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Equity Valuation: CTT – Correios de Portugal, S.A.

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Master in Finance

Supervisor:
PhD Pedro Manuel de Sousa Leite Inácio, Assistant Professor, Iscte-Iul

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BUSINESS
SCHOOL

Finance Department

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Resumo

A avaliação de empresas sempre foi um tema de grande interesse para as próprias, stakeholders e especialistas da área. O objetivo do presente projeto de Mestrado em Finanças é avaliar os CTT - Correios de Portugal, S.A. (apenas CTT daqui em diante), uma empresa portuguesa cotada na Euronext Lisbon e uma das maiores do país.

Embora a sua principal operação, maioritariamente assente em serviços postais, tenha enfrentado dificuldades como a diminuição de receitas e volumes, a inovação através do e-commerce, o investimento em encomendas e principalmente os resultados do Banco CTT, têm impulsionado o grupo para um crescimento estável, mantendo a sua importância neste setor da economia portuguesa.

No âmbito do processo de avaliação, o objetivo deste trabalho é avaliar os CTT, nomeadamente se a sua ação se encontra sub ou sobrevalorizada e, consequentemente, emitir uma recomendação sobre a decisão a tomar relativamente à mesma. Para tal, optou-se por utilizar a abordagem dos fluxos de caixa descontados (através do método dos fluxos de caixa livres), que é posteriormente complementada por uma avaliação relativa. O preço da ação dos CTT foi calculado e submetido a uma análise de sensibilidade, com vista a compreender de melhor forma as suas possíveis variações.

Através da aplicação do primeiro método, o preço alvo por ação dos CTT a 31 de dezembro de 2020 foi estimado em 4,25€. Atendendo a que a ação fechou em 2,35€ a 31 de dezembro de 2020, conclui-se que esta se encontrava subavaliada, pelo que se recomenda a compra da mesma.

Palavras-Chave: CTT – Correios de Portugal, S.A.; Avaliação de Empresas; Discounted Cash Flow; Free Cash Flows to the Firm; Relative Valuation; Finanças Empresariais

Sistema de Classificação JEL: G32 – Value of Firms; O22 – Project Analysis

Abstract

Equity valuation has always been a subject of interest for companies, stakeholders and corporate finance specialists. The purpose of this Master in Finance project is to valuate CTT - Correios de Portugal, S.A. (from now on referred to as only CTT), a Portuguese company listed on Euronext Lisbon and one of the biggest in the country.

Although its main operation, which largely consists of postal services, has been facing difficulties in the form of revenue and volume decreases, the innovation through e-commerce, investment in parcels and specially CTT Bank and financial services, have been propelling CTT to a stable growth, maintaining its importance in this sector of the Portuguese economy.

As part of the valuation process, the end goal for this work is to assess if CTT's shares were under or overvalued and, consequently, issue a recommendation on the action to take regarding them. To do this, the method chosen was the discounted cash flow model, namely the firm valuation approach (free cash flows to the firm), which is later complemented by another approach, relative valuation. The share price of CTT was subsequently computed and subject to a sensitivity analysis in order to better understand its possible variations.

Through the application of the free cash flows to the firm methodology, CTT target price per share, as of 31st December 2020, was estimated to be of €4.25. Given that the share closed at €2.35 on 31st December 2020, it is concluded that it was undervalued, hence a buy recommendation is suggested.

Keywords: CTT – Correios de Portugal, S.A.; Company Valuation; Discounted Cash Flow; Free Cash Flows to the Firm; Relative Valuation; Corporate Finance

JEL Classification System: G32 – Value of Firms; O22 – Project Analysis

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Glossary of Acronyms

APT	Arbitrage Pricing Theory
APV	Adjusted Present Value
β	Beta
β_l	Beta Levered
β_u	Beta Unlevered
B2B	Business-to-Business
B2C	Business-to-Consumer
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
Cov	Covariance
D	Debt
DCF	Discounted Cash Flow
DDM	Dividend Discount Model
DPS	Dividends per share
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings Before Interest, Taxes, Depreciations and Amortizations
ECB	European Central Bank
EV	Enterprise Value
EV/EBIT	Enterprise Value-to-EBIT
EV/EBITDA	Enterprise Value-to-EBITDA
EV/NOPLAT	Enterprise Value-to-NOPPLAT
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to the Firm
g	Perpetuity growth rate
g_l	Short-term growth rate
g_s	Stable long-term growth rate
GDP	Gross Domestic Product
k_d	Cost of Debt
k_e	Cost of Equity
k_u	Unlevered Cost of Equity

NOPLAT	Net Operating Profit After Adjusted Tax
P/B	Price-to-Book ratio
PER	Price-to-Earnings ratio
PV_{BC}	Present Value of Bankruptcy Costs
PV_{ITS}	Present Value of Interest Tax Shield
P/S	Price-to-Sales ratio
R_f	Risk-Free rate
$(R_M - R_f)$	Market Risk Premium
RV	Residual Value
t	Effective tax rate
TV	Terminal Value
Var	Variance
V_U	Value of the firm unlevered
WACC	Weighted Average Cost of Capital
YoY	Year on Year
YTM	Yield to maturity

1. Introduction

The present work consists in the elaboration of an equity valuation report for CTT - Correios de Portugal, S.A. In order to help investors and interested economic agents, an equity valuation report is an analysis of a company's overall environment. It deeply examines all aspects of the company's operations, its strategic views and its financial performance with the goal of determining how much it is worth.

In this work, and to begin with, a literature review is performed in order to showcase the most used valuation approaches, their different methodologies, advantages and shortcuts and how relevant and accurate they are considered to be. In this phase, each valuation approach is thoroughly analysed with the aim of selecting the most appropriate one and, once selected, having the necessary basis to know how to proceed with the analysis.

Afterwards, a comprehensive overview of the company's history and its four main segments is performed. Moreover, an analysis of CTT's historical stock price variation and its organizational and shareholder structure is carried out, followed by a strategic plan analysis and an industry overview.

For this valuation, it is crucial to understand how each sector influences the overall performance of the company and how CTT ranks in each one compared to its competitors. This is a considerably important step given that it allows to have a better understanding of the recent evolution of the company as a whole but also of the segments it is composed by, which makes the assumptions and forecasts computed ahead more reliable.

Additionally, and being the core subject of this work, the chosen approach, the discounted cash flow model (more specifically the free cash flow to the firm methodology) is applied and, resourcing to the relevant data, the price target of CTT's share is computed.

To better evaluate the plausibility of the value obtained, a sensitivity analysis is performed, which allows to determine the range between which the target price of CTT's share may fluctuate if some crucial assumptions are modified. Moreover, a comparison of the value obtained and the evolution of CTT's share after the period of the analysis is carried out to assess the validity of the results obtained.

Lastly, the relative valuation approach is used in order to compare its results to those obtained in the main analysis.

In short, the purpose behind the selection of an equity valuation as a Master's project comes from the strong interest of the author in the area, accentuated by the growing relevancy of the subject in today's economy.

CTT was the chosen company since it was considered interesting to analyse how the recent economic downturn, largely due to the covid-19 pandemic, affected a company whose main business (postal services) had already been struggling in the previous years, and how it was able to find solutions to overcome these issues and keep growing.

This work is intended to allow any investor or interested party to draw conclusions about CTT's present and future development and to produce a recommendation regarding the target price of CTT's share on 31st December 2020.

2. Literature Review

In life, as in business, intelligent decision making is the best path to success. According to Damodaran (2006), in valuation, a prerequisite to achieve such decisions is knowing how much an asset is worth and what determines its value.

Although some assets are easier to value than others, since the uncertainty associated with the estimation of certain values and their details differs between assets, it is plausible to assume that the core principles for their valuation remain the same, whether they are financial or real (Damodaran, 2006). This is particularly useful since the decisions in question may have to do with different situations, varying from selecting investments for a portfolio to determining the appropriate price to pay or ask for in a takeover or simply to making investment and financing choices while running a business (Damodaran, 2006).

Company valuation has become increasingly more relevant over the years. Thereby, different views on its process are constantly being brought up, with some believing that it is a hard science with little to no room for human views or errors, and others believing analysts have a more active role in generating results (Damodaran, 2006).

Hereupon, it is important to note that the valuation process requires not only making considerations about financial elements and data analysis, but also about components of commercial, technical and environmental character. According to Koller et al. (2020), some of those considerations are related to having a thorough understanding of the industry dynamics in which the company operates, and with that making more rational and well-founded business decisions.

Nevertheless, it is through valuation approaches that these considerations enable the computation of a company's value and although there is an extensive spectrum of models available, they are some more commonly used.

2.1. Valuation Approaches

From the most simplistic to the most sophisticated models, valuation approaches differ in many ways. According to Damodaran (2006), using different models usually means that analysts yield different estimates of value, giving that the basic assumptions also differ. However, some of these models do have some characteristics in common and therefore can be broadly classified, in order to have a better understanding of where individual models fit in the overall scheme and to facilitate the interpretation of their results (Damodaran, 2006).

Therefore, Damodaran (2006) suggests that there are three main approaches to valuation. These are Discounted Cash Flow valuation, Relative Valuation and Contingent Claim valuation.

2.1.1. Discounted Cash Flow Valuation

The Discounted Cash Flow (DCF) models are, and have been in historical terms, the most reliable at measuring the value of an asset. Although it is only one of the three approaches to valuation, it is also the foundation on which the other two are built (Damodaran, 2012).

Damodaran (2012) considers that this approach relies on the present value rule, where the value of any asset is the present value of expected future cash flows on it, which in turn rely on the growth generated, the life of the asset and the associated risk. In this sense, the value of an asset can be computed as follows:

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

where:

n = Life of the asset

CF_t = Cash flow in period t

r = Discount rate reflecting the riskiness of the estimated cash flows

The cash flows will differ between different assets, in the case of valuating a real project, the most relevant for this work, the after-tax cash flows are considered. In addition, the discount rate is considered a function of the riskiness of the estimated cash flows, hence riskier assets have higher discount rates and safer assets have lower discount rates (Damodaran, 2012).

Company valuation is on the higher spectrum of the above risk ladder, given that there are expected cash flows with substantial uncertainty around the expectations (Damodaran, 2012). Due to this, Damodaran (2012) states that the value in question should be the present value of these expected cash flows at a discount rate that accounts for that uncertainty. As a result, the accuracy of the DCF models largely depends on the assumptions made (Koller et al., 2020).

Hereupon, there are several models within the DCF methodology. Ultimately, however, three main paths stand out, these are Firm Valuation (Free Cash Flows to the Firm), Equity Valuation (Dividend Discount Model and Free Cash Flows to Equity) and Adjusted Present Value.

2.1.1.1. Firm Valuation

The Firm Valuation model aims to value the company as a whole, including not only equity holders but the entirety of claimholders in the firm, such as bondholders and preferred stockholders (Damodaran, 2012).

In this model, the value of a firm is obtained through discounting the expected free cash flows to the firm (FCFF) - which are the residual cash flows after meeting all operating expenses, reinvestment needs and taxes, but prior to any payments to either debt or equity holders - at the weighted average cost of capital (WACC) (Damodaran, 2012). As a result, the value of the firm can be computed as follows:

$$Value\ of\ firm\ = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1+WACC)^t} \tag{2}$$

where:

$FCFF_t$ = Free cash flow to the firm in year t

WACC = Weighted average cost of capital

However, it is important to notice that a company only estimates its free cash flow for a certain explicit period, until, and if, it reaches a steady state (year n). According to Damodaran (2012), beyond such period FCFF starts to grow at a stable growth rate (g_n) and can be measured as a perpetuity, the firm's Terminal Value (TV), which is computed as follows:

$$Terminal\ Value\ = \frac{FCFF_{n+1}}{(WACC - g_n)} \tag{3}$$

where:

$FCFF_{n+1} = FCFF_n \times (1+g_n)$

g_n = Stable growth rate

Moreover, as it happens with most forecasted data, it is important that the stable growth rate (g_n) meets certain criteria to be considered acceptable. Among others, the most important criteria have to do with having the certainty that the company will not grow at a higher rate than the economy where it is operating, which translates to an obligation for the stable growth rate (g_n) to be lower than or equal to the economy's growth rate.

Therefore, the value of the firm is given as follows:

$$Value\ of\ the\ firm\ = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1+WACC)^t} + \frac{TV_n}{(1+WACC)^n} \tag{4}$$

Henceforth, to be able to compute the value above, it is necessary to estimate a set of components which will be subsequently detailed.

Free Cash Flows to the Firm (FCFF)

The first step into this model is to measure the free cash flows to the firm (FCFF), which according to Damodaran (2012), can be done in two ways. The first option is to add up the cash flow from all claim holders, starting with the free cash flows to equity, then the cash flow to lenders (composed of principal repayments, interest expenses and new debt issues) and then cash flow to preferred stockholders (preferred dividends), resulting in the following:

$$\begin{aligned} FCFF = {} & Free\ cash\ flows\ to\ equity \\ & + Interest\ expenses \times (1 - Tax\ rate) \\ & + Pincipal\ repayments - new\ debt\ issues \\ & + Preferred\ dividends \end{aligned} \tag{5}$$

Alternatively, it is also possible to measure the free cash flows to the firm by estimating the cash flows prior to any claim, as follows:

$$\begin{aligned} FCFF = {} & EBIT * (1 - Tax\ Rate) + Depreciation - Capital\ expenditure \\ & - \Delta\ Working\ Capital \end{aligned} \tag{6}$$

where:

EBIT = Earnings before interest and taxes

Finally, it is important to address that the free cash flows to the firm do not include any of the tax benefits due to interest payments, since those are already accounted for in the weighted average cost of capital (WACC) (Damodaran, 2012).

Weighted Average Cost of Capital (WACC)

While valuating a company, one crucial variable that must be taken into consideration is the company's capital structure. Usually, said structure is composed of debt and equity, through which the company finances its operations.

To acquire either debt or equity, a company typically resorts to financial entities or investors, who provide capital upon the expectation to receive a future compensation. This compensation can be computed, in the company's perspective, as a weighted average of the cost of debt (k_d) and the cost of equity (k_e) relative to their weight on the total capital structure. In addition, in said compensation, it is also considered the tax shield effect from having debt (since the higher the debt the higher the tax shield).

This approach is the Weighted Average Cost of Capital (WACC) and estimating it is a crucial step when valuing a company (Vernimmen et al., 2018).

Its formula is the following:

$$WACC = k_e * \frac{E}{E+D} + k_d * (1-t) * \frac{D}{E+D} \quad (7)$$

where:

k_e = Cost of equity

$k_d \times (1 - t)$ = After- tax cost of debt

t = Company's effective tax rate

E = Market value of equity

D = Market value of debt

Although applying the WACC might be an intuitive and relatively straightforward process, Damodaran (2007) alerts to the high sensitivity of the FCFF Model, seeing that small changes in the WACC can cause major differences in a company's value. Furthermore, Luehrman (1997) also notes that discounting all future cash flows at the WACC is limited to companies whose capital structure remains constant at a target ratio of debt to equity.

