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Valuation of distressed companies: Case DIA Group

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ABSTRACT

This thesis presents a valuation model for distressed companies that uses traditional valuation methods which are adjusted to reflect the distressed nature of companies in decline. The model takes into account both distressed sale value and going concern value of the company which are then weighted with the probability of distress of the company, this is done to correct for the limitations of traditional valuation methods in distress situation. In the empirical part, we analyse Spanish grocery retailer DIA Group from both company and market perspective to come up with forecasts that drive the discounted cash flow model used in the going concern valuation part of the research. The model is applied into a company case to understand how distress situation affects company's value. Main findings for the thesis were that probability of distress that the model takes into account is one of the main differences when comparing to healthy company valuation. Another major difference was that company's cost of capital must be adjusted with the recovery of company's financials in the going concern valuation part when comparing to traditional discounted cash flow model where the discount rate is generally the same for the whole forecasting period and terminal value calculation. Our base case valuation implies that DIA Group's intrinsic value would be 0,83€ per share which implies to a 20% premium when comparing to the market price. In the latter part of the thesis, we did sensitivity analysis for our assumptions and found out that the model is most sensitive for changes in revenue growth, profitability and the propability of distress.

Keywords: Valuation, distress, decline, fundamental analysis, monte carlo simulations

INTRODUCTION

Value of an asset is relevant for many different interest groups, for investors, analysts, companies and executives. For management, the ultimate goal is to maximize shareholder value and the most important thing to understand is that what affects shareholder value and how the value is created. Valuation is more an art than a science, there are many traditional methods for valuation but many of them fail in non-ordinary situations such as distress, this is because most of them are designed for valuation of healthy companies. It is in human nature to be biased by optimism and in valuation, that usually shows in inflated growth rates and higher cash flows in the future, this creates the challenge for distressed company valuation, we have to understand the decline and accept it and also accept the fact that future cash flows of the company may be even lower than the cash flows of today (Damodaran, 2012). There are generally three different classes of companies which are in different part of their life cycle, the differences between them are generally related to growth and profitability, young companies are usually trying to survive their first years to become healthy businesses, after the start-up phase, companies usually begin their growth phase, this is the phase when companies are trying to grow as fast as possible and the biggest problem in valuation becomes forecasting the growth rate of cash flows. The last phase, which in general is the one that companies are trying to avoid is mature phase, in this phase, cash flows are not growing, they are declining or staying approximately the same. Uncertainty of cash flows is generally the highest during the start-up phase and in the mature or declining phase, when it comes to companies in decline, the challenges are magnified because of the worsening financial situation that usually leads to financial distress. (Grant, 2010)

This paper is a natural sequel after the research paper on core studies where we studied valuation of company that was still in its growth phase. The topic of valuation of distressed companies is also relevant as the research done in this field is way smaller in quantity than the research done in "healthy company" valuation. The objective of the study is to find out how companies in distress are valued, we are going to go through the valuation process step by step. The second objective of the study is to apply these methods into a real life case and find the intrinsic value of DIA Group using these methods. In the thesis, valuation of DIA Group is completed with the help of

theoretical and empirical framework that is set at the beginning of the thesis, research question that this paper aims to answer are the following, “What is the intrinsic value of DIA Group?”, “How distressed firm valuation differs from normal company valuation? “ and “What kind of effect distress has on company’s cost of capital?” . The study itself is divided into three parts, first is the theoretical framework where the concept of distress and traditional valuation methods are discussed. Second is the empirical framework where a valuation model is presented which takes into account the issues that affect the valuation of distressed company. The third is empirical case study of DIA Group where the empirical framework or model is put into practice and the intrinsic value of the company is obtained.

1. THEORETICAL FRAMEWORK

The following section covers the basic theoretical framework used in valuation of distressed companies, also the nature of distress and decline is going to be discussed. The theoretical framework was conducted by gathering information from academic papers, articles and reliable online resources. In the first part we are going to briefly discuss the traditional valuation methods and in the latter part of the theoretical framework we are going to focus on nature of distress and how it affect businesses.

1.1. Traditional valuation methods

Valuation is essential part for every capital allocation decision, valuation can be used for many different reasons such as investment analysis or equity research. Traditional valuation methods have gained a lot of research interest and there is currently considerable amount of academic papers and studies on them. While there is also many models and approaches for valuation of distressed companies, this research is mainly going to use intrinsic valuation for valuation. In the following chapters, we are going to discuss traditional valuation methods.

Discounted cash flow (DCF) method derives value of a company from discounted value of its expected future cash flows (Koller, Goedhart, Wessels 2010). DCF method is widely used in both research and practise as it has been generally accepted as the most academically sound method for valuation (Damodaran, 2006). Major inputs that drive DCF model in addition to the future cash flow projections essential for DCF method are company's cost of capital and terminal growth rate. This makes the method prone to errors as even slight changes in the major inputs affect the valuation drastically. As with all valuation models, the quality of the inputs is essential for the method as with low quality inputs, the output will offer little or no value for the analysis. If correctly used, DCF method is a strong tool for valuation and also to analyze and test how different changes in inputs affect the valuation (Steiger, 2008).

As said, in financial theory, the focus is usually on the DCF method which is intrinsic valuation method. Discounted cash flow method is highly sensitive to many assumptions and therefore relative valuation is used to complement DCF model (Lie and Lie, 2002). Most popular multiples are EV/EBITDA (Enterprise value to earnings before interests, depreciation and amortization) and P/E (Price to earnings) (Fabozzi et al. 2017). Peer group or comparable companies are usually used as a proxy for relative valuation and usually the median of the peer group multiple is used. Valuation based on multiples tends to be simpler than valuation done with DCF method as with DCF, one has to think about growth and riskiness of cash flows, in multiples valuation, these matters can be overlooked which leaves room for manipulations (Damodaran 2002).

1.2. Decline and distress

Mature and declining companies are usually relatively easy companies to value, as they have long established history and historic data available. Also the industries in which they operate have been already established and the actors in the market are identified, the competitive advantage and company's strategy is easier to evaluate. Additionally, their capital structures are stable and investment policies are already set so that they do not offer such pleasant or unpleasent surprises as young companies often do. On the other hand, these attributes can hide away problems beneath the surface, the policies that have been set and followed for years can be wrong and companies could actually invest more or less than it should invest. The importance of good management increases when company is declining, this is because able management will not fight the decline, they will rather adapt to it and sell or shut down the units and assets that are loss making, the best scenario being that the company will be able to sell the bad parts of the business and to become healthy again (Damodaran, 2015). When discussing decline and distress, one has to understand the difference, company can be in decline without being in distress and vice versa but these two concepts tend to go hand in hand (Afflerbach Ruiz, 2017). In the following chapters we are going to discuss and define the charasteristics of both becline and distress.

Generally, companies in decline share the following characteristics (Damodaran, 2009):

Stagnant or declining revenues: One of the most common characteristic is the fact that company in decline cannot increase its revenues even if the macroeconomic conditions would be favourable. One of the most telling feature of operational weakness is if the company cannot grow its revenues faster than the inflation rate in the economy. The more difficult type of revenue decline is sector wide decline as it eliminates the possibility of changing management and strategy to tackle the decline.

Shrinking or negative margins: Declining revenues are usually also accompanied by worsening margins as declining companies are usually also losing their pricing power, companies lose their pricing power usually because they lower their prices to stay competitive versus their main competitors. This results in lower margins as many times companies have quite large fixed cost base so lower revenues decline the margins.

Assets divestitures: One of the characteristics of declining companies is that sometimes the assets are worth more to other companies who can put the assets to better use than for the declining company. This also supports the fact that asset divestitures are more frequent for declining or mature companies than for young and growing companies. One reason for diverstitures can also be liquidity reasons as declining companies may have substantial debt obligations so the need for divestiture is stronger to avoid default.

Big payouts: Declining companies have less opportunities for growth investments which create value for shareholders, also as earlier mentioned, declining companies have more frequent asset divestitures which also bring cash inflow. If company is not heavily in debt, declining companies usually allocate large amounts of cash for dividend payouts or stock buybacks. Large dividends for declining company are generally positive for shareholders as they can then allocate the cash coming from dividends to investments which generate more value.

Financial leverage: Many times companies have acquired substantial amount of debt at their growth/healthy face and when company enters decline phase with stagnant and declining earnings and hardly any potential of future growth, they face debt burdens that are overwhelming. In addition to problems with existing debt, refinancing of the debt becomes harder and often more expensive as lenders will demand more stringent terms on declining company.

Declining company may have all of the mentioned characteristics or just few, decline also has many phases and usually for example the problems with leverage do not come up first when companies enter decline phase. In general, the longer company is in decline, the more financial the response will be, meaning that in the early phase of the decline, the responses for declining revenues and margins can be strategic. In Michael Porter's seminal work "Competitive strategy" from 1980, Porter came up with a framework which he refers to as "End-game strategies" in declining industries (Porter, 1980, 1983). These strategies introduced in the work were leadership, niche, harvest and quick divestment.

In leadership strategy, aim is to achieve a leadership position by trying to reach above-average profitability and become one of the last companies remaining in an industry, this strategy is especially for industries that are in decline. In niche strategy, company focuses on specific segment within the declining industry that is still profitable and decaying slower than the more broad industry, this strategy is usually done through the abandonment of other segments. Harvesting strategy focuses on optimization of cash flow, this can be done through investment cuts, reducing maintenance, cutting research and development or marketing costs, eventually, this business is liquidated. The final strategy for declining company is to make a quick divestment and exit. This strategy assumes that the maximum return achievable comes with early sale and exit. In this research, the focus is on companies that can still be turned around and operated as going concern (Hrdy, Simek 2012), (Houlihan and Lokey (2011).

