500.000,00	500.000,00
Legal reserves	100.000,00	100.000,00	100.000,00	100.000,00	100.000,00	100.000,00	100.000,00	100.000,00	100.000,00
Other reserves	470.903,35	470.903,35	470.903,35	470.903,35	470.903,35	470.903,35	470.903,35	470.903,35	470.903,35
Retained profits	417.329,42	980.408,52	431.841,35	438.860,42	1.100.640,63	1.305.273,48	1.959.721,63	2.824.589,62	3.370.681,55
Adjustments / Other changes in equity	1.289.481,62	1.859.914,24	2.982.508,99	2.707.439,54	2.707.439,54	2.707.439,54	2.707.439,54	2.707.439,54	2.707.439,54
Net profit	262.650,30	27.018,50	367.215,05	661.780,21	409.265,71	654.448,15	864.867,99	1.092.183,87	1.244.787,02
Total Equity	**3.040.364,69**	**3.938.244,61**	**3.988.786,04**	**4.878.983,52**	**5.288.249,23**	**5.738.064,52**	**6.602.932,51**	**7.695.116,38**	**8.393.811,46**
Liabilities									
Non-current liabilities									
Provisions	469.657,78	353.524,26	388.138,90	432.354,39	432.354,39	432.354,39	432.354,39	432.354,39	432.354,39
Suppliers	-	60.064,26	-	1.875,00	-	-	-	-	-
Loans	1.219.474,53	1.258.670,40	2.858.011,76	2.291.438,62	2.459.316,37	2.444.968,47	2.593.888,87	2.306.551,46	2.111.877,23
	1.689.132,31	**1.672.258,92**	**3.246.150,66**	**2.725.668,01**	**2.891.670,76**	**2.877.322,86**	**3.026.243,26**	**2.738.905,85**	**2.544.231,62**
Current liabilities									
Suppliers	3.560.861,51	5.852.980,94	6.112.783,87	7.630.795,88	7.682.397,67	7.494.909,63	7.106.130,57	5.537.657,33	5.594.546,21
State and public sector	900.871,70	1.133.430,46	1.072.279,15	1.004.069,03	1.014.795,70	1.143.748,57	1.434.124,70	1.905.223,87	2.529.970,96
Loans	1.709.485,06	2.371.676,03	2.444.809,64	2.372.107,10	2.102.599,85	1.882.538,08	1.854.059,19	1.660.010,12	1.634.897,62
Other current creditors	3.241.332,53	4.610.143,82	4.110.002,78	5.057.399,67	4.691.900,51	4.179.550,23	4.593.735,47	3.526.682,38	3.850.945,58
Deferrals	94.833,58	248.114,01	1.153.962,10	486.016,49	416.766,07	339.824,61	305.199,40	217.475,40	147.766,90
	9.507.384,38	**14.216.345,26**	**14.893.837,54**	**16.550.388,17**	**15.908.459,79**	**15.040.571,12**	**15.293.249,33**	**12.847.049,10**	**13.758.127,26**
Total Liabilities	**11.196.516,69**	**15.888.604,18**	**18.139.988,20**	**19.276.056,18**	**18.800.130,55**	**17.917.893,98**	**18.319.492,59**	**15.585.954,96**	**16.302.358,88**
Total Liabilities and Equity	**14.236.881,38**	**19.826.848,79**	**22.128.774,24**	**24.155.039,70**	**24.088.379,78**	**23.655.958,50**	**24.922.425,10**	**23.281.071,34**	**24.696.170,34**

Source: Manvia's Report and own calculations

Appendix 03 - Country Default Spreads and Risk Premiums

Country	Moody's rating	*Adj. Default Spread*	*Country Risk Premium*	*Equity Risk Premium*	*Country Risk Premium*
Abu Dhabi	Aa2	0.42%	0.49%	4.73%	0.49%
Albania	B1	3.83%	4.45%	8.69%	4.45%
Algeria	NR	5.53%	6.43%	10.67%	6.43%
Andorra (Principality of)	Baa2	1.62%	1.88%	6.12%	1.88%
Angola	B3	5.53%	6.43%	10.67%	6.43%
Anguilla	NR	5.88%	6.83%	11.07%	6.83%
Antigua & Barbuda	NR	5.88%	6.83%	11.07%	6.83%
Argentina	Ca	10.21%	11.87%	16.11%	11.87%
Philippines	Baa2	1.62%	1.88%	6.12%	1.88%
(…)					
Poland	A2	0.72%	0.84%	5.08%	0.84%
Portugal	Baa2	1.62%	1.88%	6.12%	1.88%
Qatar	Aa3	0.51%	0.60%	4.84%	0.60%
Ras Al Khaimah (Emirate of)	A3	1.02%	1.19%	5.43%	1.19%
Reunion	NR	4.51%	5.25%	9.49%	5.25%
Romania	Baa3	1.87%	2.18%	6.42%	2.18%
Russia	Baa3	1.87%	2.18%	6.42%	2.18%
Rwanda	B2	4.68%	5.44%	9.68%	5.44%
Saint Lucia	NR	5.88%	6.83%	11.07%	6.83%
Saudi Arabia	A1	0.60%	0.70%	4.94%	0.70%
Senegal	Ba3	3.06%	3.56%	7.80%	3.56%
Serbia	Ba2	2.56%	2.97%	7.21%	2.97%
Sharjah	Baa3	1.87%	2.18%	6.42%	2.18%
Sierra Leone	NR	8.51%	9.89%	14.13%	9.89%
Singapore	Aaa	0.00%	0.00%	4.24%	0.00%
Slovakia	A2	0.72%	0.84%	5.08%	0.84%
Slovenia	A3	1.02%	1.19%	5.43%	1.19%
Solomon Islands	Caa1	6.38%	7.41%	11.65%	7.41%
Somalia	NR	10.21%	11.87%	16.11%	11.87%
South Africa	Ba2	2.56%	2.97%	7.21%	2.97%
South Korea	Aa2	0.42%	0.49%	4.73%	0.49%
Spain	Baa1	1.36%	1.58%	5.82%	1.58%
Sri Lanka	Caa2	7.66%	8.90%	13.14%	8.90%
(…)					

Source: https://pages.stern.nyu.edu/~adamodar/
Last updated: January 5, 2022

Appendix 04 - Country Default Spreads and Risk Premiums

Industry Name	*Number of firms*	*Average Unlevered Beta*	*Average Levered Beta*	*Average correlation with the market*	*Total Unlevered Beta*	*Total Levered Beta*
Business & Consumer Services	219	0,97	1,08	35,48%	2,74	3,03
Diversified	66	0,97	1,19	48,80%	1,99	2,43
Engineering/ Construction	153	0,84	1,05	37,76%	2,22	2,78

Source: https://pages.stern.nyu.edu/~adamodar/
Last updated: January 5, 2022