Even though these may be regarded as drawbacks of the approach, the WACC is still considered as relevant due to its historic reliability (Koller et al., 2020), and consequently will be used in CTT's valuation.

Knowing the considerable differences between equity holders (who own the company and are entitled to future profits) and debt holders (who earn interest payments on their loans, and, at maturity, the amount lent), it is expected that the approaches to estimate equity and debt values as well as both cost of debt (k_d) and cost of equity (k_e), also differ.

Cost of Equity (k_e):

The cost of equity, also described as the rate of return required by shareholders, is obtained through the estimation of the expected return on the market portfolio considering the risk of the company in question.

To compute it, analysts usually resort to an asset pricing model and, as mentioned by Koller et al. (2020), models like the Arbitrage Pricing Theory (APT), the Fama-French three-factor model and the Capital Asset Pricing Model (CAPM) are the most viable, differentiating primarily on how to estimate the effects of compensated risk.

As it is the most commonly used, the CAPM will be the one chosen, and its formula is the following:

$$k_e = R_f + \beta(R_M - R_f) \quad (8)$$

where:

R_f = Risk-free rate

β = Beta

$R_M - R_f$ = Market risk premium

Risk-free rate (R_f): In finance, most risk and return models begin with a risk-free asset and use its expected return as the risk-free rate (Damodaran, 2012). The risk-free rate accounts for the compensation regarding the time value of money of having made an investment over time. Given the certainty of the expected return, there can be no default risk, implying that said security has to be issued by a government. Usually, the risk-free rate is estimated considering a long-term sovereign debt instrument which, according to Koller et al. (2020), is commonly a 10-year bond denominated in the same currency as the company's cash flows, to be consistent with the effects of inflation on both the discount rate and the cash flows. Nevertheless, as Damodaran (2012) refers, it is important to note that not all governments are default free, so it can be especially difficult to estimate a risk-free rate in specific currencies where there is government or sovereign default risk.

Market risk premium ($R_M - R_f$): Damodaran (2012) defines the market risk premium as the excess return of the market compared to the risk-free government bond's return. In essence, it measures the extra return demanded by investors to relocate their money from a riskless investment to an average-risk investment (Damodaran, 2012). In addition, the same author also highlights the particularities of an analysis to its movements since there is not a single best way to estimate it. According to Damodaran (2012), in the CAPM there are three methods to estimate the market risk premium: surveying large investors about their expectations for the future; obtaining, through historical data, the premiums earned over a past period; and extracting from the current market data the implied premium. Seeing that the overall market is a vast concept to be accurately consider, the most used method to estimate the market risk premium takes into consideration the market where a certain company operates and proceeds to estimate a historical average of the excess return for said market.

Beta (β): Koller et al. (2020) refers that it is through Beta (β) that CAPM adjusts for a company's market risk, since it measures the way the stock price of said company reacts to movements in the market. There are three approaches for estimating it, the first is to estimate the betas from fundamentals, the second is to use historical data on market prices and the third is to use accounting data (Koller et al., 2020). Due to numerous constraints associated with the estimation of the beta, the first two are more commonly used.

Using fundamentals, the premise is to start by considering the average beta of the industry where the company is incorporated, given that the operating risk should be relatively the same for all. Damodaran (2012) then notes that apart from the operating risks (which don't consider debt) there are also financial risks (where debt is considered), which highlights the relevance of leverage when estimating the beta. As a result of this, the author distinguishes the beta as Levered (β_l) and Unlevered (β_u). Therefore, by using the average beta of the industry and its capital structure, it is possible to estimate the industry's unlevered beta (β_u), which in turn can be used, jointly with a specific company's capital structure, to estimate that company's levered beta (β_l), as follows (assuming the beta of Debt is zero):

$$\beta_l = \beta_u * (1 + \frac{D}{E}) \tag{9}$$

where:

β_L = Levered beta for equity in the firm

βu = = Unlevered beta of the firm (beta of the firm without any debt)

D/E = Debt-to-equity ratio (in market value)

Alternatively, using historical data on market prices, the most commonly used method by analysts, the market model is applied to estimate the company's beta. In this model, a linear regression is used where the stock's return is regressed against the market's return, as follows:

$$R_j = \alpha + \beta R_m + \varepsilon \tag{10}$$

where:

α = Intercept from the regression

β = Slope of the regression = $\frac{Cov\ (R_j, R_m)}{Var\ (R_m)}$

The slope of the regression corresponds to the beta of the company, so the greater the beta, the bigger the risk of investing. Lastly, when the beta is greater than 1, the investment in that company is riskier than the market average, and the opposite for when it is less than 1.

After-tax Cost of Debt ($k_d \times (1 - t)$):

Damodaran (2006) considers the cost of debt as a measure of the current cost the firm as to bear for borrowing funds in order to finance its assets. Broadly, it is a function of the default risk perceived by lenders for a particular company.

Therefore, the after-tax cost of debt used in the computation of the WACC can then be achieved through the yield-to-maturity (YTM) or through debt ratings. In companies where it can be applied, those who are publicly traded, the cost of debt can be estimated as a weighted average using the company's after-tax yield-to-maturity on all its long-term debt. However,

for companies whose debt is not traded or for simplification purposes, Damodaran (2001) suggests the use of the company's debt rating, through the interest coverage ratio, to estimate the yield to maturity, as follows:

$$Interest\ Coverage\ Ratio^{1} = \frac{EBIT}{Interest\ Expenses} \tag{11}$$

Lastly, it is important to note that the interest tax shield is only included in the WACC through the use of the after-tax cost of debt $[K_d * (1 - t)]$, given that the free cash flows do not include it (Koller et al., 2020), as previously mentioned.

Market value of Debt and Equity:

In a company, the computation of debt and equity values can be carried out in a book value or in a market value perspective. However, in the WACC methodology, the market values are the ones considered.

According to Damodaran (2006), the market value of equity is usually the number of shares outstanding multiplied by the current stock price. The author also refers that the market value of debt can be obtained through converting the book value of debt into the market value of debt by considering all debt on the books as a zero-coupon bond.

2.1.1.2. Equity Valuation

This way of approaching the DCF valuation aims to value just the equity stake in a business, by considering that its present value is the value of just the equity claims on the company. This model consists of the following two different approaches:

Dividend Discount Model

The dividend Discount Model (DDM) is a special case of equity valuation, it uses the basic principle of time value of money and portrays the value of equity as the present value of the expected future dividends it will pay to its shareholders (Damodaran, 2012).

According to Damodaran (2007), when buying a stock one can expect dividends and the expected price at the end of the holding period. Considering that the expected price is achieved through future dividends, the value of a stock can be written as the present value of dividends in perpetuity, as follows:

$$Value\ per\ share\ of\ stock = \sum_{t=1}^{t=\infty} \frac{E(DPS_t)}{(1 + k_e)^t} \tag{12}$$

[1] In annex A it is possible to consult the table Damodaran (2021b) considers, which relates the company's interest coverage ratio to its rating and typical default spread.

where:

E (DPS_t) = Expected dividends per share in period t

k_e = Cost of equity

Bearing in mind the underlying assumption above, it is possible to say that there are several versions of the dividend discount model. However, the Gordon Growth Model is the simplest and most straight-forward, so it is the one which will be analysed.

This model, proposed by Gordon (1959), relates the value of a stock to three variables: its expected dividends in the next time period, the cost of equity and the dividends' expected growth rate. Although this model is a simple and useful approach to valuing equity, it is only applicable to companies who pay dividends, and, within those, it is limited to companies that are growing at a stable rate. The formula for this model is as follows:

$$Value\ of\ stock\ = \frac{DPS_1}{K_e - g} \tag{13}$$

where:

g = Growth rate in dividends in perpetuity

DPS_1 = Dividends per share in period 1

Furthermore, this model is restricted by some assumptions, especially by the fact that the growth rate in the company's dividends is expected to last forever, which makes it difficult for it to be reliably used most of the time. One way to get around this is to apply a slight variation to the DDM with the H Model for Valuing Growth (Fuller & Hsia, 1984). In this variation the growth rate in the short term (g_s) is not constant but declines linearly over time (assumed to last 2H periods) to reach the stable long-term growth rate (g_l). Therefore, the value of expected dividends can be written as:

$$P_0 = \frac{DPS_0 \times (1 + g_{l)}}{(k_e - g_l)} + \frac{DPS_0 \times H \times (g_s - g_l)}{(k_e - g_l)} \tag{14}$$

where:

H = amounts to half of the total number of years of high-growth period

Like the one above, there are numerous models that adapt to specific situations and different growth rates, however, since it is not viable to analyse all of them, this approach will not be considered.

Free Cash Flows to Equity

This model, as Damodaran (2007) refers, consists in accounting for the residual cash flows available to equity holders after meeting the nonequity investors claims (such as preferred

dividends, interest and debt payments), all expenses, tax obligations and after enough of these cash flows have been reinvested in order to sustain their forecasted growth. Consequently, the Free Cash Flows to Equity (FCFE) can be estimated as follows:

$$\begin{aligned} &Free\ Cash\ Flows\ to\ Equity \\ &= Net\ Income - (Capital\ expenditures - Depreciation) \\ &- (Change\ in\ noncash\ working\ capital) \\ &+ (New\ debt\ incurred - Debt\ repayment) \end{aligned} \tag{15}$$

Hereupon, by summing the FCFE discounted at the cost of equity (k_e) and subsequently adding them to the terminal value of equity (TV_n), it will be yielded the estimated equity value. The equity value formula is the following:

$$Equity\ Value = \sum_{t=1}^{n} \frac{FCFE_t}{(1+k_e)^t} + \frac{TV_n}{(1+k_e)^n} \tag{16}$$

where:

$FCFE_t$ = Free cash flow to equity in year t

k_e = Cost of equity

Note that the terminal value for equity is usually computed by using the stable growth rate model (Damodaran, 2006), as follows:

$$Terminal\ Value\ of\ Equity = \frac{FCFE_{n+1}}{k_e - g_n} \tag{17}$$

where:

g_n = Stable growth rate

2.1.1.3. Adjusted Present Value

The Adjusted Present Value (APV), introduced by Myers (1974), is an approach where an investor is able to understand in a clearer way the benefits of having debt, namely the tax shield effect resulting from tax deductions of interest payments. As stated above, Luehrman (1997) points out the shortcomings of the DCF methodology when a company does not have a constant capital structure. Damodaran (2007) also states that capturing the tax effects of having debt on the discount rate (WACC) may not be the most accurate way for those types of companies. Therefore, and to face this, the APV approach determines the enterprise value by discounting FCFF at the unlevered cost of equity (k_u), which is lower than the cost of equity (k_e) of a company with debt, achieving then the value of the firm unlevered (V_U).

Only after that, separately, the present value of interest tax shield and the bankruptcy costs are computed. The Enterprise Value formula is the following:

$$\begin{aligned} Enterprise\ Value \\ &= Value\ of\ the\ Firm\ Unlevered \\ &+ Present\ Value\ of\ Interest\ Tax\ Shields \\ &- Expected\ Bankruptcy\ Costs \end{aligned} \tag{18}$$

The formula for the value of the firm unlevered (V_U) is:

$$V_U = \frac{FCFF_1}{(1+k_U)^1} + \frac{FCFF_1}{(1+k_U)^2} + (\dots) + \frac{FCFF_1 + RV_N}{(1+k_U)^N} \tag{19}$$

where:

RV_N = Residual value of the company in year N

Since using debt can be an advantage due to the fact that interest rates are tax deductible, Myers (1974) puts forward the following formula to estimate the present value of interest tax shield (PV_{ITS}):

$$PV_{ITS} = \sum_{t=1}^{n} \frac{Debt \times k_d \times t}{(1+k_d)^t} \tag{20}$$

Lastly, having any given level of debt reflects on the company's default risk and consequently on its bankruptcy costs, which are computed, as Damodaran (2006) suggests, as follows:

$$Expected\ Bankruptcy\ Costs = Probability\ of\ Bankruptcy \times PV_{BC} \tag{21}$$

where:

PV_{BC} = Present value of bankruptcy costs

Due to the significant intricacy in estimating the probability of bankruptcy and the present value of bankruptcy costs, this approach will not be used.

2.1.2. Relative Valuation

Relative Valuation is an approach that uses multiples to form a relation between the market value of a company and a key statistic that relates to said value. In order to be credible, said statistic, which normally is a ratio, must be logically related to the market value in question. In addition, for Damodaran (2012), there are two fundamental components in relative valuation.

Firstly, prices must be standardized (usually by converting them into multiples of earnings) in order to be able to value assets on a relative basis. Secondly, there must be an

identification of a specific company that is similar to the one being valued or, more commonly, a peer group. This group is usually composed by a set of comparable companies that usually operate in the same industry and tend to have similar expectations regarding earnings growth and the cost of capital as the company in question (Koller et al., 2005).

Due to this, and to achieve a more accurate result, sometimes there is a necessity to filter the data, since some values may be out of the reasonable range (outliers), and ultimately compute an average considering the results of the different multiples used in order to reach the value of the company.

Often, the most used multiples are those based on the enterprise value of a company, like the Enterprise Value-to-EBITDA (EV/EBITDA), the Enterprise Value-to-EBIT (EV/EBIT) and the Enterprise Value to Net Operating Profit After Adjusted Tax (EV/NOPLAT). However, not all multiples are based on cash flow drivers or earnings.

Therefore, one of the most used multiples by analysts is the Price-to-Earnings ratio (P/E), which is popular amongst stock traders due to the importance given to earnings per share as a value driver. Others, like the Price-to-Sales (P/S), that measures value relative to sales, and the Price-to-Book ratio (P/B), commonly used as a benchmark to compare the accounting book value of a company's assets to the market value, are also an option. These three multiples are obtained in the following manner:

P/E:

$$P/E = \frac{Market\ value\ per\ share}{Earnings\ per\ share} \tag{22}$$

P/S:

$$P/S = \frac{Market\ value\ per\ share}{Sales\ per\ share} \tag{23}$$

P/B:

$$P/B = \frac{Market\ value\ per\ share}{Book\ value\ per\ share} \tag{24}$$

Nevertheless, there are some criticisms pointed at the use of multiples. Its simplistic nature, short term bias (for being based on historic or short term forecasted data), its static approach (capturing the company where it was at a given time but ignoring its dynamics and ongoing evolution) and the fact that it can only be used for mature and stable companies, make for some of the limitations present in the approach.

Although these limitations exist, the use of multiples is still a common practice since it measures as a complement to assess the results provided by the DCF model and relies on key statistics that are relevant to analysts when making investment decisions.

2.1.3. Contingent Claim Valuation

Although option pricing models have been mostly used to value traded options, recent years have seen these models extend their reach into more traditional valuation (Damodaran, 2012).