Decline and distress are two different concepts, company can be declining without being in distress and company can be in distress without declining. There are also two different concepts for distress, economic and financial distress. Economic distress happens when net present value of the business as going concern is less than the total value of its assets (Crystal, Mokal, 2006). This means that the business is not viable and is economically distressed. The long the assets such as machinery and intellectual property are used in the current business, the more money will be lost by parties that have claims against the company. The best outcome from the claimants point of view would be that the company would sell the property at market value. However, usually, distressed company's property is sold in an insolvent liquidation which is also known as

liquidation fire sale, in such fire sale, only the liquidation value can be obtained out of the property and usually liquidation value is lower than the market value for the property (Pinto Et al).

Financial distress means that company is cash-flow insolvent and that it cannot pay its debt as they arise. When in financial distress, company is still economically viable and also the assets of the company might still be in their highest value while in use. As company is cash-flow insolvent, it also means that the property of the company is illiquid and cannot be sold quickly to finance its debt, also company's capital structure is in such shape that it is unable to meet its liabilities. Business that is only in financial distress can be valued as going concern as its assets are more valuable if kept together than they would be if sold off in fire sale, this is called going concern surplus (Moyer, Martin 2012)

1.3. Valuation of distressed companies

Valuation of businesses is a difficult task even if the company is financially healthy, even more complexities arise when the business under valuation is financially distressed. Most of the traditional valuation methods, both intrinsic and relative are built for valuation of healthy companies with positive growth. The valuation model used in the research is based on both going concern value and distress sale value, the weights of the two value approaches are determined by the probability of distress for the company. The model equation is the following (Damodaran, 2006):

(1)

$$Firm\ value = Going\ concern\ value * (1 - probability\ of\ default) + Distress\ sale\ value * probability\ of\ default$$

In the following chapters, we are going to discuss and show how to derive the inputs needed for the final firm value equation.

1.3.1. DCF Valuation for distressed companies

As earlier said, discounted cash flow model is based on present value of expected cash flows that company produces over its lifetime. The model does not change when using it for distressed companies but there are few problems that can lead to errors in the valuation.

One of the problems is that company's existing assets might be earning less than the company's cost of capital, this yields a value less than the capital invested in the company when the cash flows are discounted to present. If existing assets are currently earning less than company's cost of capital, it means that the logical response would be to divest these assets and hope that the company buying the asset would pay a higher price for it. This would make sense in a situation where company is in economic distress and the assets would be worth more outside the current use and therefore, the market price would be higher than the value in current use. However, diversititures create discountinuities in the past data that makes forecasting the future harder. For example operational numbers, growth, margins, capital expenditure numbers would be skewed, also parameters such as beta would change as they use historical data for prices and returns (Damodaran, 2009). Divestiture by itself doesn't affect value but the amount received from these divested assets can affect it.

Another problem is related to discount rate, there are few things to note when dealing with it in distressed company valuation. First is that, as earlier mentioned, declining companies are usually characterized by large payouts in form of dividends and buybacks, this has an affect on the value of overall equity and for example debt ratios that are used in the computations. For example returning large amounts of cash to shareholders will have an immediate negative effect on market value of equity. Also if debt is not repaid proportionately, it means that debt ratio will increase and it affects the cost of capital calculations. Other affect of distress for discount rate is that the presence of distress will affect it and many times, negatively. Especially cost of debt will increase as risk of default increases as many times, credit ratings of distressed companies will drop to junk status. Cost of equity will also increase as debt to equity ratio goes higher because equity investors will see more volatility in the earnings (Buttignon 2015).

1.3.2. Projecting cash flows

As company is valued on going concern basis, the fundamental assumption under the valuation model is that company will manage to turn its operations around from decline and distress to profitability and growth. To understand what kind of profitability and growth the company can achieve, one has to analyze historical financials to be able to make an estimation. The most important operational metrics for the cash-flow projection are revenue growth, operating margin and tax rate. As usually, companies in decline have to restructure the business before coming healthy again, this has to be take into account in valuation also, companies might have stagnant or declining revenues in the first years of the forecasting period because of it before restructuring is completed and the growth will slowly pick up and reach historic averages. Most of financially distressed companies also face lowering margin levels, as company is valued as going concern, the operating margin is also assumed to increase back into industry average levels. Last important input into cash flow model is reinvestment rate, this is always different for different companies and industires. Because of distress situation, companies may try to halt capital expenditures for liquidity reasons and try to get higher utilization out of investments already made. Sometimes the lack of investments is also the reason for companys decline and distress, competing companies may have invested already and therefore the company has fallen out of the capital expenditure cycle.

1.3.3. Cost of capital

Cost of capital is one of the key assumptions in discounted cash flow valuation, it is the vehicle that is used to adjust for riskiness of the cash flows. Riskier companies tend to have higher cost of debt and equity than healthy companies. This is because as company has risk of going bankrupt, the borrowing rates climb and if the company is highly leveraged, the cost of equity should also be higher than for companies that have lower leverage although in the same industry. The adjustments to discount rate is just partial as company is expected to create cash flows to perpetuity. The discounted cash flow valuation method relies heavily on the assumption of terminal value, and therefore, the biggest risk of distress is that company will lose all future cash flow to perpetuity. On our model, discount rate is adjusted during the forecasting period as company is expected to revert back to healthy state. Company's capital structure is also expected to to change as it will deleverage from usually high leverage levels during distress period. This change is crucial in distressed company valuation as in normal discounted cash flow valuation, a single discount rate is usually selected to be used throughout the forecasting period and also in terminal value calculations, if for example we would apply the discount rate from year 1 of forecasting period to the whole model, it would not take into account the reversion back to healthy company, if we would use for example just healthy industry average cost of capital for the whole period it would not take into account the distress of the first years in the forecasting period (Damodaran, 2009).

The discount rate or cost of capital used in our model is based on normal weighted average cost of capital which is the the weighted average of cost of equity and cost of debt, therefore both have to be calculated (Pratt et al., 2014). For beta, we use unlevered beta and the current market debt to equity ratio for the company. For companies in distress, the normal regression beta is usually out dated and doesn't take into account the state and leverage of the company. Distressed companies stock prices usually fall and as a consequence levered market betas will be significantly higher than normal regression betas (Damodaran, 2000). To get companys market debt to equity ratio, we have to come up with values for both. The market value for equity is relatively easy to calculate from the market prices. The market value of debt is more difficult to derive since companies usually have substantial amount of non-traded debt. Usually, and also what is used in this study, the book value of debt in balance sheet is treated as single coupon bond. Coupon is equal to interest expenses, maturity is weighted average maturity of both long and short term debt and the cost of debt of the company is used as the rate for the calculation. Market value of debt is calculated as follows (Bodie et al., 2011):

(2)

$$Market\ value\ of\ debt = \text{Interest expense} * \frac{(1 - (\frac{1}{(1+r)^n})}{\text{r}} + \frac{Face\ value\ of\ debt}{(1+r)^n}$$

For levered beta, the industry average unlevered beta is multiplied by the market debt to equity ratio and adjusted for the tax shield. The beta is calculated as follows (Fernandez, 2003):

(3)

$$\beta = \beta unlevered * \big(1 + (1 - tax\ rate)\big) * (\frac{D}{E})$$

For cost of debt we are going to use default spread over risk free rate based on company's credit rating, the data for default spread is gathered from Damodaran's database. The after tax cost of debt calculation is calculated the following way (Ross et al., 2010):

(4)

$$Cost\ of\ debt = (Risk\ free\ rate + Default\ spread) * (1 - tax\ rate)$$

When both cost of equity and the after tax cost of debt are calculated, the number are plotted into weighted average cost of capital to derive the final cost of capital (Brealey et al., 2011):

(5)

$$WACC = \frac{D}{\text{D} + \text{E}} * Cost\ of\ debt + \frac{E}{\text{D} + \text{E}} * Cost\ of\ equity$$

1.3.4. Terminal value

Terminal value assumption is substantial part of discounted cash flow model, as we project that company is able to turnaround its operations to healthy state, we assume that company is able to produce cash flows to perpetuity. Because of this healthy condition assumption, we are not going to make any adjustments for the terminal value calculations, it would also be difficult to do in practice as the visibility even to the last year of the forecasting period year ten is already limited. The terminal value is calculated as follows (Damodaran, 2006):

(6)

$$Terminal\ value = \frac{FCFFt}{(\text{WACC} - \text{growth rate})}$$

In our situation, the FCFFt will be the FCFF of 11th year in our forecasting period (last year of forecasting period multiplied by long-term growth rate to get the 11th year cash flow). The growth rate is the growth rate that company can sustain from year ten to perpetuity.

1.3.5. Relative valuation for distressed companies

Relative valuation is difficult for companies in distress because it is hard to figure out a valuation multiple that would suit a company in distress as these situations differ widely from companies in healthy state. There are usually two different scenarios when valuing distressed or declining companies; one is that the company itself is performing poorly and other companies in the sector are healthy and growing, this situation is difficult as companies that are healthy deserve higher multiple than companies that are declining. The challenge in this kind of scenario lies in the fact that the amount of discount applied to distressed company multiples is hard to figure out and analysts often come up with rather arbitrary numbers. The other scenario is that we are valuing company that is operating in a business sector that is declining as a whole, in this situation, our choices of multiples become more limited as for example earnings based multiples cannot be used. Also in this situation we also have to consider how to adjust for the degree of decline in the company as usually there are better and worse performers also in a sector that is in decline, assessing which company is the strongest of the sector may prove to be difficult (Damodaran, 2009).