A contingent claim is a claim that pays off only under certain circumstances. Therefore, in this approach, an asset can be valued as an option if the payoffs are a function of the value of an underlying asset. If an asset gains value when the value of the underlying asset is less than a defined level, it can be valued as a put option. If when the value of the underlying asset surpasses a defined level the asset is worth the difference, it can be valued as a call option (Damodaran, 2012).

Vernimmen et al. (2018) states that contingent claim valuation is adequate for companies with high levels of uncertainty and investment flexibility.

According to Damodaran (2020), there are two main models in this approach, the Black-Scholes option pricing model and the binomial option pricing model.

Due to the limitations of using option pricing models such as this one, namely valuing long-term options on nontraded assets, this approach is still less used by analysts and consequently will not be considered to value CTT.

3. Methodology

Given that CTT - Correios de Portugal, S.A. is one of the biggest Portuguese companies and its capital structure is equally as large and constant, the approaches chosen to perform this valuation are the Discounted Cash Flow valuation, more specifically the Firm Valuation model (Free Cash Flow to the Firm) and Relative Valuation. Therefore, this valuation will be divided into three segments:

Company's presentation and financial analysis

To begin with, a brief overview of the company and its historical record in the stock market will be performed. This will be done considering the industry and the macroeconomic context in which the company is inserted. Key indicators like the company's recent financial performance, its business segments and its overall strategy will also be addressed in the analysis.

Discounted Cash Flow valuation (Firm Valuation - FCFF)

In the first of the chosen approaches, it is firstly necessary to estimate the Free Cash Flows to the Firm, which involves establishing an explicit period to forecast. Usually, most analysts choose a period between 3 to 10 years, but there is no preconceived rule. Therefore, the explicit period chosen is a 5-year period from 2021 to 2025. This will entail the elaboration of forecasts, taking into consideration the historic evolution of the company, in order to be more accurate. To do this, some assumptions will be formulated, most of them related to the company's operational activity, tax obligations, working capital, CAPEX and the WACC. Some of these assumptions will be made recurring to CTT's consolidated financial statements as well as public data from Damodaran's website and other sources.

After applying the chosen approach, the value of CTT's stock price on 31 December 2020 will be obtained, which is ultimately the main purpose of this work. To finalize the approach, a sensitivity analysis to different valuation variables will be held in order to understand how they influence CTT's share price.

Relative Valuation

Lastly, and although Relative Valuation is on its own a very solid and commonly used valuation approach, its aim here will be to compare its results to the ones obtained in the Firm Valuation (FCFF) model. The first step will be to identify a peer-group where the company can be inserted, typically composed by companies in the same industry, and then proceed with the multiples analysis. Within the several multiples mentioned above (see chapter 2.1.2.), the

ones chosen to compute CTT's share price target are the Price-to-Earnings ratio (P/E) and the Enterprise Value-to-EBITDA (EV/EBITDA).

4. CTT - Correios de Portugal, S.A.

4.1. Overview of the company

CTT is a Portuguese commercial group that operates as the national postal service in Portugal. The group is constituted by several subsidiaries operating in banking, e-commerce and diverse postal services (CTT, 2021).

The company was originally founded on November 6, 1520 as the Public Post Office (Correio Público in Portuguese) by the Portuguese king D. Manuel I. In the midst of the Portuguese renaissance, with constant advancements in naval exploration and engineering, different social behaviours and interactions required the creation of a public postal service. This allowed all citizens to better communicate among them but was mostly introduced to facilitate the communication with the outside world, especially with the countries that are now former Portuguese colonies (Jornal de Negócios, 2014).

In 1911, it received financial and administrative autonomy from the Portuguese state and became the General Administration of Posts, Telegraphs and Telephones (Administração-Geral dos Correios, Telégrafos e Telefones in Portuguese), originating the CTT designation that it is still known as today (Jornal de Negócios, 2014).

In 1953, the company adopted its most iconic logo, it showed an ancient postman riding a horse while carrying a bag of letters and announcing its arrival with a bugle. The logo has later been redesigned five times, with the latest change being made in March 2020.

After that, some structural changes occurred within the company, being that in 1969 CTT became a state company and later, in 1992, the year in which the company separated itself from the telecommunications service, it became a public limited company with all its shares owned by the Portuguese government. In that same year the name CTT - Correios de Portugal, S.A. was adopted, and it stands unchanged until this day (Jornal de Negócios, 2014).

Following the repercussions of the 2008 financial crisis, on the 5th of December 2013, the Portuguese government started the process of privatizing CTT in order to raise the necessary funds to comply with the European Union requirements for its bailout. Consequently, and through an IPO, 70% of CTT's shares were sold to private investors with the remaining 30% following on the 5th of September 2014, when the company became entirely private. CTT's shares are, since then, listed on Euronext Lisbon (CTT, 2013).

In November 2015 the group had its most recent significant change by opening the CTT Bank. The bank started by being exclusive to CTT collaborators but opened up to the general

public in March 2016, offering financial products and services with a lower price, targeting the middle and lower classes of the Portuguese society (CTT, 2021).

4.2. Business Segments and Recent Performance

CTT group includes, besides the parent company, the following subsidiaries (CTT, 2021):

CTT Expresso - Serviços Postais e Logística, S.A.: The CTT company specialized in courier services, urgent mail and merchandise. After the incorporation, on 20th December 2019, of Tourline Express Mensajería, SLU, a branch in Spain was opened.

Payshop Portugal, S.A.: Is a company that enables the payment of several services and utilities through a national network of more than 4400 agents, including business outlets as stationery stores, tobacco shops, kiosks, supermarkets and many others.

CTT Contacto, S.A.: Mainly focused on services associated with the distribution of advertising mail.

CTT Soluções Empresariais, S.A.: Created on 9th October 2020, it works in the area of business consulting services and supports the management and administration of companies

Correio Expresso de Moçambique, S.A. ("CORRE"): CTT group owns 50% of the main Mozambican postal service company.

Banco CTT, S.A.: With is head branch activity being opened on 27th November 2015 an CTT Retail Network being opened on 18 March 2016 in more than 50 post offices, it provides all times of baking services to the general public.

Inovation Fund TechTree: In December 2020, CTT, CTT Expresso, CTT Contacto and CTT Soluções Empresariais subscribed, in equal parts, units of participation of the investment and innovation fund TechTree.

321 Crédito – Instituição Financeira de Crédito, S.A.: Acquired by the CTT group on 2 May 2019.

Therefore, the company's business[2], is divided in four segments (CTT, 2021):

Mail: This segment includes the business of postal services and business solutions, it is composed by CTT, S.A., CTT Contacto, S.A. e CTT Soluções Empresariais, S.A.;

Express & Parcels: This segment is operated by CTT Expresso - Serviços Postais e Logística, S.A. in Portugal, its respective branch in Spain and Correio Expresso de Moçambique, S.A. in Mozambique;

[2] CTT's organizational structure can be consulted in annex B.

CTT Bank: Its mission is to provide simple and competitive financial products, an excellent service and establish relationships of trust and innovation;

Financial Services: This segment operates through Payshop Portugal, S.A. and all other financial services provided by CTT, S.A.

4.2.1. Mail

Allied with the growing tendency of digitalization, the covid-19 pandemic accelerated the downward trend in mail volumes.

In 2020, mail revenues were of €426.2m, representing a decline of €51.5m (-10.8%) compared to 2019. This negative variation was mainly due to the decline of €47.5m (-11.7%) in the revenues of transactional mail and the decline of €4.6m (-19.9%) in advertising mail. Although negative, these values were slightly mitigated by the revenue growth of €5.6m (54.8%) in business solutions, as shown in the table below (CTT, 2021):

Table 4.1 - Mail Revenue (Million €)

	2019	**2020**	**Δ%***
Transactional mail	406.4	358.9	-11.7%
Advertising mail	23.0	18.4	-19.9%
Editorial mail	14.5	12.8	-11.8%
Business Solutions	10.3	15.9	54.8%
USO Parcels	6.5	7.4	13.6%
Philately & other	10.7	9.6	-10.3%
Central Structure	6.3	3.2	-49.6%
Revenues	**477.7**	**426.2**	**-10.8%**

Source: CTT, 2021

* The variations shown may not correspond exactly to the values in the table due to rounding.

However, it is important to address that, if the effect of volumes related to the elections of September 2019 were excluded, the revenues decrease for the year would have been €43.0m. This is an important fact since elections considerably skew, in a positive way, the volumes of mail compared to years with no elections (CTT, 2021).

Therefore, in terms of volumes, in 2020, the mail business had the following results:

Table 4.2 - Mail Volumes (Million items)

	2019	**2020**	**Δ%**
Addressed mail	**619.0**	**516.9**	**-16.5%**

Transactional mail	536.0	447.2	-16.6%
Advertising mail	48.2	39.7	-17.6%
Editorial mail	34.8	30.0	-13.7%
Unaddressed mail	**521.4**	**412.3**	**-20.9%**

Source: CTT, 2021

Transactional mail volumes decreased by 16.6% due to reductions in all products. This was largely due to the ongoing pandemic which has negatively impacted international mail volumes, with a decline in both international outbound mail (-28.1%) and in international inbound mail (-20.7%) (CTT, 2021).

The advertising mail business also suffered the effects of the pandemic since the crisis led to the suspension of many mailing campaigns, at the expense of digital methods, leading to a decrease of 17.6%. All these factors, jointly with a 13.7% decrease in editorial mail, led to and overall decrease of 16.5% in addressed mail. The other component, unaddressed mail, saw its volumes get an even bigger decrease of 20.9% (CTT, 2021).

4.2.2. Express & Parcels

Since this segment is geographically divided, its volumes and revenues should also be analysed by region. Starting with the volume distribution by region, the results are as follows:

Table 4.3 - Express & Parcels volumes by region (Million items)

	2019	**2020**	**Δ%***
Portugal	22.0	28.4	29.2%
Spain	15.8	24.9	57.7%
Mozambique	0.06	0.04	-28.0%
Total	**37.86**	**53.34**	**41.0%**

Source: CTT, 2021

* The variations shown may not correspond exactly to the values in the table due to rounding.

Portugal

In 2020, revenues in Portugal were of €118m, a 20.2% increase compared to 2019. This impressive positive performance, especially in the midst of a pandemic, resulted mostly from the growth of the CEP (Courier, Express and Parcels) business, which recorded revenues of €96.5m (+28.6%). In addition to the revenues, CEP volumes also increased by 35.7% in comparison to 2019, totalling 25.9 million items. The strong boost of e-commerce, with a growth in the sports, leisure, food, culture and education sectors and most of all consumer electronics, heavily contributed to this positive result (CTT, 2021).

However, the restrictions resulting from the covid-19 pandemic did affect other parts of the business, such as the B2B volumes, which although partly offset by the strong growth in the e-commerce activity (B2C), had a significant reduction (CTT, 2021).

Lastly, the relatively recent Dott marketplace, launched in May 2019 in partnership with Sonae, portrays the real effect of this recent reality, evidencing an acceleration and considerable growth of digitalization and e-commerce. At the end of December 2020, the platform had registered 1,394 vendors and 200,000 users with more than 3 million products available for sale (CTT, 2021).

Spain

In 2020, revenues in Spain were of €72.3m, which represented a 39.6% increased comparing to 2019. This result is mainly due to the acquisition of new customers in the third quarter of 2020 and also the growth of e-commerce in the country (CTT, 2021).

Mozambique

In 2020, revenues in Mozambique were of €2.7m, representing a 10.6% increased relatively to 2019. The CEP (Courier, Express and Parcels) business was the main contributor for this growth (CTT, 2021).

The total Express & Parcels revenues amounted to €193m in 2020, €40.6m (+26.6%) more than in 2019, as follows:

Table 4.4 - Express & Parcels Revenue by region (Million €)

	2019	**2020**	**Δ%***
Portugal	98.2	118.0	20.2%
Parcels	75.0	96.5	28.6%
Cargo	12.4	11.4	-8.2%
Banking network	6.7	6.6	-1.4%
Logistics	3.2	2.4	-23.5%
Other	0.9	1.1	18.5%
Spain	51.8	72.3	39.6%
Mozambique	2.4	2.7	10.6%
Revenues	**152.4**	**193.0**	**26.6%**

Source: CTT, 2021

* The variations shown may not correspond exactly to the values in the table due to rounding.

4.2.3. CTT Bank

In 2020, CTT Bank reached, for the first time ever, a consolidated net profit. With around 517,000 clients with open bank accounts, 56,000 of which opened during 2020 (9,3% increased), CTT Bank revenues reached €82.1m, a 30.5% increase that amounted to more € 19.2m in revenues compared to the previous year. However, it is important to note that this result includes the €12.9m increase from 321 Crédito, compared to 2019, as seen in table 4.5. A significant increase in accounts and debit cards (+607.0%), customer transactions (+14.6%) and mortgage loans (+64.4%), allied with the introduction, in April of 2020, of debit card commissions, also resulted in a growth of gross commissions of €4.8m, 52.9% more than in 2019. In 2020, the overall CTT Bank revenues were as follows (CTT, 2021):

Table 4.5 - CTT Bank Revenues

	2019	**2020**	**Δ%***
Net interest income	12.7	17.3	35.6%
Interest income	13.6	18.2	33.6%
Interest expense	(0.9)	(0.9)	-4.5%
Fees / commissions income	8.9	13.7	52.9%
Own products	5.5	8.8	59.1%
Third-party products	3.4	4.9	42.8%
Payments & other	20.3	17.2	-14.6%
321 Crédito	21.0	33.9	61.2%
Net operating revenues	**62.9**	**82.1**	**30.5%**

Source: CTT, 2021

* The variations shown may not correspond exactly to the values in the table due to rounding.

Due to the measures used to contain the pandemic, many dealerships were temporarily closed, which affected CTT Bank's businesses. However, and even with these constraints, the volume of auto loan production was of €193.8m, a 35.4% increased relative to 2019 (CTT, 2021).

The net mortgage loan portfolio was of €524.6m, showing a strong 29.5% increase compared to 2019. On the other hand, the mortgage loan production suffered a €29.4m decreased, which represents a value 15.5% smaller compared to 2019 (CTT, 2021).

Finally, and even in the midst of an unprecedented global pandemic, CTT Bank business performance allowed for a 31.6% growth in customer deposits compared to the previous year, amounting to €1,689.1m (CTT, 2021).

4.2.4. Financial Services

In 2020, Financial Services & Retail revenues amounted to €44.0m, which represented a 7.1% decrease relative to 2019 where the revenues were €3.4m higher. Within this segment, €30.8m were relative to Financial Services (an 8.8% decreased compared to 2019, which amounts to -€2.8m) and €13.0m to Retail (representing a 2.5% decrease relative to 2019, amounting to -€0.4m) (CTT, 2021).