1.3.6. Liquidation value

In principal, distress is not the biggest problem for companies by itself, the fact that companies have to sell their assets, usually at discount to their fair value is the main negative. As companies in distress have also probability to go bankrupt, we also have to calculate the expected value we would get from company's assets in a liquidation fire sale. For the calculation of expected proceeds in the event of firesale, we have three main choices (Damodaran, 2006). First is that based on going concern valuation, we are going to apply a discount for the distress sale (obviously, it will be less than the full amount of value calculated in the discounted cash flow model for going concern). For an example, if the going concern discounted cash flow model would yield valuation of 500 million euros, we would assume that in liquidation sale, we would only receive 60% or 300 million euros of that value. The second method is to estimate the distress sale value by considering only the proceeds that are generated by the current asset mass as a perpetuity without any new investments. The third way is to apply a percentage out of book value of assets that would be received in a distress sale, the percentage would be set from the basis of distress sales that have already happened to relative companies preferably in the same industry, the logic is that if for example comparable company in same industry was able to sell their assets for 50% of book value, we would apply the same percentage for our calculation. The problem with the third is that sometimes there is no data available from such comparable distress sales making the approach difficult and rather arbitrary.

Overall, in case of liquidation, the loss for shareholders is considerable and the liquidation value is lower than the value obtained by going concern valuation. Liquidation proceeds are hard to estimate as it depends on the market and how they assess the true value of the assets. The assessment depends on the market cycle, asset specificity and also on the situation of the company (Afflerbach, 2014).

1.3.7. Probability of distress

One of the key inputs into the model used in the study is probability of distress. Cumulative probability of distress over the valuation period must be obtained to derive the final value for our valuation. For probability of distress, there are also three different ways to calculate or derive it. The first is more statistical one, in the method the company's size, leverage and profitability are related to the probability of distress. For example Altman's Z score is based on this and is one of the earliest studies done on the subjects, linear discriminant analysis alone doesn't provide us with the probability of company going bankrupt and one has to use probit a cole variant to arrive at the estimate (Damodaran, 2009).

The second option is based on company's bond rating, different bond rating companies have credit rates firms globally for many years and therefore have also data on the subject and assuming the rating agencies have not altered their standards on rating, we can use the default probabilities they have gathered as an input.

The third option is to derive the probability of default based on bond price, the idea is to discount the expected cash flows of company's bond at the riskfree rate of the bond. This approach is simple but the main flaw is that it doesn't take into account special features of bonds such as convertibility, second major flaw is that usually companies have many bonds outstanding at the same time. In this study, we are going to define the probability of distress from data that has been gathered by rating agency, at valuation part of research, we are also going to perform a sensitivity analysis to test how the final value differs with different default probabilities.

2. Case: DIA Group

In the following chapters, the theoretical framework that was introduced in the first part of the study is going to be implied into valuation of real company. Company under valuation is DIA Group which is a Spanish grocery retailer, in the first sections, DIA's business model is going to be discussed and different segments are introduced. We are also going to discuss the overall market development to figure out which kind of outside forces affect DIA's operational profitability and performance. In the last part, valuation is done with the help of the model introduced in the theoretical part.

2.1. Company overview

Distribuidora Internacional de Alimentacion SA (DIA SA) is a Spain-based retailer that operates through owned or franchised supermarkets. It focuses on sale of food products but also retails personal care, health and household products, furniture etc. It operates in Spain, Portugal, Argentina and Brazil and China with close to 7,400 stores. In Spain, the company has 4,875 stores, in Portugal 630, in Brazil 1115 and in Argentina 930. In 2017 its sales exceeded 10.3 billion euros, 56% of sales comes from Spain, 8% from Portugal, 20% from Brazil and 16% from Argentina. The company consists of two definable segments; Iberia and Emerging. With Iberia segment, company operates in Spain and Portugal, it is the number one discounter by market share in Spain, in Portugal, it is the third. In Argentina and Brazil where DIA operates with emerging segment, DIA is the number one discounter by market position. Its customer base is quite loyal; more than 75% of sales comes through DIA loyalty card. DIA has also high private label penetration; more than 50% of the products are private label. Over 60% of DIA's stores are franchised, one of the highest proportions of franchised stores within the food retail sector across Europe. This lowers net sales and gross margins, but allows for higher overall profitability and a more-efficient capital allocation (Combs et al., 2003).

DIA operates with multi-brand strategy and to better understand its operations, the brands/segments are described below.

Dia Market: This is the company's neighbourhood store model and its attempt to get as close as possible to shoppers, bringing them a wide range of products and an unbeatable quality-price trade-off. DIA Market stores have a floor area of 400 to 700 squaremeters and are readily adaptable to local requirements.

Fresh By Dia: DIA has been refining its strategic commitment to perishables at its Fresh by DIA format. The idea is to use this platform as the testing ground for turning the company into the specialist in fruit and vegetables. Fresh by DIA stores average 150 square metres. They stand out for their fruit, vegetable, meat and fish selections, complemented by a range of convenience products such as dairy products, refreshments and snacks.

DIA Maxi: DIA's largest store format, with a floor area of up to 1,000m2 and customer parking lots. Size requirements mean that these stores are usually located on city outskirts. At DIA Maxi stores consumers can shop for a huge variety of private label and Spanish branded products (around 3,500 SKUs).

La Plaza de DIA: Represents the concept of a traditional nearby family supermarket in which customers can complete the needs of their daily shopping with a wide range of products, with special importance given to fresh produce. This store provides daily solutions for consumers with a wide range which exceeds 5,000 product lines.

Max Descuento: Specialises in providing services to professionals and self-employed workers in the hotel, catering and food industry and to groups, with a range of over 4,000 product lines with formats which are suitable for the uses of this channel.

Clarel: Neighbourhood store for shoppers looking to buy health, beauty, household and personal care items. Clarel stores will retail around 6,000 SKUs. Clarel brand was born with acquisition of Schlecker stores in Spain and Portugal. These stores are in the process of being refurbished and rebranded.

El Árbol: With a network of over 400 stores, El Árbol has a strong presence in the regions of Castilla y León, Aragón, Asturias and Galicia. The stores are characterised by their specialisation in fresh products and assisted sales in meat, cold meats and fish.

Cada DIA: Targets smaller towns, particularly in rural areas. Under this formula, franchise holders can offer DIA products without having to transform their stores into full-blown DIA stores.

Minipreço: DIA operates under the Minipreço brand in Portugal. There are Minipreço stores in town and city centres and larger Minipreço stores in city outskirts. DIA's private-label products are on sale across the Minipreço store network.

Mais Perto: This is DIA's most rural store concept in Portugal and is equivalent to the Cada Dia store in Spain. These establishments are located in small towns and are all managed by the regional franchise operators.

Private label brands: DIA has a private label brand portfolio of approx. 8000 SKUs. DIA brand sells traditional product range; refrigerated products, drinks, paper products etc. Delicious brand is for gourmet products, Bonte is for perfume and personal hygiene, Basic Cosmetics for cosmetics products, Babysmile for products for babies and AS for pet care and food. Private label brands are approx. 50% of company's sales.

(DIA Group investor relations).

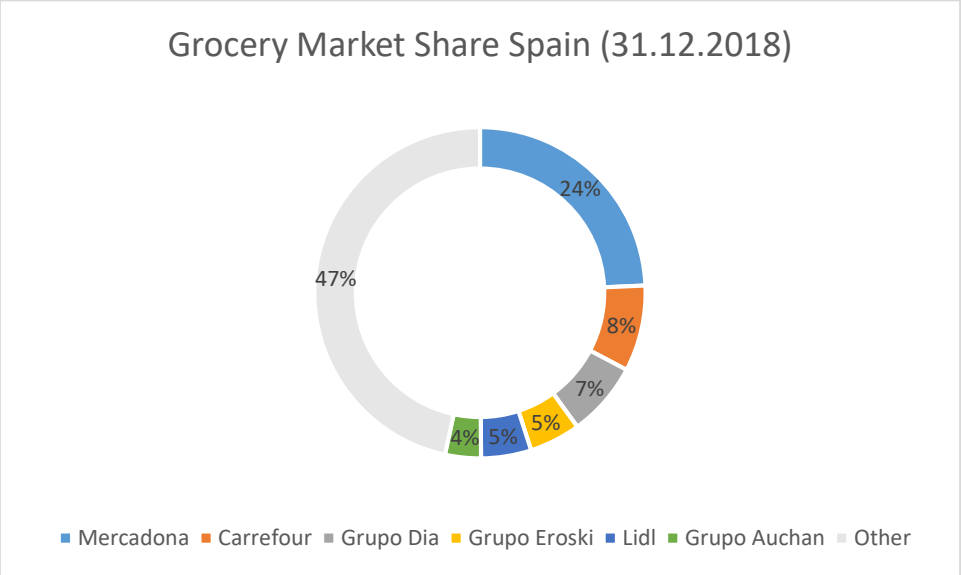

Figure 1 Grocery market share Spain (31.12.2018)