Within the Financial Services, the revenue division is the following:

In terms of savings and insurance, public debt certificates, which had a decreased of €3.2m representing a negative variation of 12.8% compared to 2019 (partly due to a slight decrease in subscriptions), now stand at €22.1m. Capitalization insurance products had a 32.2% decrease compared to 2019 which translated to a negative variation of €0.5m. This culminated to an overall decrease of 3.5m (13.1%) (CTT, 2021).

Money orders revenues had an increase of €0.4m compared to 2019 (+7.5%) and are now at €6.0m. This positive variation was mainly due to the delivery of unemployment and welfare subsidies, as an agreement with the Portuguese government (CTT, 2021). Lastly, CTT payment services had, in 2020, an increase in revenues of €0.3m, which constituted a positive variation of 31.0% compared to 2019, amounting to €1.5m at the end of the year. The overall performance of this segment is as follows:

Table 4.6 - Financial Services & Retail Revenues

	2019	**2020**	**Δ%***
Financial Services	**33.6**	**30.8**	**-8.8%**
Savings & Insurance	26.8	23.3	-13.1%
Money orders	5.6	6.0	7.5%
Payments	1.2	1.5	31.0%
Retail products & services	**13.4**	**13.0**	**-2.5%**
Other	**0.4**	**0.2**	**-51.8%**
Revenues	**47.4**	**44.0**	**-7.1%**

Source: CTT, 2021

* The variations shown may not correspond exactly to the values in the table due to rounding.

4.3. Stock Price Overview and Shareholder Structure Characterisation

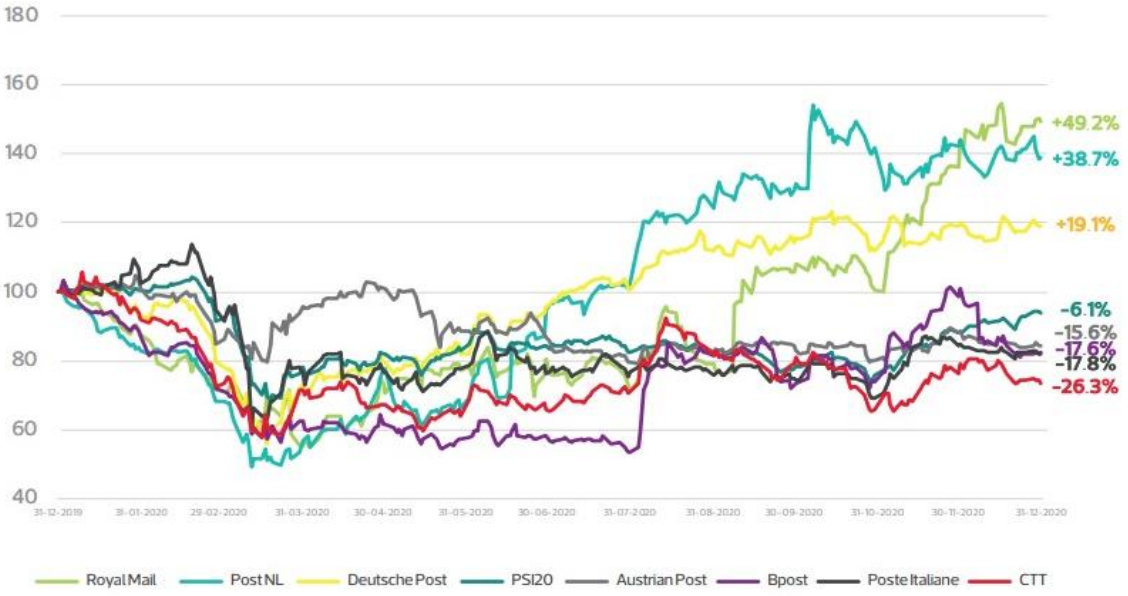
4.3.1. Stock price Overview

During 2020, approximately 165 million CTT shares were traded, which corresponds to a daily average of approximately 641,000 shares.

In the last trading session of the year, on 31 December 2020, the closing price of the CTT share was €2.35 (CTT, 2021).

In order to face the economic and health crisis that arose during the year, CTT's board of directors proposed to its shareholders the allocation of the net profit of the company to retained earnings, hence not having place the distribution of any dividends.

However, in the scope of a positive scenario, and with a slowly but steady return to normality, in May 2021, CTT distributed dividends totalling €12.750.000,00, corresponding to €0,085 per share (CTT, 2021).



Source: CTT, 2021

Figure 4.1 - CTT share performance vs PSI 20 & EU postal peers

Regarding the share price variation of CTT and its peers, Royal Mail had the best performance amongst all, with a 49.2% appreciation, while the rest of the peers had variations between +38.7% and -17.8%. CTT's share evolution was a 26.3% decrease relative to the beginning of the year. During the same period, the PSI 20 declined 6.1% and had a total shareholder return of -2.7% (CTT, 2021).

4.3.2. Shareholder Structure Characterisation

As of 31 December 2020, CTT's share capital was €75,000,000.00, represented by 150,000,000 ordinary shares with nominal value of €0.50 each. It is listed for trading on Euronext Lisbon and its shareholders structure has the following composition:

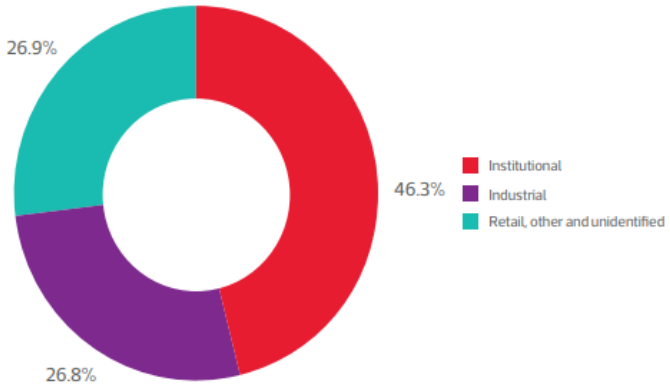
Table 4.7 - CTT Shareholder Structure

	Shares	**Share Capital**
Manuel Champalimaud, SGPS, S.A.	19,683,269	13.12 %

Global Portfolio Investments, S.L.	15,057,937	10.04 %
GreenWood Builders Fund I, LP	10,020,000	6.68 %
Green Frog Investments Inc	7,730,000	5.15 %
Norges Bank	3,105,287	2.07 %
Bestinver Gestión S.A. SGIIC	3,024,366	2.02 %
CTT, S.S. (own shares)	1,500,001	1.00 %
Other shareholders	89,879,140	59.92 %
Total	**150,000,000**	**100.00 %**

Source: CTT, 2020a

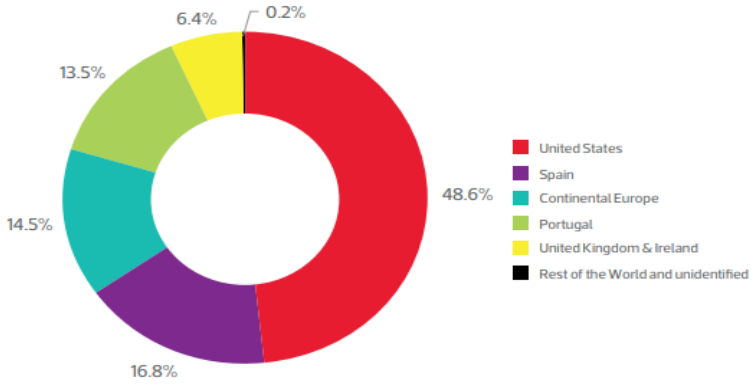
According to a study carried out by CTT, at the end of 2020, with the aim to characterise its capital structure, 139 institutional shareholders were holding 46.3% of the company's capital, while 2 industrial shareholders were holding 26.8%. The remaining percentage, 26.9%, was held by retail, other and unidentified investors, as follows (CTT, 2021):



Source: CTT, 2021

Figure 4.2 - Capital Structure by Investor Profile

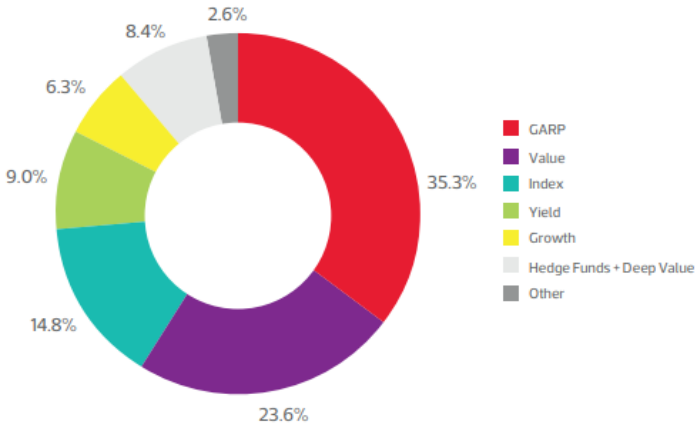
In geographical terms, CTT's institutional shareholders were distributed by several regions. Starting with the biggest percentage, the United States of America come in first with 48.6%, followed by Spain with 16.8%, Continental Europe (which mainly includes France and Germany) with 14.5% and Portugal with around 13.5%. Lastly, United Kingdom and Ireland close the main regions with 6.4%. Note that there is a residual 0.2% which is composed by the rest of the world or is currently unidentified, as follows (CTT, 2021):



Source: CTT, 2021

Figure 4.3 - Geographical Breakdown

In terms of CTT's shareholder composition by investment strategy, institutional investors with a GARP (growth at a reasonable price) investment strategy represented the biggest stake, with 35.3%. Following this, those with a Value investment strategy represented 23.6%, Index investors represented 14.8%, investors with a Yield strategy represented 9% and those with a Growth strategy represented about 6.3%. Lastly, institutional investments from Hedge Funds and Deep Value represented in total 8.4%, constituted by 4.6% and 3.8% respectively, as follows (CTT, 2021):



Source: CTT, 2021

Figure 4.4 - Institutional Shares by Investment Strategy

4.4. Strategic Analysis

CTT´s strategic plan is focused on the two key elements of its business model, companies and people. In the case of companies, CTT's mission is to be a business and commerce services provider, promoting e-commerce and being efficient while simplifying their physical & digital presence. In the client spectrum, it aims to be the closest way for communication and financial services (CTT, 2021). To do this, CTT resorts to optimizing their five main inputs, which are the following: Financial Capital - mainly focused on management efficiency,

portfolio diversification and its results, while still enhancing existing networks; Human Capital - continuing with the talent development policies; Intellectual Capital - showing trust and proximity of the brand, deep know-how and experience while maintaining an innovation strategy; Social Capital - encouraging partnership and cooperation protocols with institutions and Natural Capital - maintaining the high standards of integrated quality, environment and safety policies (CTT, 2021).

These inputs are then aligned with the three big objectives set by the company for the main business segments (Mail, Express & Parcels, CTT Bank and Financial Services), in order to achieve CTT's strategic outputs for the near future.

Source: CTT, 2021 and own elaboration

Figure 4.5 - Strategic Objectives

Consequently, CTT's strategic outputs for the next years are having a higher value for shareholders, promoting a sustainable and solid growth, better training and higher work satisfaction for employees, promotion digital transformation and entrepreneurship, foment proximity to the populations while contributing to their development and reduce its environmental impact (CTT, 2021).

4.4.1. Porter's Five Forces

In order to accurately portray CTT's strategic relationships with their competitors and within their sector, Porter's five forces model (Porter, 1979) is a useful resource.

Published in Harvard Business Review, this model was introduced as a way to determine the long-run profitability of any industry. Through the determination of how the economic value an industry creates is apportioned, it is possible to arrive at the five forces. Therefore, the economic value created by an industry can be drained away through competitive rivalry, bargained away through the power of suppliers or customers and constrained by the threat of new entrants or substitutes.

Competitive Rilvary

The markets where CTT operates are, in average, moderatevely competitive, since there are some where the competition is very high and others that are less competitive.

Mail: Over the years, this segment has seen its growth rate decrease without many signs of recovery. Despite this, there are still a few players in this market beyond CTT that most likely aim to increse their market share. Nevertheless, this it is still considered as a weak threat for CTT, given that its market share is considerably bigger than that of its competitors, as seen below:

Table 4.8 - Total Postal traffic share

	2019	**2020**	**Δ%***
CTT Group	88.4 %	86.1 %	-2.3 %
CTT	85.1 %	81.1 %	-4.0 %
CTT Express	3.1 %	4.9 %	1.8 %
CTT Contact	0.1 %	0.1 %	-0.1 %
Transports	0.1 %	-	0.0 %
Premium Green Mail	4.4 %	5.6 %	1.2 %
GEOPOST Group / DPD	2.2 %	2.6 %	0.4 %
Vasp Premium	1.1 %	1.3 %	0.2 %
Nacex Group	0.5 %	0.8 %	0.3 %
Servinasa	0.4 %	0.6 %	0.2 %
TNT express	0.6 %	0.6 %	0.0 %
News direct	0.7 %	0.6 %	-0.2 %
Other operators	1.7 %	1.9 %	0.2 %

Source: ANACOM, 2020

* The variations shown may not correspond exactly to the values in the table due to rounding.

Express & Parcels: In this segment there is a considerably bigger competitiveness with the other players compared to the mailing segment. However, its intensity is considered moderate since CTT are stil market liders by a sizable margin, as follows:

Table 4.9 - Parcel traffic share

	2019	**2020**	**Δ%***
CTT Group	44.5 %	49.6 %	5.1 %
GEOPOST Group / DPD	30.1 %	25.8 %	-4.4 %

Nacex Group	5.7 %	6.5 %	0.9 %
Vasp Premium	4.9 %	5.6 %	0.7 %
TNT express	6.3 %	4.7 %	-1.6 %
MRW Group	2.7 %	4.3 %	1.6 %
CEP Group	1.9 %	1.9 %	0.0 %
Other operators	3.9 %	1.6 %	-2.3 %

Source: ANACOM, 2020

* The variations shown may not correspond exactly to the values in the table due to rounding.

CTT Bank & Financial Services: These two business segments face similar competition in the markets they operate in. The competitiveness of these markets is considered to be strong, since there are many players envolved that offer a vast diversity of services and products. The prices, interest rates and fees are also very competitive since consumers are specialy sensitive to them in these particular markets.

Threat of New Entrants

As in the previous force, it is important to analyse the impact of new entrants in the different business segments CTT operates in. In the Mail segment, the threat is weak, not only due to the decrease in its sales and growth, but also because of the growing importance e-commerce as had in the last few years, which discourages possible new entrants in this segment.

The Express & Parcels segment, much like in mail, has seen digitalization shift the consumers interest, however, due to its nature, parcels are still very relevant and for that the threat here is considered to be moderate.

Grouping again the CTT Bank and the Financial Services segments, it is clear that the threat here is strong, with the prime example being the CTT Bank itself, which entered the market in 2014 and was able to capture clients and significantly increased its market share.