Source: Kantar World Panel, author

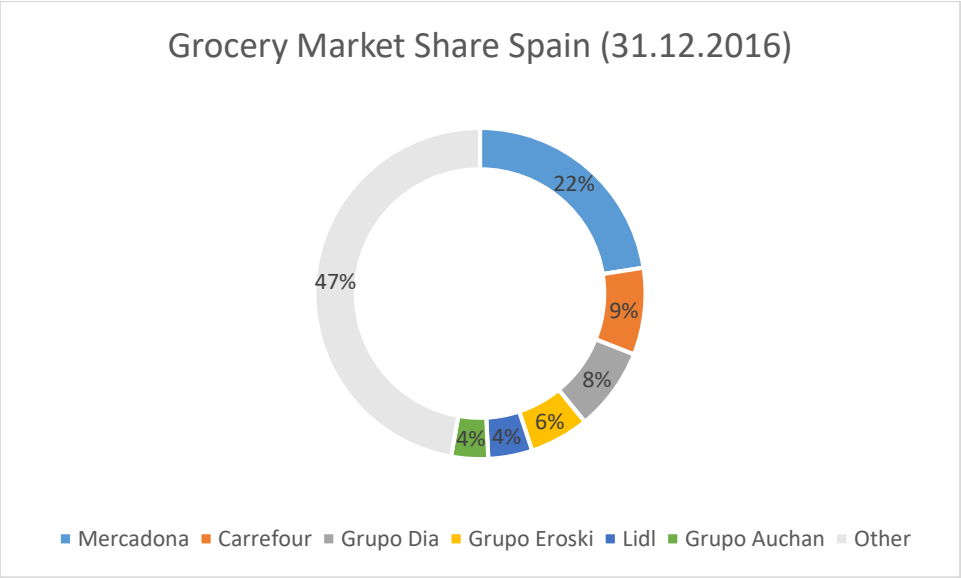

Figure 2 Grocery market share Spain (31.12.2016)

Source: Kantar World Panel, author

During the last few years, company has faced increasing competition in its home market Spain, it has lost almost two percent of its market share, same applies into the other Iberian country Portugal. In the Latin American region, DIA has been able to hold its market share but unfavourable currency development has put the business under pressure.

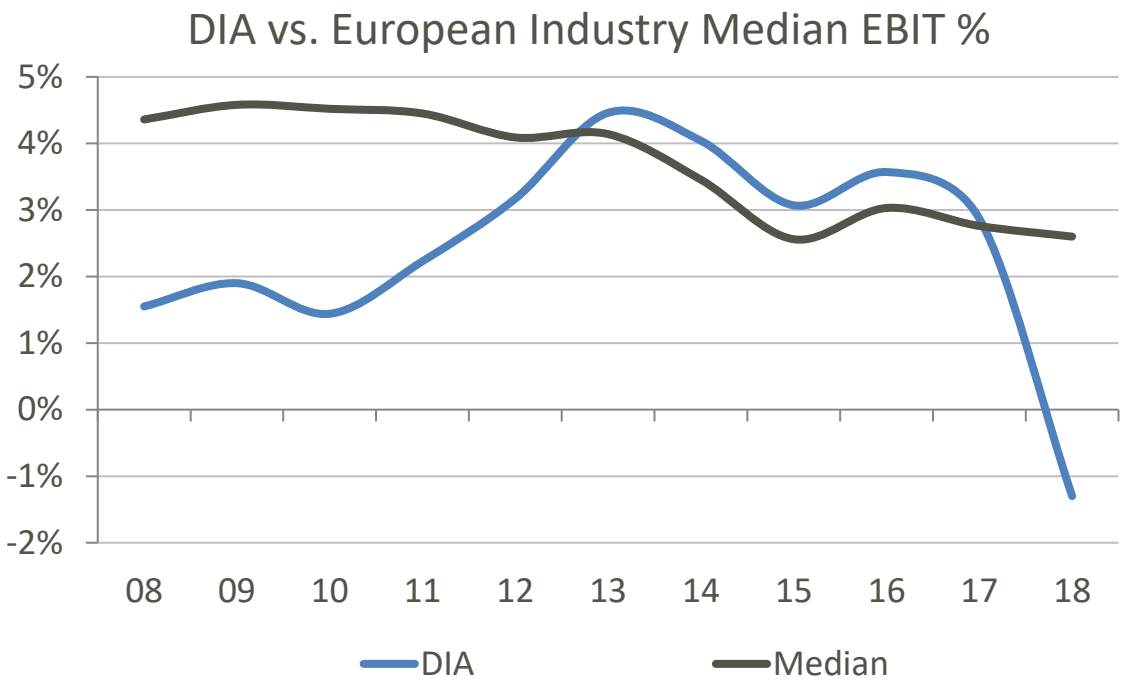

Figure 3 DIA vs. European industry median EBIT margin (%)

Source: Thomson Reuters Eikon, author

The increased competition in Iberia and unfavourable macro environment in Latin America lead to decreasing revenues, company's revenues have decreased from year 2016, largely because of this, the profitability has also been hit and has fallen from European median levels in 2013-2016 to negative territory in 2018. Company's net income was -352 million euros in 2018, this also took DIA's own equity to -166 million euros. Net debt has also increased from 660 million euros in 2013 to 1,4 billion euros in 2018.

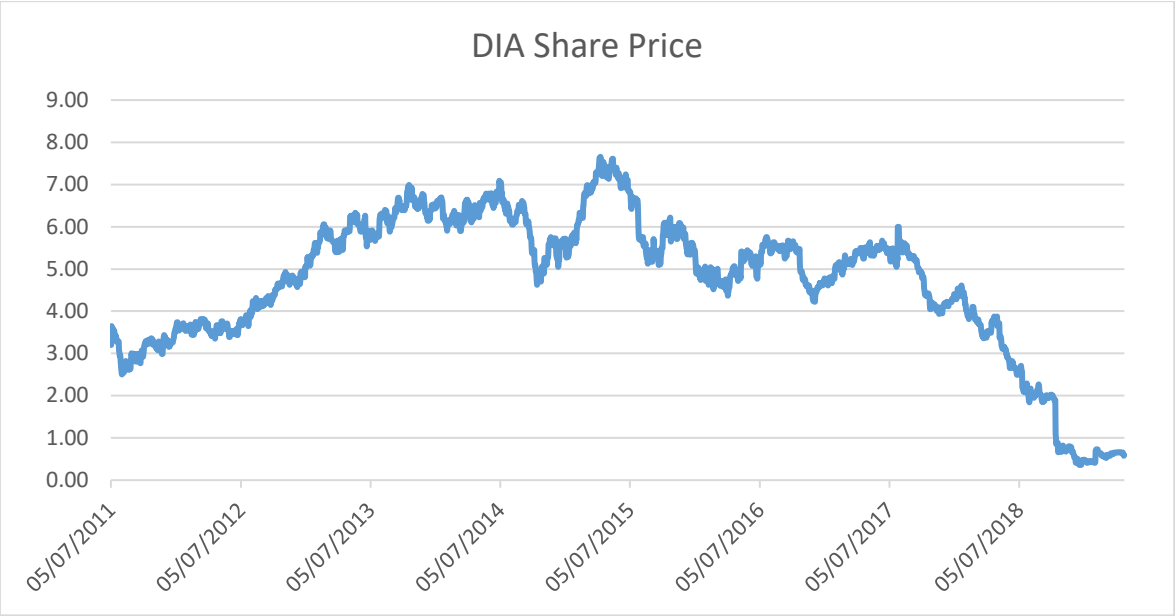

Figure 4 DIA share price performance 2011-2019

Source: Thomson Reuters Eikon, author

Company's largest shareholder is currently LetterOne investments which is a investment vehicle of Russian oligarch Mikhail Fridman, LetterOne currently holds 29% of the share capital.
In February 2019, DIA shareholders received a voluntary tender offer (OPA) from LetterOne: offering to buy all the 70%+ shares that they do not own at €0.67 which is conditional on the following: (1) approval from anti-trust authorities, (2) acceptance of VTO by at least ½ of the shares they do not already own (35%+), (3) no new equity issuance before the VTO is completed. The other available solution for shareholders is company's proposed €600m capital raise.

2.2. Market overview

According to Thomson Reuters, Spain GDP growth is expected to be little over 2% per year from 2018 to 2020. These positive outlooks are a consequence of the strength shown by the Spanish economy and the expectation of a favorable global environment, despite the rise in oil prices and the increase in uncertainty related to the political environment in Catalonia. Like other European food retailers that operate in Spain, such as Carrefour and Auchan, DIA faces intense price competition in the Spanish market from the market leader, Mercadona, which holds nearly a quarter of the market in terms of sales. Spanish consumer is generally really price sensitive, so it

drives price competition even more. Generally, in Spain supermarkets outperform hypermarkets as consumers seek convenience and proximity. This is beneficial for DIA because its market portfolio is tilted towards smaller convenience stores. Discounters are currently the only format in retail growing sales together with online. Retailers are investing extensively in their fresh ranges, counters and "price" image. DIA has also reacted to this bringing the Fresh by DIA brand into the market. Currently, DIA is number one discounter in Spain and third in whole food retail. Portugal's GDP is expected to grow approx. 0,5% slower than Spain per year, in December 2017, Portugal's credit rating was raised two levels to BBB by Fitch Ratings because of substantial improvement in financing conditions that is boosted by increased tourism and exports. Portuguese food retail market is also competitive as in Spain, the most influencial companies in the market are local players including Jeronimo Martins, whose Pingo Doce banner is the market leader in the supermarket channel, and Sonae MC, whose Continente leads the hypermarket channel and international retail players, including Auchan and Intermarché, discounters Aldi and Lidl, DIA and Coviran. DIA is number three by market share in "discounter category" and number 5 in food retail in Portugal (Kantar).