Supplier Bargain Power

Given the segments in which CTT operates, there is no real threat with the suppliers' bargain power. The Mail and the Express & Parcels segments resort to suppliers for simplistic products in industries where competitiveness is strong and the options are many.

The CTT Bank and Financial Services also do not heavily rely on suppliers, so suppliers bargain power also poses as a weak threat for these segments.

Lastly, it is important to note that although CTT has an extensive relationship with several suppliers, the fact that the group has vast resources (such as transportation means, stores, facilities and warehouses) enables them to be more independent in regard to supplier bargain power, making it an overall weak threat.

Buyer Bargain Power

In this regard, CTT has to consider two types of clients, regular clients and institutional clients.

Regular clients bargain power poses a small threat in the Mail and Express & Parcel segments, given the considerable market share and top of mind status of CTT in these segments. Institutional clients bargain power in these segments accounts for a moderate threat given that some of these clients are big institutions, private and public.

In CTT Bank and Financial Services segments, this threat is considered to be strong since clients, either regular or institutional, can easily chose to interact with any other player in the market.

Threat of Substitution

The threat of substitute alternatives is undeniably strong in the Mail segment, with the relevance of e-commerce, email and the overall global digitalization over the recent years, this segment is strongly subjected to this threat.

In the Express & Parcels segment, this threat has a moderate effect. Although there may be alternatives in the future for parcels and similar services, it is expectable that these will still remain relevant in the near future.

The CTT Bank and Financial Services segments can be exposed to the threat of substitution given that many options are available in today's market. Nevertheless, with the constant innovation and improvement implemented by CTT in these segments, this threat is relatively moderate.

5. Macroeconomic Overview

5.1. Economic Framework

Worldwide

The covid-19 pandemic had a never seen before negative impact on the world's economy. Although its effects were felt in every nation across the globe, those whose economy heavily relied on productive structures and activities that cannot be carried out while maintaining the social distancing required at the time, where the more impacted (CTT, 2021).

With the aim of mitigating the impacts of the health crisis, euro area's monetary policy was of an expansionary character. With 1,850 billion euros until 2022, the pandemic emergency purchase program, developed by the European Central Bank, was a booster to significantly reduce the risk premium on sovereign debts (European Central Bank, 2020).

As a consequence of the adverse effects of the pandemic in the world's economy, global GDP decreased by 4.5% in 2020, a negative result taking into consideration that in the previous year there was a 2.7% increase in the global GDP (Organization for Economic Co-operation and Development [OECD], n.d.).

Portugal

Regarding the Portuguese economy, GDP in 2020 suffered a 7.6% decrease, which was an even worse indicator if taken into consideration the European Union's average of a 6.8% decrease (Banco de Portugal, 2021).

This steep decrease reflected the pandemic situation lived in the country, with the main causes being the decline in domestic demand and exports, with a particularly negative contribution from the service exports due to tourism related services (Banco de Portugal, 2021). Still according to Banco de Portugal (2021), in the first half of 2020 the economic activity shrank by 17.3% compared to the end of 2019. However, in the 3rd quarter, coinciding with the lifting of some restrictions, GDP growth was of 13.3% compared to the previous quarter. Unfortunately, this scenery did not last long since, in the 4th quarter of the year, with the worsening of the pandemic in Portugal, the previous progress was lost (CTT, 2021). This regression in progress was also partially due to the decrease in private consumption, which is a main component of demand, given that the unemployment rate rose to 7.3% in 2020 (compared to 6.5% in 2019) which substantially altered the common household's personal finances (Instituto Nacional de Estatística, 2021).

In sum, the sanitary crisis in 2020 culminated in an aggravation of the public debt ratio to 137.7% of the GDP (Banco de Portugal, 2021).

5.2. Sectorial Framework

As previously stated, 2020 was a year strongly market by the covid-19 pandemic that affected millions worldwide. Just like it had different impacts in different people, the crisis also had different impacts in different segments.

The Mail segment was, as predicted, heavily impacted by the changes that occurred. Being a sector in clear decline, the complete shutdown of most physical activities for a big portion of the year had a massive negative impact on mail volumes. To add to this, most individuals and companies facilitated the growing of digitalization by adopting new ways of living and working (CTT, 2021).

On the other hand, the Express & Parcels segment registered an acceleration in volumes, largely due to the considerable increase in e-commerce (in a time were almost all non-essential physical retail stores were closed) which indicated the ability society has for adaptation (CTT, 2021).

In average terms, as it can be consulted in the table below, operators in the same sector as CTT had, in average, a steeper decline in the addressed mail segment. On the other hand, and although CTT had a significant increase in the Express & Parcels, the sector registered an even higher growth, as follows (CTT, 2021):

Table 5.1 - Growth levels in Mail and Express & Parcel volumes for CTT and the sector (% YoY quarterly comparison)

	1st quarter		**2nd quarter**		**3rd quarter**	
	CTT	Sector Average	CTT	Sector Average	CTT	Sector Average
Addressed mail	-11.8%	-10.5%	-24.5%	-20.2%	-15.1%	-13.5%
Addressed advertising mail	-15.3%	-11.2%	-24.3%	-41.0%	-21.2%	-17.3%
Unaddressed advertising mail	8.6%	-14.6%	-48.4%	-40.9%	-12.0%	-21.9%
Express & Parcels	20.4%	11.5%	49.3%	42.5%	33.6%	30.6%

Source: CTT, 2021

6. Valuation

6.1 Firm Valuation

The aim of this chapter is to valuate CTT's share as of December 31st, 2020. To do this, the Discounted Cash Flow approach (namely the Firm Valuation model - FCFF) will be used. In addition, a Relative Valuation will also be performed.

6.1.1. General Assumptions

Historic and explicit period

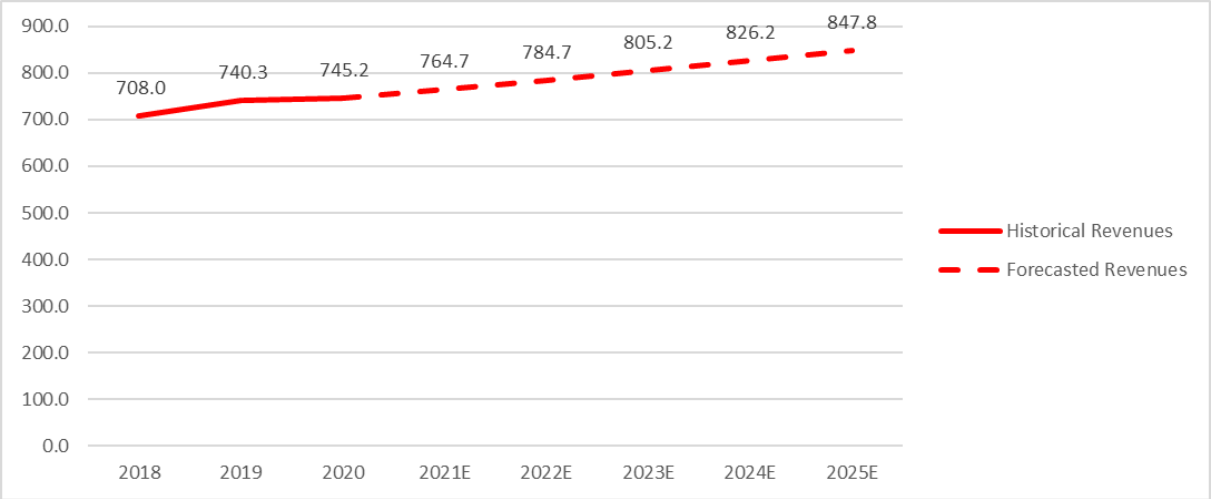
In order to carry out an historical analysis of CTT, data from 2018 to 2020 was considered, namely the historical Balance Sheet and historical Income Statement (see Annex C and Annex D). The year 2018 corresponds to the first full year of data and the year 2020 to the last year with available information. The explicit period of forecasts considered is 5 years, from 2021 to 2025, inclusive.

Macroeconomic Assumptions

According to Banco de Portugal (2021), after a 7.6% decrease in 2020, the Portuguese GDP will increase 4.8% in 2021, 5.6% in 2022 and 2.4% in 2023. These values are the ones to consider when selecting the stable growth rate (g_n) (see chapter 2.1.1.), since Damodaran (2012) suggests that, in the long term, it is not reasonable for companies to grow above the economy in which they operate (in the case of CTT, the Portuguese economy).

6.1.2. Revenues

In order to compute the forecasted revenues from 2021 to 2025 shown below, an average of the growth rate (2.6%) of the historical period (from 2018 to 2020) was computed. Afterwards, that growth rate was multiplied by the revenues in 2020 to achieve the value of 2021 and so on for the rest of the years in the explicit period (from 2021 to 2025). It is expected that, and although the mailing segment is in a clear decline, the CTT Bank, with its good performance, keeps offsetting that decline which will enable CTT to have a constant grow in revenues.

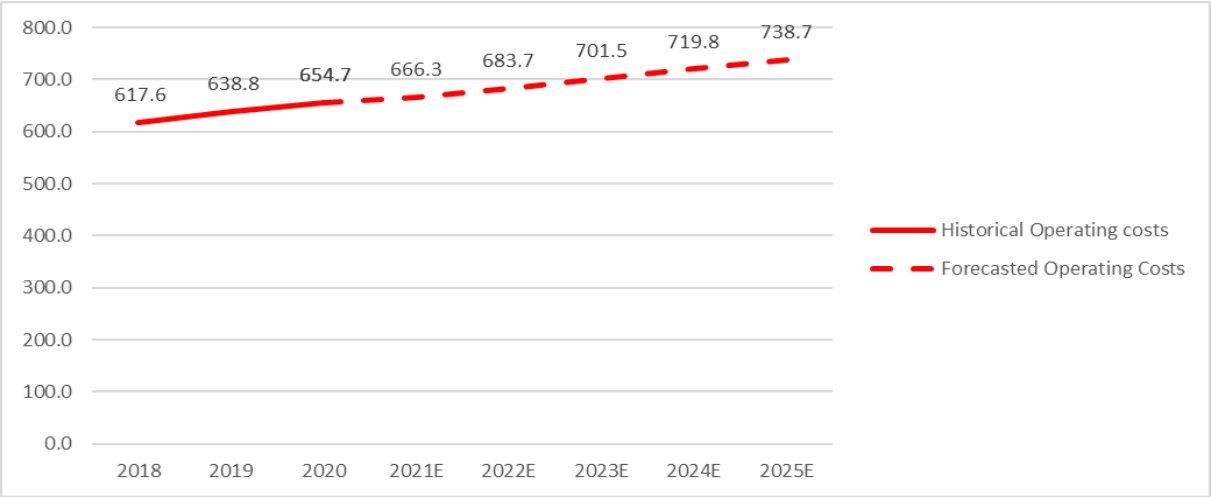


Source: CTT, 2019, 2020b, 2021 and own calculations

Figure 6.1 - Revenues (Historical and Forecasted) (Million €)

6.1.3 Operating Costs

The operating expenses were forecasted as a percentage of the revenues. An average of the percentage of revenues spent on operating costs (87.1%), in the historical period, was computed and used as a benchmark for the explicit period.



Source: CTT, 2019, 2020b, 2021 and own computations

Figure 6.2 - Operating Costs (Historic and Forecasted) (Million €)

6.1.4. Depreciation

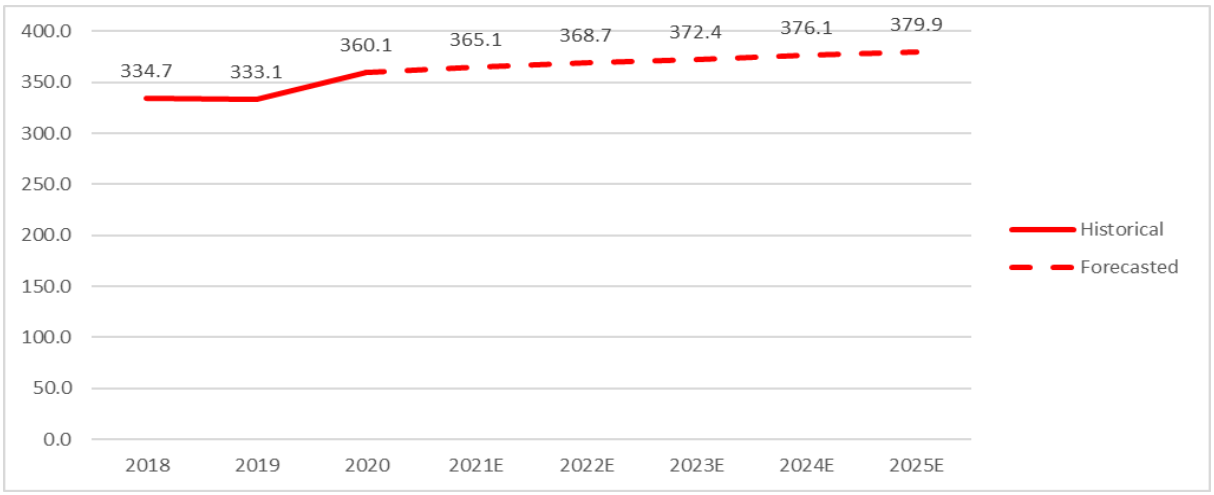
In order to forecast depreciations, it is firstly necessary to define what type of assets are subject to depreciation. According to CTT Integrated Report 2020 (CTT, 2021), depreciations apply to fixed tangible assets, intangible assets and investment properties. Taking this into consideration, the total value of these assets, in the historical period, was the following:

Table 6.1 - Assets affected by depreciation (Million €)

	2018	2019	2020
Fixed tangible assets	269.7	263.4	295.0
Intangible Assets	56.8	62.0	58.0
Investment Properties	8.2	7.7	7.1
Total	**334.7**	**333.1**	**360.1**

Source: CTT, 2019, 2020b, 2021

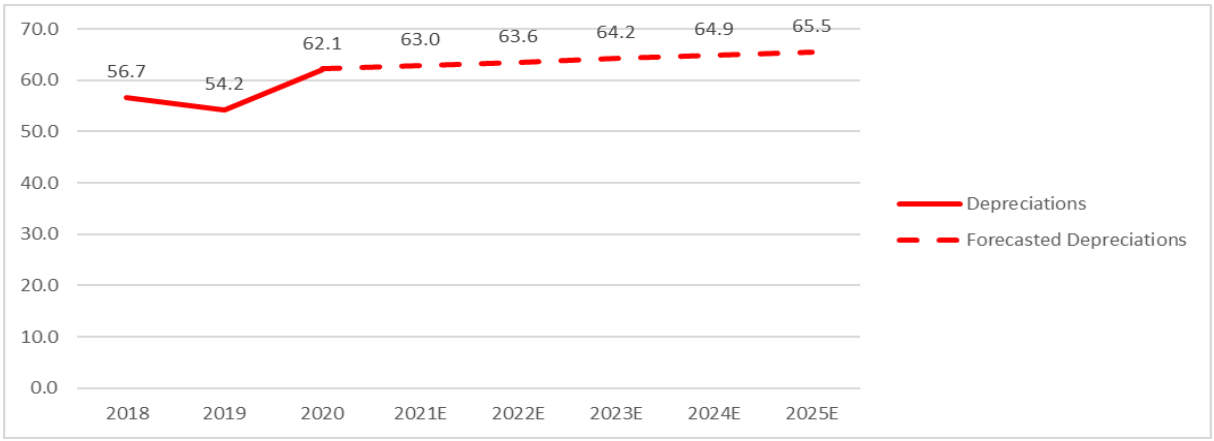
Although there was, in 2020, a significant investment in fixed tangible assets, it is expected, by CTT, that a smaller and more stable growth is registered in the following years:



Source: CTT, 2019, 2020b, 2021 and own computations

Figure 6.3 - Assets subject to depreciation (Historical and Forecasted) (Million €)

Thereupon, using the historical values, the depreciations were computed as a percentage of these assets' values. An average of said percentage was then calculated and multiplied by the forecasted values of these assets to achieve the forecasted depreciations for the explicit period, as follows:



Source: CTT, 2019, 2020b, 2021 and own computations

Figure 6.4 - Depreciations (Historical and Forecasted) (Million €)

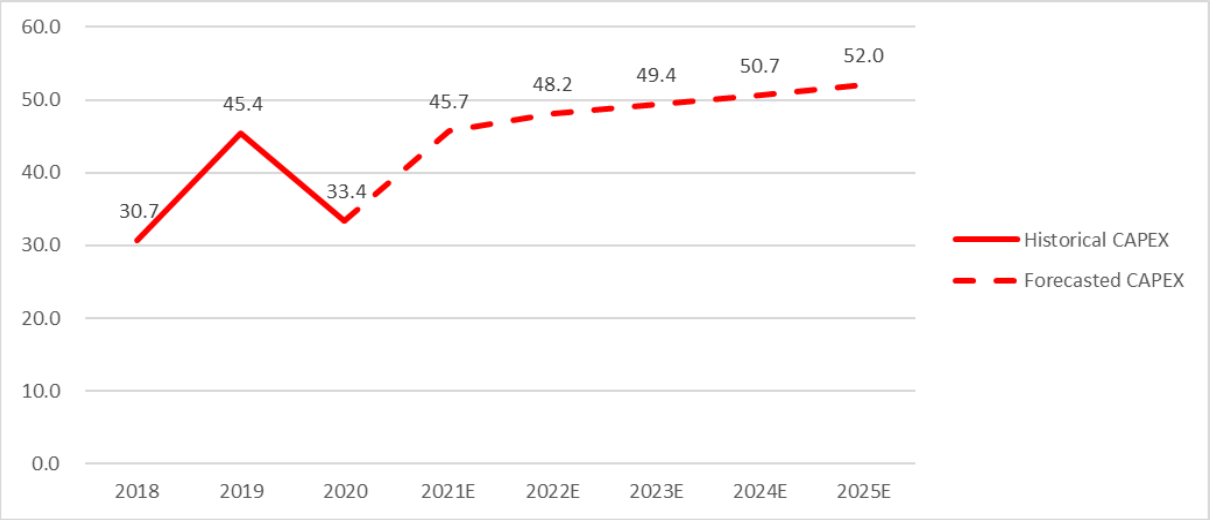
It is important to note that depreciations are a non cash item and therefore are only relevant for fiscal purposes. Given that depreciations decrease tax basis (from EBITDA to EBIT), there is an occurrence of tax savings. Thus, depreciations are considered for the computation of adjusted taxes but are later added again to the NOPLAT in order to compute the FCFF.

6.1.5. CAPEX

The capital expenditure (CAPEX) of CTT had been growing relatively well in historical years, mainly with the introduction of e-commerce and CTT Bank.

However, due to the health crisis, it was significantly impacted in 2020 in relation to 2019. The reduction of equipment in the mail segment (-€8.4m), where the investment was strong in 2019, and the decrease in IT investment for the other segments (-€7.4m) were the main contributors. Nevertheless, the focus of CTT's investments remained in the segments where it has shown growth, such as the Express and Parcels (+€10.7m) and CTT Bank (+€6.3m) (CTT, 2021).

Given that the CAPEX is strongly correlated with the revenue levels and following CTT´s predictions of expecting a significant growth in CAPEX in the next few years, it was considered the pre-pandemic (2019) percentage of CAPEX in relation to the revenues as a benchmark for the forecasted years.



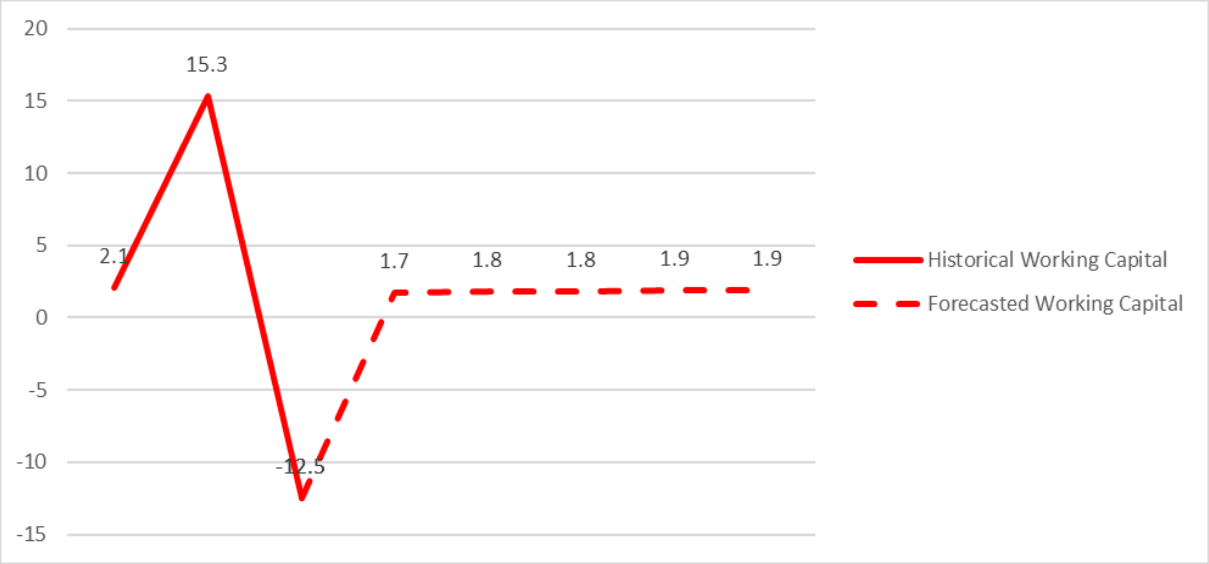
Source: CTT, 2019, 2020b, 2021 and own calculations

Figure 6.5 - CAPEX (Historical and Forecasted) (Million €)

6.1.6. Working Capital Variation

In 2020, the negative evolution of the change in working capital compared to 2019 (-€12.5m) originated from the high investment verified at the end of 2019. Given that CTT has not

disclosed any strategic plans regarding management of working capital in the next years, to compute the forecasted working capital variation it was assumed that the working capital would have a constant growth in the near future. Therefore, the historical working capital was computed as a percentage of the revenues and subsequently and average of that value was obtained. Lastly, that historical relation average was multiplied by the revenues of the forecasted years to obtain the forecasted working capital. The variation between the working capital of these years was considered as the forecasted working capital variation, as follows:



Source: CTT, 2019, 2020b, 2021 and own computations

Figure 6.6 - Working Capital Variation (Historical and Forecasted) (Million €)

6.1.7. WACC

There are several assumptions that need to be made before computing the WACC, as follows:

Tax Rate: According to Damodaran (2021a), the effective corporate tax rate to be used in Portugal is 21%.

Cost of Equity (k_e): To compute it, three variables need to be estimated.

Risk-free rate - The reference for the risk-free rate considered was the Portuguese 10-year government bond yield of 0.061%, as of December 31st, 2020 (Bloomberg, n.d.).

Beta - The Beta was computed through a linear regression between the return on the CTT shares and the return of the PSI 20 index (see Annex E), in a period from 31st of December 2015 to the 31st of December 2020, recurring to Yahoo Finance data. The beta achieved was of 0.97, which means that an investment in CTT shares represents less risk than an investment on the PSI 20 index.

Market Risk Premium - The equity risk premium considered is 6.85% with the addition of 2.13% accounting for the country risk premium of Portugal, which are the values recommended by Damodaran (2021a) as of December 31st, 2020. Thus, the market risk premium is 8.98%.

Therefore, the cost of equity (k_e) is as follows:

$$k_e = 0.061\% + 0.97(8.98\%) = 8.7716\ \% \quad (25)$$

Cost of Debt (k_d): This variable is considerably difficult to estimate since it reflects the effective rate on which CTT pays all its obligations, which in turn are emitted in different moments and with different values. Given the fact that CTT does not discloses a full breakdown of their obligations, the method used was the interest coverage ratio, according to Damodaran (2012). According to the author, this method relates the interest coverage ratio of a firm to a synthetic rating, which is then accordingly linked to a default spread (see annex A). When added to the risk-free rate, this default spread yields the pre-tax cost of borrowing for a company. Therefore, the cost of debt (k_d) is computed in the following manner:

Table 6.2 - Interest cover ratio inputs (Million €)

EBIT 2020	34.5
Interest Expenses 2020	9.7
Risk-free rate	0.061%

Source: CTT, 2021 and Bloomberg

$$Interest\ Coverage\ Ratio = \frac{34.5}{9.7} = 3.6 \quad (26)$$

According to Annex A, the table which relates the interest cover ratio to the default spread, the results are the following:

Table 6.3 - Interest Coverage Ratio

Interest Coverage Ratio	3.6
Estimated bond rating	Ba1/BB+
Estimated default spread	2.31%

Source: Damodaran, 2021b

Lastly, the pre-tax cost of debt (k_d) is as follows:

$$\text{Cost of Debt } (k_d) = 0.061\% + 2.31\% = 2.371\% \quad (27)$$

Debt and Equity ratio (Million €): The market value of equity is computed by considering the number of shares outstanding (150,000,000 in the case of CTT) multiplied by the current stock price (€2.35 as of December 31st, 2020).

$$Market\ Value\ of\ Equity = 150{,}000{,}000 \times 2.35 = 352{,}500{,}000 \quad (28)$$

The market value of debt was considered, for simplification purposes, as being equal to the book value of debt. Therefore, from the financial statements of CTT, the market value of debt amounts to €251,373,751.

$$\frac{E}{E+D} = \frac{352{,}500{,}000}{352{,}500{,}000 + 251{,}373{,}751} = 58\% \quad (29)$$

$$\frac{D}{D+E} = \frac{251{,}373{,}751}{251{,}373{,}751 + 352{,}500{,}000} = 42\% \quad (30)$$

Lastly, the WACC can be computed, as follows:

$$WACC = 8.7716\,\% * 58\% + 2.371\,\% * (1 - 21\,\%) * 42\,\% = 5.87\% \quad (31)$$

6.1.8. Results

Taking into consideration all the assumptions and computations made above, the FCFF results are as follows:

Table 6.4 - FCFF Results (Milion €)

	2021EP	**2022EP**	**2023EP**	**2024EP**	**2025EP**
Revenues	764.7	784.7	805.2	826.2	847.8
Operating Expenses	666.3	683.7	701.5	719.8	738.7
EBITDA	98.4	101.0	103.7	106.4	109.1
Depreciations	63.0	63.6	64.2	64.9	65.5
EBIT	35.4	37.4	39.5	41.5	43.6
Taxes	7.5	7.9	8.3	8.7	9.2
NOPLAT	27.9	29.5	31.2	32.8	34.4
Depreciation	63.0	63.6	64.2	64.9	65.5
Operational Cash Flow	90.9	93.1	95.4	97.7	99.9
CAPEX	45.7	48.2	49.4	50.7	52.0
Δ Working Capital	1.7	1.8	1.8	1.9	1.9
FCFF	43.5	43.1	44.2	45.1	46.0

Source: Own computations

Having computed the FCFF, and considering the WACC and the discounted terminal value[3], the Enterprise Value was computed:

[3] see Annex F

Table 6.5 - Enterprise Value (Million € - except when specified)

WACC	5.87%
Terminal Value	1,068.5
NPV FCFF	187.3
Discounted Terminal Value	803.4
Enterprise Value	**€990.7**

Source: Own Computations

Posteriorly, the Equity Value of CTT was computed. To do this, it was added to the Enterprise Value the non-operating assets and subtracted the financial debt and the non-operating liabilities, as shown below:

Table 6.6 - Equity value and Price target per share (Million € - except when specified)

Enterprise Value	990.7
Non-Operating Assets	
Excess Cash	135.4
Investment Properties	7.1
Non-Operating Liabilities	
Employee Benefits	(283.0)
Provisions	(17.4)
Deferrals	(3.7)
Other Current Liabilities	(99.5)
Financial Debt	(91.7)
Equity Value	637.9
Number of shares	150
Price target per share	**€4.25**

Source: CTT, 2021 and own computations

The Equity value of €637,856,094 was obtained and divided by the 150,000,000 shares, resulting in a price target of €4.25.

Although it is the most used approach, due to its simplistic concept and its reliability on important drivers of value, the FCFF methodology is limited to the uncertainty of being based on projections and forecasts (especially in the years that follow a global health crisis) and to the fact that the terminal value, which is also subject to an assumption, as a great influence on final result.

6.1.9. Sensitivity Analysis

While performing a free cash flow to the firm valuation, like the one above, there are several assumptions that need to be considered. Firstly, and mostly due to today's economic and pandemic context, computing free cash flows involves forecasting items that carry significant uncertainty, such as the revenues from the mail market or the proper value of investments to be made in the future.

Furthermore, the effects the economy has in the company's operations and in its opportunity to grow within its industry, as well as the need to obtain such important and volatile information from different and sometimes inconsistent sources, inevitably affects the computation of the company's price target per share. Having taken all this into consideration, it is important to understand that the value of a company largely depends on these assumptions, and a slight difference in them may lead to a considerably change in its value.