GDP of Brazil is expected to grow 1,5% in 2018 accelerating to 3% in 2020. After two years of negative growth, economic indicators show Brazil emerged from recession in 2017 when GDP grew 1%. 2018 is a presidential election year and political uncertainty remains, which has left the currency volatile. Fiscal adjustments and the political scheme will play a key role in future performance of the economy. This of course affects DIA's business as the reporting currency is Euro and 90% of debt is in EUR. The trend from hypermarkets to smaller markets is also happening in Brazil, in 2017 expenditures at supermarkets, neighborhood stores and cash & carry stores increased by 37 percent, 18 percent and 20 percent, respectively, while sales at hypermarkets fell by 14 percent. Analysts indicate rebounding consumer purchases would have had a greater impact on supermarket sales if food deflation had not been a factor (USDA, 2018).

Argentinian GDP growth is expected to be flat in 2018, growing by 1,5% in 2019 and by 3% in 2020. Argentina's peso depreciation has been fast and furious, Argentina has the same problem as does many other emerging countries, their currency is plummeting and most of the debt is in USD. Historically, the problem in Argentina has been that former populist governments have printed money to finance the budget deficits. Now, the new president Macri's government is trying to fix the damages. Finance Minister announced tax on exports, cutting the number of ministries, and reducing spending on public works projects and the government's payroll to regain investor

confidence. IMF increased its three-year lending program with Argentina by $7 billion to $57 billion, on the condition that the central bank halted full-scale interventions to support the falling peso. Additionally, Argentina was hit by worst drought in decades which impacted the harvest of soybeans and corn which are important for Argentina. Recently the exchange rate has depreciated significantly amidst declining confidence and capital flight. The authorities have reacted with higher interest rates, exchange rate interventions, an accelerated fiscal adjustment and negotiations with multilateral lenders. Inflation has rebounded due to hikes in administered prices, currency depreciation and higher inflation expectations. This limits household real income growth and, together with weather-related declines in agricultural output, will dent growth in 2018 (OECD). DIA is currently number one discounter in both Argentina and Brazil, number four food retailer in Argentina and number five food retailer in Brazil.

2.3. Going concern value

The implicit assumption when valuing companies as going concern is that the company valued is going to survive the distress. In DIA's case, as company is already in distress, we must project the road to recovery to become a healthy company once again. To analyse this, we must approximate the profitability that company like DIA could achieve when operating as "business as usual". To map out the path to recovery, and make the estimates for future, we look at the margin development DIA over the last five years and what kind of margins it has been able to produce.

Table 1. DIA's EBITDA margins 2013-2018

Year	Revenues	EBITDA	Margin
2008	8 239 800	361 700	4 %
2009	9 226 600	409 900	4 %
2010	9 588 000	430 300	4 %
2011	9 728 500	494 200	5 %
2012	9 707 600	577 000	6 %
2013	8 039 841	552 125	7 %
2014	8 116 217	525 594	6 %
2015	9 021 669	511 521	6 %
2016	8 795 455	560 929	6 %
2017	8 370 745	492 230	6 %
2018	7 432 621	273 811	4 %
Average			5 %

Source: DIA Group, author's calculations

As can be seen, in 2018, DIA had fundamentally different EBITDA margin than the previous 11-year average. Because of the implicit assumption of turnaround in the valuation based on going concern, we assume that DIA will have an EBITDA margin of 5% at the end of the forecasting period. Decline in margins and revenue is always because of more than one reason but the main reasons for DIA has been the attractiveness of some of its brands, mainly the larger store concepts. The demand for proximity grocery retail is on rise in Spain and labels such as DIA Maxi and La Plaza have been hit hard by increasing competition. DIA was also late into the capital expenditure cycle as the main competitors had already started to revamp their stores two years earlier than DIA started, this led to the fact that customers saw DIA's stores old and not appealing when comparing to stores of its competitors. The third, most obvious reason for the decline was the macroeconomic environment in company's Latin American businesses, both currencies, Argentinian Peso and Brazilian Real depreciated drastically during the year.

To project future results for DIA, revenue growth percentage will have to be estimated, we assume a 3% revenue reduction in 2019 due to further price reductions and temporary store closures for refurbishment in Iberia, in 2020 the revenue is expected to stay at the same levels than in 2019, for years 3-10, revenues are expected to grow 2% approximately at the rate of the market. In the emerging markets of Argentina and Brazil, broadly stable revenue growth in 2019 in local currency terms (however, reported revenue growth will remain closely linked to foreign-exchange rates as DIA's reporting currency is Euro), given positive like-for-like growth, improved space

contribution, and continued efficiency improvements, for years 2-5, we assume that it will grow 5% per annum and for years 5-10 3% per annum.

Table 2. DIA's revenue growth assumptions for the forecasting period (In thousands, €)

Year	Iberia growth	Iberia revenue	Emerging growth	Emerging revenue
1	-3 %	4761860	0 %	2379691
2	0 %	4761860	5 %	2498676
3	2 %	4857097	5 %	2623609
4	2 %	4954239	5 %	2754790
5	2 %	5053324	5 %	2892529
6	2 %	5154390	3 %	2979305
7	2 %	5257478	3 %	3068684
8	2 %	5362628	3 %	3160745
9	2 %	5469880	3 %	3255567
10	2 %	5579278	3 %	3353234

Source: Author's calculations

Table 3. Main assumptions for the forecasting period

Year	Revenue	EBITDA %	Growth rate in capital spending	Growth rate in depreciation	Working capital as % of revenue	Tax %
1	-2 %	2 %	-40 %	0 %	-10 %	-28 %
2	2 %	3 %	2 %	0 %	-10 %	-28 %
3	3 %	4 %	42 %	0 %	-10 %	-28 %
4	3 %	4 %	3 %	-20 %	-10 %	-28 %
5	3 %	4 %	3 %	-10 %	-10 %	-28 %
6	2 %	4 %	2 %	5 %	-10 %	-28 %
7	2 %	4 %	2 %	5 %	-10 %	-28 %
8	2 %	5 %	2 %	2 %	-10 %	-28 %
9	2 %	5 %	2 %	2 %	-10 %	-28 %
10	2 %	5 %	2 %	2 %	-10 %	-28 %

Source: Author's calculations

For capital expenditures, we assume that in 2019 and 2020, expenditures will drop to below 200€ million which is a significant reduction from the previous levels. This is because of substantial investments made in the recent years and the fact that company needs to improve its liquidity, capital expenditures are expected to return into historic average levels after the first two years of the forecasts, the normal level for DIA is approximately at 200 million euros, the capital expenditures are expected to peak at year 6 as it is expected that the new major investments for the turnaround are completed. One thing to note is also that capital expenditures are cut first in years 1 and 2 and after it depreciation drops in years 4 and 5. Net working capital is forecasted to stay at the historical average level of approximately -10% of sales, negative net working capital is natural for business such as DIA as it is not supplying goods with credit and is operating mainly as a cash only company.

Table 4. Main assumptions for the forecasting period (In thousands, €)

Year	NOPAT	Capital expenditures	Depreciation	Change in working capital	FCFF
1	-66510	155686	235206	2743	15753
2	-38659	158280	235206	12017	50285
3	19165	224421	235206	22237	52188
4	86541	231271	188165	23061	66496
5	106910	238376	169348	23919	61802
6	106223	244011	177816	18972	59000
7	105365	249785	186707	19439	61726
8	169724	255701	190441	19918	124382
9	174256	261763	194249	20410	127152
10	178914	267975	198134	20914	129986

Source: Author's calculations

The discount rate (costs of equity and capital) can be adjusted for the likelihood of distress. In particular, the beta used to estimate the cost of equity can be estimated using the updated debt to equity ratio, and the cost of debt can be increased to reflect the current default risk of the firm. The rate will not be the same throughout the forecasting period, it will have to be updated to reflect the improving situation of the company, for discount rate, weighted average cost of capital formula is used. For the calculation, we derive the debt to equity ratio, to come up with the ratio, market value of debt must be first calculated. In 2018, DIA had interest expense of 90m euros, face value of debt being almost 1,7b euros. DIA's debt had an estimated average maturity of debt of 1,7 years with estimated maturity of long-term debt of 2,3 years and short-term debt of 1 year. For cost of debt Damodaran's database is used, as DIA's credit rating was CCC+ at the time, database

suggests a 10% spread over the risk free rate, for risk free rate, Spanish 10 year government bond is used, it is currently yielding 1,1%. To conclude, we assume that the cost of debt for DIA Group is currently 11,1%, with tax rate of 28% this means after tax cost of debt of 8%. The implied interest rate for 2018 was 7%. For the market value of debt calculation, bond pricing formula is used.

Bond pricing formula derives the market value of debt which is approximately 1,5b euros. Market capitalization for equity part is simple to calculate, DIA has 622,5m shares outstanding currently, with current stock price of 0,62€, market capitalization comes to 385,8m euros at the time of this valuation. As we now have both the market value of debt and equity, we can derive the company's market debt to equity ratio which currently stands at 4x. At the moment, the average unlevered beta for European food and grocery retailers is 0,5 (Damodaran). From these calculated inputs, we can calculate the levered beta for the company.

$$0{,}5 * (1 + (1 - 0{,}28) * (4{,}0) = 1{,}94$$

As we now have all the necessary input for the WACC calculation, we can estimate the company's current cost of capital. Under these assumptions, the formula yields a discount rate of 9.7%.

For cost of equity, as a risk-free rate we use the same Spanish 10 year government bond which is currently yielding 1,1%. For beta, we use the levered beta calculated earlier and for equity risk premium we use Spanish ERP from Damodaran database accessed in March 2019.

$$1{,}1\% + 1{,}94 * 8{,}18\% = 17\%$$

As we now have all the inputs to weighted average cost of capital we can just plot the numbers into the equation.

$$(19\% * 17\%) + (81\% * 8\%) = 9{,}7\%$$

Table 5. Main assumptions for the cost of capital

Year	1	2	3	4	5	6	7	8	9	10
Tax rate	28 %	28 %	28 %	28 %	28 %	28 %	28 %	28 %	28 %	28 %
Beta	1,94	1,66	1,48	1,29	1,10	0,92	0,73	0,73	0,73	0,73
Cost of Equity	17 %	15 %	13 %	12 %	10 %	9 %	7 %	7 %	7 %	7 %
After tax cost of debt	8 %	8 %	7,50 %	7 %	6,50 %	6 %	5,11 %	5,11 %	5,11 %	5,11 %
Debt Ratio	401 %	323 %	271 %	220 %	168 %	116 %	64 %	64 %	64 %	64 %
Cost of Capital	9,8 %	9,6 %	9,0 %	8,5 %	7,9 %	7,2 %	6,3 %	6,3 %	6,3 %	6,3 %

Source: Author's calculations

Company is expected to make a turnaround and return to financially healthy state over the forecasting period, therefore, the levered beta is assumed to drop significantly as the debt to equity ratio is also decreasing. When FCFF and the terminal value are discounted to present we come up with an estimate of the value of the assets of approximately 2 billion euros as going concern. This valuation also holds the fundamental driver behind the model that company will be able to turnaround its business and become profitable. For the value of operating assets, we have to add the cash position company is currently holding which is 240 million euros and subtract the face value of debt which was approximately 1,7 billion euros. After these adjustments we arrive at value of equity of 417 million euros, company has currently 385 million shares outstanding so the equity value per share is 1,08 euros.

Value of the operating assets =	1 868 973
+ Cash	239 843
- Face value of debt	1 691 424
Equity value =	417 392
Diluted shares =	385 798
Equity value per share =	1,08€

With discounted cash flow model used to derive the going concern value we assigned 1,08€ per share to DIA's equity indicating approximately 60% upside when comparing to current market price of 0,67€ per share.

2.4. Liquidation value

For the second part of our valuation, we must derive the liquidation value of DIA's assets. As earlier mentioned, the liquidation value tells how much DIA would get from selling its assets today rather than the business as a going concern. Therefore, it makes more sense to price the assets rather than do a intrinsic valuation for them. This valuation represents the risk that investors are facing as we assume a distressed liquidation for the assets in the event of an default for DIA. For liquidation value, we use earning-power-of-assets approach which was introduced at the beginning of the paper. This approach is chosen because of lack of comparable distress sale transactions in the European market for hard discounters operating in grocery retail field such as DIA. For the approach we take the three year average operating income, which is approximately 144 million euros, we also assume that the tax rate will be 28% as it was in going concern valuation. For the discount rate, we take healthy industry weighted average cost of capital that was 6,2% (Damodaran).

$$\frac{\big(144\ 321 * (1 - 28\%)\big)}{6{,}2\%} = 1\ 675\ 986$$

For the estimate of distress sale proceed, we add cash (239 million euros) and subtract the debt outstanding (1,7 billion euros). After these adjustments, we come up with 224 million euros for the equity value or 0,58€ per share. The result is quite high when comparing to the market price, still, we argue that this is the best estimation of distress sale as there is no comparable distress sale data available to perform the liquidation valuation based on the other methods mentioned in the theoretical part of the research.

2.5. Probability of default

For probability of default, we use global corporate average cumulative default rates data from Standards & Poors (S&P). There are few limitations to this approach, the first being the fact that with this approach, the process of estimating probability of default is outsourced to rating agency, in this case S&P, the second limitation is that this approach also assumes that the rating standards do not change over time as for example the data used in this study has been gathered all the way from 1981. The third is the fact that the data measures the probability for company to default but doesn't necessarily measure the probability of going out of business, as earlier mentioned, default doesn't always mean that firms do not continue to operate as going concerns (Damodaran, 2009). As there are few limitations to this method earlier mentioned, we are also going to test the affect of changes in probability of distress with sensitivity analysis at the final valuation part of the study. At the end of 2018, S&P had assigned bond rating of CCC+ for DIA. Now using this information, we can look up the cumulative probability of default from the following table which is 50,71% over 10 years for the company.

Table 6. Global probability of default data

Global Corporate Average Cumulative Default Rates (1981-2017)

(%)

	--Time horizon (years)--														
Rating	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
AAA	0.00	0.03	0.13	0.24	0.35	0.46	0.51	0.60	0.65	0.71	0.74	0.77	0.80	0.86	0.93
AA	0.02	0.06	0.12	0.22	0.32	0.43	0.53	0.60	0.68	0.75	0.82	0.89	0.95	1.01	1.07
A	0.06	0.14	0.24	0.37	0.51	0.66	0.85	1.01	1.17	1.34	1.50	1.64	1.79	1.93	2.09
BBB	0.17	0.49	0.84	1.26	1.70	2.13	2.50	2.87	3.23	3.58	3.94	4.24	4.52	4.81	5.11
BB	0.68	2.13	3.83	5.53	7.11	8.57	9.81	10.92	11.90	12.77	13.49	14.14	14.72	15.24	15.80
B	3.59	8.25	12.26	15.44	17.88	19.88	21.48	22.76	23.90	24.95	25.84	26.53	27.15	27.75	28.34
CCC/C	26.82	36.03	41.03	43.97	46.22	47.13	48.33	49.23	50.08	50.71	51.20	51.71	52.34	52.82	52.82
Investment grade	0.10	0.26	0.45	0.68	0.92	1.17	1.40	1.61	1.82	2.03	2.23	2.40	2.57	2.73	2.91
Speculative grade	3.75	7.31	10.39	12.90	14.95	16.64	18.05	19.23	20.27	21.21	22.00	22.65	23.25	23.80	24.34
All rated	1.50	2.95	4.22	5.29	6.18	6.94	7.57	8.12	8.60	9.05	9.44	9.77	10.07	10.35	10.63

Source: Standard & Poor's

2.6. Valuation

Now, as all the necessary values needed for the valuation equation introduced at the beginning of the study are gathered, we can plot them to the equation. The estimated going concern value is 481 million euros, the liquidation value is 334 million euros and the estimated probability of default is 50,71%.

$$V = 417{,}4 * (1 - 0{,}5071) + 326 * 0{,}5071 \ = 319{,}5\ m\ €$$

The estimated enterprise value obtained by the model is 319,5 million euros or 0,83€ per share which is approximately 20% higher than the current market value of 0,69€ per share. Current market value represents the price that was offered by DIA's largest shareholder for the remaining shares of the company. Distressed targets are generally sold with a large discount comparing to healthy companies which are usually sold with premium (Faelten, Vitkova, 2014). According to the valuation, the discount is currently approximately 20%. As the probability of default and terminal growth rate are fundamental inputs for the final calculation, a sensitivity analysis is appropriate.

2.6.1 Sensitivity analysis

The going concern value which was calculated with discounted cash flow method includes many assumptions. As the assumptions are forecasts and more art than science, we must do sensitivity analysis on the most important inputs to get a range for the going concern value and to see how different inputs effect the valuation. On the following sensitivity analysis table, we see how long-term growth rate (which is used in terminal value calculation) and probability of default effect the going concern valuation:

Table 7. Sensitivity analysis table

		Probability of default				
	0,83	40,7%	45,7%	50,7%	55,7%	60,7%
Long term growth rate	2,0%	1,39	1,32	1,26	1,19	1,12
	1,5%	1,11	1,06	1,02	0,98	0,93
	1,0%	0,88	0,85	0,83	0,80	0,78
	0,8%	0,78	0,76	0,75	0,73	0,71
	0,5%	0,69	0,68	0,67	0,66	0,65

Source: Author's calculations

Based on the sensitivity table, the probability of default for DIA Group based on the current market price would be approximately 80%, we also see that the valuation is very sensitive to changes in long term growth rate as with 50,7% of probability of default and 2% long term growth rate, the value would be 1,26€ per share comparing to the same case with 0,5% growth rate which gives us valuation of 0,67€ per share.