As a mean to consider this volatility, a sensitivity analysis accounting for the perpetual growth rate and the WACC was performed, given that these are two of the variables that affect the share's price the most. The results were as follows:

Table 6.7 - Sensitivity Analysis

		WACC				
		3.87%	**4.87%**	**5.87%**	**6.87%**	**7.87%**
g_n	**1.10%**	€8.23	€5.42	€3.78	€2.72	€1.97
	1.30%	€8.97	€5.79	€4.01	€2.86	€2.07
	1.50%	€9.83	€6.21	€4.25	€3.02	€2.18
	1.70%	€10.86	€6.69	€4.52	€3.19	€2.29
	1.90%	€12.09	€7.23	€4.82	€3.37	€2.41

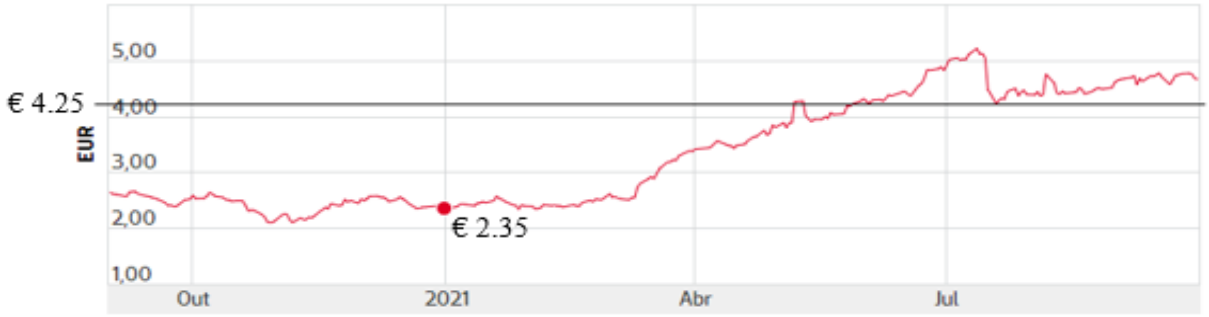
Source: Own computations

As it is possible to observe, both variables have distinct impacts on the share's price. The higher the perpetual growth rate is, the higher the price of the share. In contrast, the higher the WACC is, the lower the price of the share.

In conclusion, and considering all other variables and assumptions unchanged, the modification of the perpetual growth rate and the WAAC could inflict a variation that goes from €1.97 to €12.09 for the share's price.

6.1.10. Other Analysis

Although the CTT's share price registered on December 31st, 2020, differs from the one achieved in this valuation (€2.35 to €4.25, respectively), its future evolution corroborates this analysis in stating that CTT's share price was undervalued at the time, as follows:



Source: CTT and own computations

Figure 6.7 - CTT share price evolution (From September 1st 2020 to September 30th 2021)

As it can be observed, and even in the context of a pandemic (which may have slowed the correction process), the market reacted to the fact that CTT's share was undervalued and corrected it to levels coinciding with those obtained in this valuation, at which it has now approximately stabilized.

6.2. Relative Valuation

After performing CTT's valuation using the free cash flows to the firm methodology, it is deemed relevant to complement it with the performance of a relative valuation approach. The objective of this analysis is to estimate CTT' share price through data obtained from its peer group, which is a set of companies operating in the same industry, under similar circumstances and resembling value drivers.

Peer Group

For the selection of the peer group[4], the companies were chosen based on different criteria, such as: field area (companies operating in the same industry and sector as CTT), region (companies within Europe) and companies listed on stock exchange. Considering these criteria, the below table was constructed, which lists the five companies selected, all being European companies that operate in the postal and express & parcels sectors.

Table 6.8 - Peer Group

Company	Country	Market Cap
CTT - Correios de Portugal, S.A.	Portugal	€352,500,000

[4] See annex G

Bpost	Belgium	€1,698,008,490
Deutsche Post	Germany	€50,179,500,000
Poste Italiane	Italy	€10,824,320,000
PostNL	Netherlands	€1,431,973,080
Royal Mail Group	United Kingdom	€4,867,589,905

Source: Trading View and own computations

Multiples

In the table below it is possible to observe a comparison between the multiples of each company in the selected peer group:

Table 6.9 - Multiples Comparison

Company	**EV/EBITDA**	**P/E**	**P/B**	**P/S**
CTT - Correios de Portugal, S.A.	0.14	21.15	2.35	0.48
Bpost	4.49	35.67	2.92	0.41
Deutsche Post	8.70	16.82	3.64	0.77
Poste Italiane	23.55	8.97	0.94	0.36
PostNL	4.38	6.48	6.31	0.43
Royal Mail Group	4.38	8.34	1.08	0.41
Minimum	0.14	6.48	0.94	0.36
Average	7.6	16.2	2.87	0.48
Median	4.44	12.89	2.64	0.42
Maximum	23.55	35.67	6.31	0.77

Source: Trading View and own computations

CTT's EV/EBITDA ratio is significantly inferior to the average of its peer group, which can indicate it is undervalued compared to its peers. In terms of P/E, CTT has this ratio above the average of the peer group, which although is not a positive occurrence, can indicate that investors expect higher growth from the company compared to the overall market, which can be verified in CTT's share subsequent movement after this valuation's date. The P/B ratio is slightly lower than the average of the peers which is once again a sign that CTT's share might be undervalued, since this ratio compares the company's market value to its book value. Lastly, the P/S ratio is on par with the peers' average, and since it indicates the value that financial markets have placed on each unit of the company's revenue, it is positive for CTT.

Using the EV/EBITDA and the P/E ratios, chosen for being the most relevant amongst analysts, it is possible to compute the value of CTT's share, as follows:

Table 6.10 - Price target per multiples (as of December 31st, 2020)

	EV/EBITDA	P/E	Average
Price Target of CTT's share[5]	€1.78	€2.23	€2.01

Source - Own computations

Opposing to the results of the free cash flow to the firm methodology, the relative valuation approach concludes that CTT's share is slightly overvalued on December 31st, 2020.

Nevertheless, relative valuation has some considerable constraints and shortcomings, such as its simplistic approach, the fact that a considerable amount of information is compressed into a single number, its difficulty to capture the dynamic and ever-evolving environment of a business (since multiples only represent a company at a certain point in time) and its tendency to mainly focus on the short term, which neglects the potential performance projected for the long term.

Given all of these arguments, the results considered as a benchmark for a recommendation to be based on were the free cash flow to the firm methodology results, which suggest that the share is undervalued at the date in analysis.

[5] See annex H

7. Conclusion

Valuation is defined as the analytical process that allows the determination of the current or projeted worth of an asset or a company. This, in itself, has implicit a certain degree of subjectivity, since it is a process subject to future conditions, which leads to the inevitability of making assumptions about a company and the financial and economic enviorment around it.

In this regard, the objective of this work consisted in performing a valuation of CTT, while considering all aspects of its business and the market it operates in, with the goal of obtaining the price target for its share on December 31st, 2020.

The first step was to introduce the concept of valuation models, where several of the most used approaches were discussed as a means of achieving the value of any asset or any given company. After a thoughful analysis and description of each approach, including their advantages, shortcuts and adjacent assumptions, it was concluded that choosing one, or more, to apply to a company, was always dependent on that company's struture.

Hereupon, the main approach chosen for the valuation of CTT was the Discounted Cash Flow approach (Firm Valuation - Free Cash Flow to the Firm methodology), considering that the company is in a maturity phase and has a constant capital structure. To perfom the analysis according to this approach, the four main segments of the company were analysed and with the basis acquired in said analysis, the main financial indicators and key income statement items were forecasted. The foundation for such analysis and forecasts were the 2018, 2019 and 2020 CTT Integrated Reports, which provided a clear view of the strategy and financial position of the company over these historical periods. Additionaly, it is important to note that, like any other approach, the free cash flows to the firm methodology also relies on significant assumptions, about the company itself and the market. These assumptions were made based on the most reliable and recent data at the time of the analysis and, therefore, are subject to possible future changes. To account for this uncertainty, after achieving the price target of CTT's share through the chosen methodology, a sensitivity analysis was performed to estimate how much this result would change if some key variable in its computation were to vary. Following this, the relative valuation approach was performed with the purpose of serving as a comparison to the results achieved in the first approach.

Through the free cash flow to the firm methodology, it was obtained a price target of €4.25 for CTT's share on December 31st, 2020. Given that the registered price for CTT's share on December 31st, 2020 was of €2.35, it is concluded that CTT's share was

undervalued and therefore the recommendation given is a buy recommendation. This result was later corroborated by the subsequent movement of CTT's share price towards the obtained result, where it aproximately stabilized afterwards.

In short, it is relevant to adress the atypical conditions in which this analysis was performed, since 2020 was a challenging year for the world and CTT was not an exception. Having as its core business the mailing segment, CTT has been subject to the recent changes in the world, were physical mail has been losing relevancy. To add to this, the covid-19 pandemic deeply affected this business segment, mainly due to the decrease in advertising and international mail. However, the resiliance and resourcefulness of CTT alowed the group to focus on different segments to offset the unfavorable circumstances. With a very solid performance by CTT Bank, achieving positive results for the first time since its inception in 2016, the innovations regarding e-commerce and the increase in parcels volumes (a positive colateral consequence of the pandemic), CTT, even with an expected significant decrease in profits, was able to achieve encouraging results in the end of 2020 and has given strong prospects for the future.

In conclusion, the pandemic context mentioned above made it even more relevant to address the limitations to which this work is subject. The fact that the FCFF approach relies on future estimates (which were made with an high degree of uncertainty, given the economic repercussions of the health crisis) and the fact that it has an high sensitivity to changes in the WACC and growth rate, both represent limitations that can condition the results of this work. Alied to this, some of the assumptions considered were obtained through CTT itself, which are subject to changes if the company's strategy or policies also change. It is then suggested that future works may address the previous limitations by producing estimates based on a wider historical period and that take into consideration the effects the year 2020 may have in the estimation of the growth rate used for the following years.

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9. Annexes

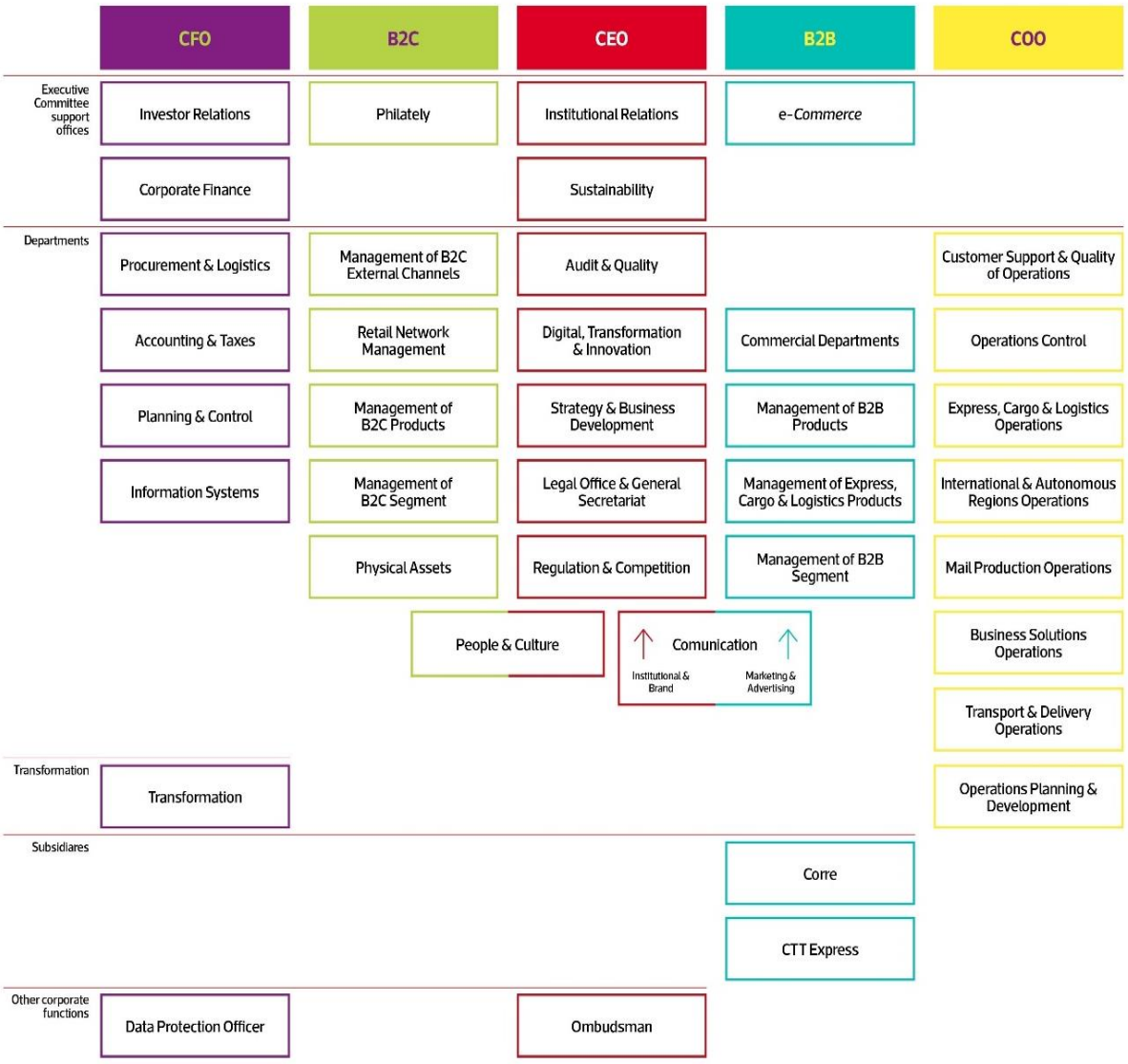
Annex A - Interest Coverage Ratio

If interest coverage ratio is			
greater than	≤ to	Rating is	Spread is
12.5	100000	Aaa/AAA	0.69%
9.5	12.499999	Aa2/AA	0.85%
7.5	9.499999	A1/A+	1.07%
6	7.499999	A2/A	1.18%
4.5	5.999999	A3/A-	1.33%
4	4.499999	Baa2/BBB	1.71%
3.5	3.9999999	Ba1/BB+	2.31%
3	3.499999	Ba2/BB	2.77%
2.5	2.999999	B1/B+	4.05%
2	2.499999	B2/B	4.86%
1.5	1.999999	B3/B-	5.94%
1.25	1.499999	Caa/CCC	9.46%
0.8	1.249999	Ca2/CC	9.97%
0.5	0.799999	C2/C	13.09%
-100000	0.499999	D2/D	17.44%