2.6.2 Monte Carlo Simulation

Monte Carlo simulation is a method which can create multiple scenarios through random sampling. It was originally used in different fields but has also been adopted to use by finance industry. (Benninga 2014). In practice, one has to estimate distributions for some of the variables in the valuation model rather than use the plain base case that we have already calculated previously. For example, in the base case, we estimated that the EBITDA margins for the last 3 years of the forecasting period would be 5%, in the simulation, we estimate that the EBITDA margin will be for example normally distributed with expected value of 5% and standard deviation of 0,5%. We chose EBITDA margin for the simulation because of mainly one thing, as we can see from the table below, it has an substantial impact on the final equity value per share, this is for two reasons. First, and the more obvious one is that the cash flows in our going concern discounted cash flow model are going to be affected, the second, is that the profitability will affect the terminal value calculation. As terminal value is calculated from the last cash flow, it will have an impact as terminal value is a large part of the final going concern valuation. The other input we chose was revenue growth percentage which tends to correlate with EBITDA margins. We also included correlation coefficient of 0,4 between these two inputs as DIA's revenue growth and margin growth

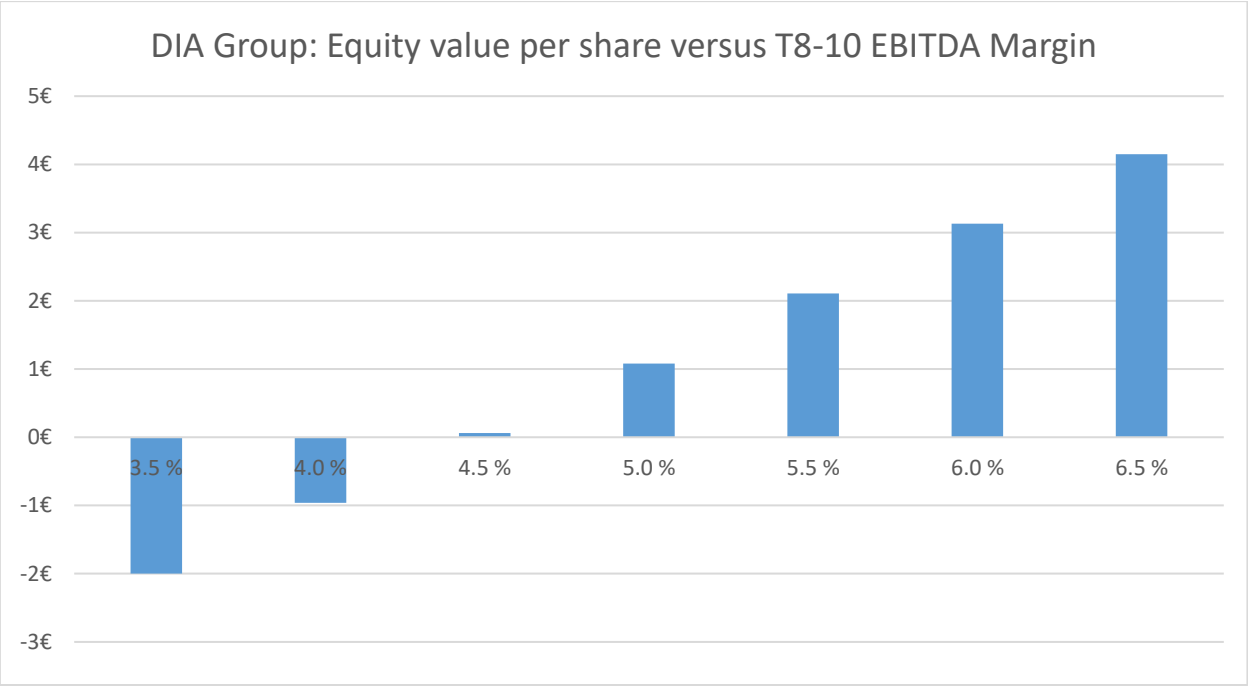

Figure 1. EBITDA Margin (Forecasted years 8-10) sensitivity to equity value per share

Source: Author's calculations

From the figure above, we can see that the equity value per share is highly sensitive to the EBITDA margin assumptions, with 3,5% and 4% EBITDA margin in years 8-10 in the forecasting period, the model gives us negative value (which is not possible), also 4,5% margin assumption gives us value that is lower than the current market price.

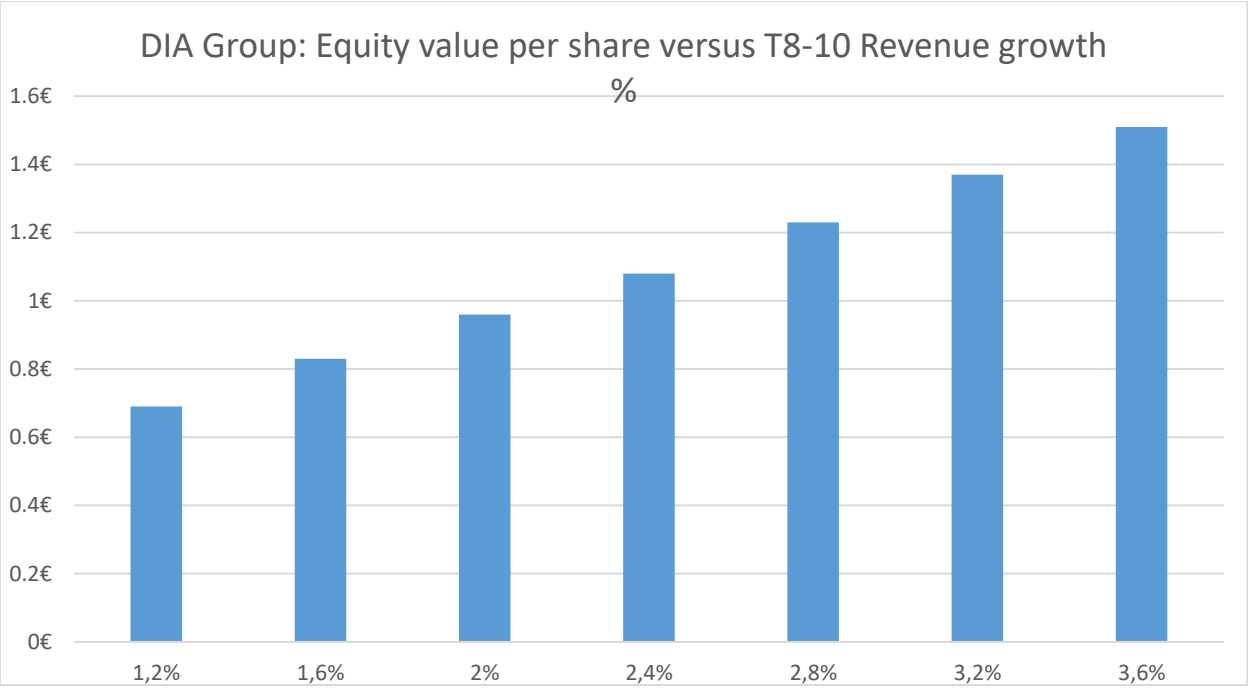

Figure 2. Revenue growth % (Forecasted years 8-10) sensitivity to equity value per share

Source: Author's calculations

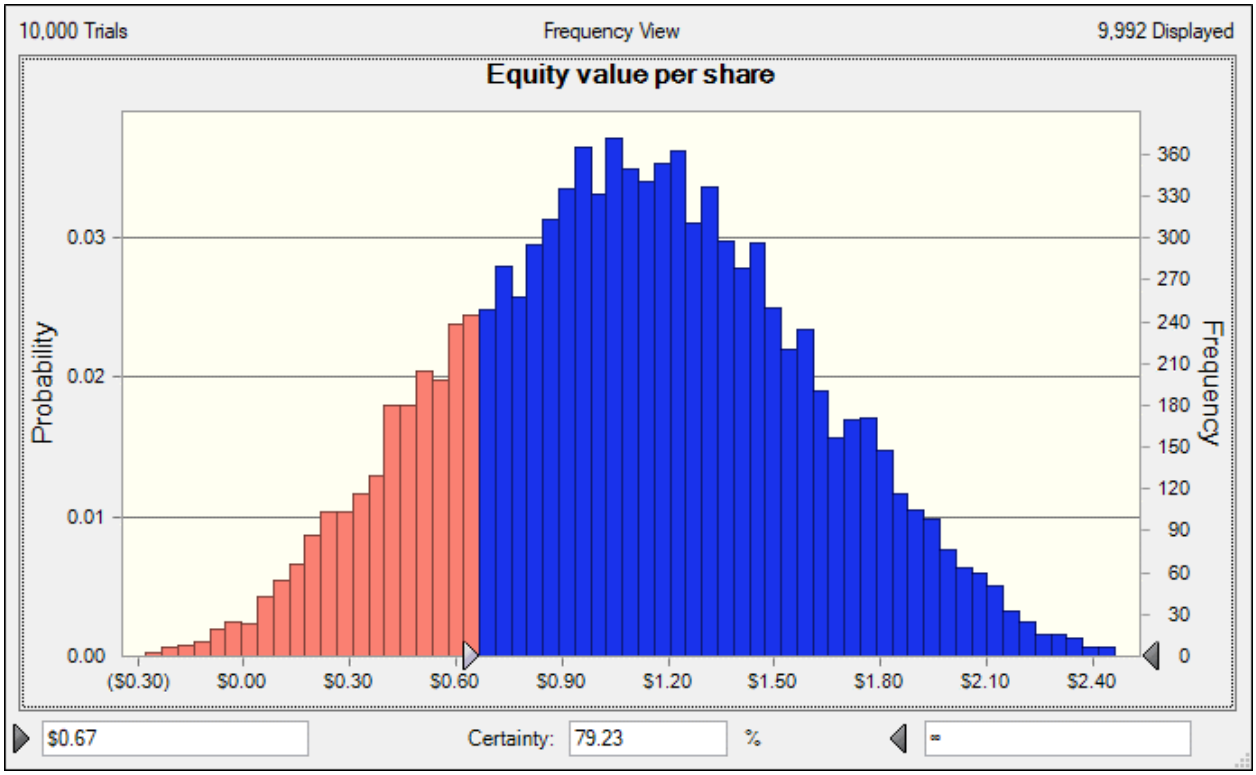

Figure 3. Simulation results for DIA Group Equity value per share

Source: Author's calculations

After 10 000 iterations, the mean value of the simulations was 1,07€ per share which was expected as it is very close to our base case. The standard deviation was 0,49€ and variance was 0,24€, minimum value was 0,37€ and maximum value 2,64€. The certainty for the equity value to be higher than the 0,67€ per share bid was approximately 80%. The sensitivity to EBITDA margin assumptions is the highest in the model, this means that according to our model, for DIA it is vital to reach the company's historic average margins to bring value for shareholders. To reach the margin target, DIA has to also grow its revenues to benefit from the operational leverage in the business.