Source: Damodaran, 2021b

Figure 9.1 - Interest Coverage Ratio

Annex B - CTT's Organizational Structure



Source: CTT

Figure 9.2 - CTT's Organizational Structure

Annex C - Consolidated Balance Sheet

	31.12.2018	31.12.2019	31.12.2020	31.12.2021 EP	31.12.2022 EP	31.12.2023 EP	31.12.2024 EP	31.12.2025 EP
ASSETS								
Non-current assets								
Tangible fixed assets	264,708,624	263,443,040	294,989,377	299,072,248	302,062,971	305,083,601	308,134,437	311,215,781
Investment properties	8,179,980	7,653,000	7,075,908	7,173,844	7,245,582	7,318,038	7,391,218	7,465,131
Intangible assets	56,770,556	62,012,644	58,016,961	58,819,959	59,408,158	60,002,240	60,602,262	61,208,285
Goodwill	9,523,180	70,201,828	70,201,828	73,711,919	77,397,515	81,267,391	85,330,761	89,597,299
Investments in subsidiary companies	-	-	-	-	-	-	-	-
Investments in associated companies	296	293	481	505	530	557	585	614
Investments in joint ventures	496	2,723,803	2,925,100	3,071,355	3,224,923	3,386,169	3,555,477	3,733,251
Other investments	1,379,137	1,379,137	6,394	6,714	7,049	7,402	7,772	8,161
Debt securities	429,038,681	424,851,179	465,364,074	488,632,278	513,063,892	538,717,086	565,652,940	593,935,587
Shareholders	-	-	-	-	-	-	-	-
Accounts receivable	-	-	-	-	-	-	-	-
Other non-current assets	1,526,644	1,543,308	1,063,789	1,116,978	1,172,827	1,231,469	1,293,042	1,357,694
Credit to banking clients	231,797,420	792,469,611	985,355,687	1,047,643,779	1,114,628,609	1,185,108,708	1,259,260,299	1,337,268,430
Other banking financial assets	22,692,434	18,764,049	11,422,884	11,994,028	12,593,730	13,223,416	13,884,587	14,578,816
Deferred tax assets	81,734,114	89,329,806	87,891,868	92,286,461	96,900,784	101,745,824	106,833,115	112,174,771
Total non-current assets	**1,108,143,106**	**1,734,664,839**	**1,984,314,351**	**2,083,530,069**	**2,187,706,572**	**2,297,091,901**	**2,411,946,496**	**2,532,543,820**
Current assets								
Inventories	5,568,114	5,860,069	6,601,999	6,932,099	7,278,704	7,642,639	8,024,771	8,426,010
Accounts receivable	135,855,195	146,471,712	153,616,009	161,296,809	169,361,650	177,829,732	186,721,219	196,057,280
Credit to banking clients	16,252,561	93,350,959	107,925,845	113,322,137	118,988,244	124,937,656	131,184,539	137,743,766
Shareholders	-	-	-	-	-	-	-	-
Income taxes	5,040,275	-	-	-	-	-	-	-
Deferrals	6,691,359	7,305,261	6,498,759	6,823,697	7,164,882	7,523,126	7,899,282	8,294,246
Debt securities	25,063,201	31,560,152	52,441,330	55,063,397	57,816,566	60,707,395	63,742,764	66,929,903
Other current assets	35,517,214	35,766,227	33,728,584	35,415,013	37,185,764	39,045,052	40,997,305	43,047,170
Other banking financial assets	93,621,151	14,660,286	29,456,513	30,929,339	32,475,806	34,099,596	35,804,576	37,594,804
Cash and cash equivalents	422,717,478	442,995,724	518,180,171	544,089,180	571,293,639	599,858,320	629,851,236	661,343,798
Non-current assets held for sale	-	805,675	2,139,065	2,246,018	2,358,319	2,476,235	2,600,047	2,730,049
Total current assets	**746,326,549**	**778,776,065**	**910,588,275**	**956,117,689**	**1,003,923,573**	**1,054,119,752**	**1,106,825,739**	**1,162,167,026**
Total assets	**1,854,469,655**	**2,513,440,904**	**2,894,902,626**	**3,039,647,757**	**3,191,630,145**	**3,351,211,652**	**3,518,772,235**	**3,694,710,847**
EQUITY AND LIABILITIES								
Equity								
Share capital	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000
Own shares	-8	-8	-8	-8	-8	-8	-8	-8
Reserves	65,836,875	65,852,595	65,919,935	73,111,877	73,111,877	87,367,016	95,033,499	103,083,306
Retained earnings	4,378,984	10,867,301	39,962,419	44,322,366	44,322,366	52,964,210	57,611,836	62,491,844
Other changes in equity	-30,993,430	-49,744,144	-47,600,236	-52,793,477	-52,793,477	-63,086,994	-68,622,898	-74,435,597
Net profit	21,499,271	29,196,933	16,669,309	18,487,950	18,487,950	22,092,676	24,031,316	26,066,887
Equity attributable to equity holders	**135,721,692**	**131,172,677**	**149,951,419**	**158,128,707**	**166,035,143**	**174,336,900**	**183,053,745**	**192,206,432**
Non-controlling interests	165,494	242,255	323,675	339,859	356,852	374,694	393,429	413,100
Total equity	**135,887,186**	**131,414,932**	**150,275,094**	**157,788,849**	**165,678,291**	**173,962,206**	**182,660,316**	**191,793,332**
Liabilities								
Non-current liabilities								
Accounts payable	-	-	-	-	-	-	-	-
Medium and long term debt	100,282,203	148,597,934	164,034,127	172,235,833	180,847,625	189,890,006	199,384,507	209,353,732
Employee benefits	244,562,078	267,286,679	264,369,292	277,587,757	291,467,144	306,040,502	321,342,527	337,409,653
Provisions	16,019,339	17,635,379	17,416,354	18,287,172	19,201,530	20,161,607	21,169,687	22,228,171
Deferrals	305,691	29,449	283,289	297,453	312,326	327,942	344,340	361,557
Other banking financial liabilites	-	76,060,295	44,506,988	46,732,337	49,068,954	51,522,402	54,098,522	56,803,448
Deferred tax liabilities	3,108,662	2,958,115	2,793,698	2,933,383	3,080,052	3,234,055	3,395,757	3,565,545
Total non-current liabilities	**364,277,973**	**512,832,892**	**493,403,748**	**518,073,935**	**543,977,632**	**571,176,514**	**599,735,339**	**629,722,106**
Current liabilities								
Accounts payable	322,276,222	373,790,665	375,562,902	394,341,047	414,058,099	434,761,004	456,499,055	479,324,007
Banking clients' deposits and other loans	883,950,534	1,321,418,042	1,688,465,160	1,772,888,418	1,861,532,839	1,954,609,481	2,052,339,955	2,154,956,953
Shareholders	-	-	-	-	-	-	-	-
Employee benefits	17,119,105	19,416,212	18,630,568	19,562,096	20,540,201	21,567,211	22,645,572	23,777,850
Income taxes payable	-	5,958,753	1,340,420	1,407,441	1,477,813	1,551,704	1,629,289	1,710,753
Short term debt	27,096,073	26,813,567	42,832,626	44,974,257	47,222,970	49,584,119	52,063,325	54,666,491
Deferrals	2,708,090	3,454,477	3,412,059	3,582,662	3,761,795	3,949,885	4,147,379	4,354,748
Other current liabilities	86,203,693	100,353,646	99,493,397	104,468,067	109,691,470	115,176,044	120,934,846	126,981,588
Other banking financial liabilities	14,950,779	17,987,719	21,486,652	22,560,985	23,689,034	24,873,486	26,117,160	27,423,018
Total current liabilities	**1,354,304,496**	**1,869,193,080**	**2,251,223,784**	**2,363,784,973**	**2,481,974,222**	**2,606,072,933**	**2,736,376,580**	**2,873,195,409**
Total liabilities	**1,718,582,469**	**2,382,025,972**	**2,744,627,532**	**2,881,858,909**	**3,025,951,854**	**3,177,249,447**	**3,336,111,919**	**3,502,917,515**
Total equity and liabilities	**1,854,469,655**	**2,513,440,904**	**2,894,902,626**	**3,039,647,757**	**3,191,630,145**	**3,351,211,652**	**3,518,772,235**	**3,694,710,847**

Source: CTT, 2019, 2020b, 2021 and own computations

Figure 9.3 - Consolidated Balance Sheet (Historical and Forecasted)

Annex D - Consolidated Income Statement

	31.12.2018	31.12.2019	31.12.2020	31.12.2021 EP	31.12.2022 EP	31.12.2023 EP	31.12.2024 EP	31.12.2025 EP
Sales and Services rendered	685,944,622	688,021,669	672,854,025	690,430,244	708,465,587	726,972,048	745,961,932	765,447,869
Financial margin	7,867,424	29,315,856	44,636,907	45,802,907	46,999,366	48,227,078	49,486,861	50,779,551
Other operating income	14,402,062	22,948,405	27,749,403	28,474,270	29,218,072	29,981,303	30,764,471	31,568,097
Total Revenues	**708,214,108**	**740,285,930**	**745,240,335**	**764,707,421**	**784,683,025**	**805,180,429**	**826,213,264**	**847,795,517**
Cost of sales	-13,896,222	-14,261,450	-19,218,064	-20,506,521	-21,941,440	-23,415,267	-24,951,284	-26,529,193
External suppliers and services	-229,468,821	-242,776,520	-256,144,789	-262,808,259	-269,307,475	-275,950,099	-282,808,549	-289,819,125
Staff costs	-353,611,793	-356,004,365	-342,488,107	-351,397,753	-360,087,776	-368,969,548	-378,139,899	-387,513,655
Impairment of accounts receivablee, net	-2,242,880	-7,800,406	-5,613,098	-5,759,120	-5,901,542	-6,047,107	-6,197,401	-6,351,030
Impairment of other financial banking assets	-197,743	-3,095,636	-8,916,969	-9,148,939	-9,375,191	-9,606,436	-9,845,194	-10,089,247
Provisions, net	-1,920,024	905,250	-853,298	-875,496	-897,147	-919,276	-942,123	-965,478
Depreciation/amortisation and impairment of investments, net	-56,705,242	-54,223,229	-62,135,823	-62,963,744	-63,593,034	-64,228,964	-64,871,253	-65,519,966
Earnings of other financial banking assets and liabilities	-	-	380,000	389,885	399,527	409,382	419,557	429,957
Other operating costs	-13,828,616	-16,233,140	-16,194,526	-16,615,818	-17,026,725	-17,446,699	-17,880,318	-18,323,556
Gains/losses on disposal of assets	9,251,708	488,912	451,469	463,214	474,669	486,377	498,465	510,822
	-662,619,634	-693,000,585	-710,733,205	729,222,551	747,256,134	765,687,637	784,717,999	804,170,470
Earnings before interest and taxes	**45,594,474**	**47,285,345**	**34,507,130**	**35,484,870**	**37,426,891**	**39,492,792**	**41,495,265**	**43,625,047**
Interest expensees	-9,705,026	-10,421,170	-9,660,185	-10,108,985	-10,578,635	-11,070,104	-11,584,407	-12,122,604
Interest Income	48,711	63,609	20,091	21,024	22,001	23,023	24,093	25,212
Gains/loses in subsidiary, associated companies and joint ventures	-795,935	-1,400,621	-1,741,529	-1,822,438	-1,907,106	-1,995,708	-2,088,426	-2,185,451
	-10,452,250	-11,758,182	-11,381,623	-11,910,398	-12,463,740	-13,042,789	-13,648,740	-14,282,843
Earnings before taxes	**35,142,224**	**35,527,163**	**23,125,507**	**23,574,472**	**24,963,151**	**26,450,003**	**27,846,525**	**29,342,204**
Income tax for the period	-13,621,962	-6,242,463	-6,358,973	-6,482,428	-6,864,282	-7,273,132	-7,657,142	-8,068,419
Net profit for the period	**21,520,262**	**29,284,700**	**16,766,534**	**17,092,044**	**18,098,869**	**19,176,871**	**20,189,383**	**21,273,785**
Net profit for the period attributable to:								
Equity holders	21,499,271	29,196,933	16,669,309	17,036,374	18,039,920	19,114,411	20,123,624	21,204,495
Non-controlling interests	20,990	87,767	97,225	55,737	59,020	62,535	65,837	69,373
Earnings per share:	**0.14**	**0.19**	**0.11**	**0.11**	**0.12**	**0.13**	**0.13**	**0.14**

Source: CTT, 2019, 2020b, 2021 and own computations

Figure 9.4 - Consolidated Income Statement (Historical and Forecasted)

Annex E - Beta Computation (Linear Regression of CTT stock vs PSI 20)

SUMMARY
OUTPUT

Regression Statistics	
Multiple R	0.50857284
R Square	0.258646334
Adjusted R Square	0.255783965
Standard Error	0.046388784
Observations	261

Weakly data from 31/12/2015 to 31/12/2020

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.194449411	0.194449411	90.36092159	1.4196E-18
Residual	259	0.557347098	0.002151919		
Total	260	0.751796508			

	Coefficients	*Standard Error*	*t Stat*	*P Value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.004562908	0.002872267	1.588608569	0.113368749	-0.001093061	0.010218877	-0.001093061	0.010218877
X Variable 1	0.970615956	0.102107372	9.505836186	1.4196E-18	0.769549635	1.171682276	0.769549635	1.171682276

Source: Yahoo Finance and own computations

Figure 9.5 - Beta Computation (Linear Regression of CTT stock vs PSI 20)

Annex F - Terminal Value

$$Terminal\ Value\ = \frac{FCFF_{n+1}}{(WACC - g_n)} = \frac{46.0 \times (1 + 1.5\%)}{(5.87\% - 1.5\%)} = 1068.5 \quad (32)$$

$$Discounted\ Terminal\ Value\ = \frac{1068.5}{(1 + 5.87\%)^5} = 803.4 \quad (33)$$

Annex G - Peers Description

Bpost

Bpost (short for Belgian Post Group) is the Belgian company responsible for the delivering national and international mail. It operates through two main segments, Mail and Retail Solutions (MRS) and Parcels and Logistics (P&L). Its headquarters are located in Brussels, Belgium.

Deutsche Post

The Deutsche Post AG, part of the Deutsche Post DHL Group, is a German multinational package delivery and supply chain company which is divided in segments such as Post-eCommerce-Parcel (PeP), Express, Global Forwarding, Freight, Supply Chain, and Corporate Center.

Poste Italiane

Poste Italiane S.p.A. is the Italian postal service provider, which offers integrated communication, postal savings products, logistics, financial and insurance services. It operates through six main segments, Mail, Parcels and Distribution, Payments, Mobile and Digital, Financial Services and Insurance Services.

PostNL

PostNL is a mail, parcel and e-commerce corporation that operates as the provider of universal delivery in the Netherlands and is present in several European countries as an e-commerce solution.

Royal Mail Group

Royal Mail Group Plc is a British multinational postal service and courier company which operates in two main segments, Royal Mail and General Logistics Systems (GLS).

Annex H - Computation of CTT's share price target (per multiples)

P/E

Price Target = Average P/E × Earnings per share = 16.2 × 0.11 = € 1.78 (34)

EV/EBITDA

Enterprise Value =

= EBITDA × Average EV/EBITDA = 90,504,418 × 7.6 = € 687,833,576 (35)

Equity Value = Enterprise Value + Non-Operating Assets – Non-Operating Liabilities – Financial Debt = 687,833,576 + 142,499,452 - 403,604,959 - 91,656,672 = € 335,071,397 (36)

$$\text{Price Target} = \frac{Equity\ Value}{Number\ of\ Oustanding\ Shares} = \frac{€\ 335{,}071{,}397}{150{,}000{,}000} = € 2.23 \quad (37)$$