CONCLUSION

Companies distressed differ from healthy companies which brings differences into valuation. Young companies and those which are in decline or distress poise the biggest challenges for valuators, this is mainly because of the fact that future of these companies is usually harder to forecast than future of healthy and growing companies. One of the research questions introduced at the beginning of the research was that how valuation of distressed companies differ from normal valuation. During the research, we found out that there are many differences between the two, traditional valuation methods ignore many major risks that these firms face, mainly the probability of default. Going concern valuation also differed from healthy company valuation as many of the inputs had to be changed during the forecasting period, this was because of the initial assumption in going concern valuation that the company is able to change the course and return back to healthy state. Other research question was "What kind of effect distress has on company's cost of capital?", initially, we saw that the often high leverage that distessed companies have has an increasing effect to cost of capital, also, the initial high cost of capital lowers during the forecasting period because of debt being payed down causing lower leverage in the business.

As the model was applied into real world case, it showed that the model, as every other valuation model, is really sensitive to changes in the inputs, therefore we made sensitivity analysis that involved the most important inputs that were driving the model. For final enterprise value derived from the model was 320 million euros, or 0,83 euros per share which implies a discount of approximately 20% when comparing to the market price. Consequently, the study concludes that the DIA Group share can be considered undervalued. Weakness for the study is that the model is sensitive for qualitative input variables and it doesn't bring solution for the lack of precision that is the nature of valuation. As shown in the end of the research with the sensitivity analysis, changes in the qualitative input variables lead to substantial changes in the final value. Although the model is sensitive for the qualitative inputs, it is more precise than the traditional valuation methods as it takes into account the nature of distressed companies.

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APPENDICES

Appendix 1. Perpetuity approach calculations

Perpetuity approach	
Normalized FCF in last forecast period (t)	129 986
Normalized FCF^{t+1}	131 286
Long term growth rate (g)	1%
Terminal value	2 472 695
Present value of terminal value	1 370 567
Present value of stage 1 cash flows	498 407
Enterprise value	**1 868 973**

Source: Author's calculations

Appendix 2. Fair value per share calculations

Fair value per share		
	Perpetuity	Liquidation
Enterprise value	1 868 973	1 675 986
Less: Net debt	-1 451 581	-1 451 581
Less: Trapped cash		
Equity value	**417 392**	**224 405**
Diluted shares	385 798	385 798
Equity value per share	**$1,08**	**$0,58**

Source: Author's calculations

Appendix 3. DIA Group historic income statement

Thousands of Euros	2013	2014	2015	2016	2017	2018
Sales	7,945,581	8,010,967	8,925,454	8,669,257	8,217,670	7,288,825
Other income	94,260	105,250	96,215	126,198	153,075	143,796
Revenues	**8,039,841**	**8,116,217**	**9,021,669**	**8,795,455**	**8,370,745**	**7,432,621**
	-		-	-	-	-
COGS	6,312,374	-6,350,654	7,018,881	6,767,370	6,520,434	5,817,011
Personnel expenses	-628,497	-704,940	-847,233	-833,643	-743,470	-713,370
Operating expenses	-549,847	-535,029	-644,034	-633,513	-614,611	-628,429
Amort, depr, imp	-190,452	-190,129	-225,039	-240,580	-223,719	-235,206
Disposal results	-7,636	-11,558	-12,340	-10,811	-50,544	-133,146
Operating profit	**354,037**	**323,907**	**274,142**	**309,538**	**217,967**	**-94,541**
Financial income	13,310	16,550	9,265	11,656	12,197	6,480
Financial expense	-46,209	-57,259	-65,291	-62,293	-65,687	-90,205
Gain from net monetary positions						67,505
Profit of companies, equity method	0	0	0	93	194	-1,183
EBT	**321,138**	**283,198**	**218,116**	**258,994**	**164,671**	**-111,944**
Income tax	-100,811	-74,556	82,610	-69,119	-52,013	-186,924
Net income from continuing operations	**220,327**	**208,642**	**300,726**	**189,875**	**112,658**	**-298,868**
Discontinued operations	-24,269	120,582	-1,477	-15,874	-11,490	-53,719
Net profit	**196,058**	**329,224**	**299,249**	**174,001**	**101,168**	**-352,587**

Appendix 4. DIA Group historic balance sheet

Thousands of Euros	2013	2014	2015	2016	2017	2018
PPE	1,601,651	1,270,356	1,372,010	1,469,078	1,410,739	1,268,600
Goodwill	454,388	464,642	558,063	557,818	553,129	492,765
Other intangible assets	45,613	32,567	34,763	37,505	43,492	47,297
Investments capitalized	787	0	92	185	380	9,182
Trade and other receivables	0	0	0	69,345	73,084	63,306
Other non-current financial assets	79,086	81,162	118,236	58,657	80,296	74,056
Non current tax assets					33,248	43,888
Consumer loans from financial activities	555	363	458	401	0	0
Deferred tax assets	57,667	147,890	271,480	270,164	272,349	73,346
Non-current assets	**2,239,747**	**1,996,980**	**2,355,102**	**2,463,153**	**2,466,717**	**2,072,440**
Inventories	544,867	553,119	562,489	669,592	609,004	531,664
Trade and other receivables	209,661	244,592	221,193	167,279	198,791	192,278
Consumer loans from financial activities	5,698	6,362	6,548	6,220	1,070	20
Current tax assets	77,651	64,347	69,474	71,087	57,847	38,030
Current income tax assets	0	42,593	49,663	8,832	3,525	10,143
Other current financial assets	10,714	12,144	15,718	19,734	9,896	11,302
Other assets	14,112	7,836	7,815	8,140	7,387	7,355
Cash and cash equivalents	262,037	199,004	154,267	364,600	346,516	239,843
Current assets	**1,124,740**	**1,129,997**	**1,087,167**	**1,315,484**	**1,234,036**	**1,030,635**
Non-current assets held for sale	6,100	10	0	0	39,604	168,738
TOTAL ASSETS	**3,370,587**	**3,126,987**	**3,442,269**	**3,778,637**	**3,740,357**	**3,271,813**
Share capital	65,107	65,107	62,246	62,246	62,246	62,246
Reserves	-41,491	65,098	87,323	261,108	244,256	246,701
Own shares	0	-58,864	-53,561	-66,571	-60,359	-55,861
Other own equity instrumetns	-10,510	22,827	11,647	21,013	10,773	6,820
Net profit for the period	209,259	329,229	299,221	174,043	101,208	-352,587
Translation difference	-37,909	-45,836	-93,683	-59,773	-100,777	-73,394
Value adjustments due to cash flow hedges	-820	55	50	92	-55	13
Shareholders' equity	**183,636**	**377,616**	**313,243**	**392,158**	**257,292**	**-166,062**
Non-controlling interests	0	-46	-18	-60	-100	0
TOTAL EQUITY	**183,636**	**377,570**	**313,225**	**392,098**	**257,192**	**-166,062**
Non-current borrowings	700,672	532,532	920,951	1,062,273	961,945	919,070
Provisions	72,570	86,100	51,503	45,841	44,057	45,908
Other non-current financial liabilities	8,245	7,539	17,906	2,785	2,491	2,291
Deferred tax liabilties	57,978	2,749	3,193	0	2,206	0
Non-current liabilities	**839,465**	**628,920**	**993,553**	**1,110,899**	**1,010,699**	**967,269**
Current borrowings	212,328	199,912	374,279	180,734	330,013	772,354
Trade and other payables	1,786,884	1,693,113	1,518,843	1,859,265	1,785,186	1,442,496
Current tax liabilities	141,837	82,440	92,939	85,494	89,927	74,338
Current income tax liabilities	18,702	8,747	4,111	15,505	7,571	664
Other current financial liabilities	156,679	136,189	145,679	134,642	207,657	157,647
Current liabilities	**2,316,430**	**2,120,401**	**2,135,851**	**2,275,640**	**2,420,354**	**2,447,499**
Liabilities directly associated with assets for sale	31,056	96	0	0	53,112	23,107
TOTAL LIABILITIES	**3,186,951**	**2,749,417**	**3,129,404**	**3,386,539**	**3,484,165**	**3,437,875**
TOTAL EQUITY AND LIABILTIES	**3,370,587**	**3,126,987**	**3,442,629**	**3,778,637**	**3,741,357**	**3,271,813**

Appendix 5. DIA Group historic cash flow statement

Thousands of Euros	2013	2014	2015	2016	2017	2018
EBT	**280,501**	**224,065**	**216,639**	**243,120**	**153,346**	**-167,179**
Adjustments to profit&loss	247,251	425,493	248,782	299,334	298,793	413,105
Amortisation	*187,450*	*190,129*	*225,039*	*240,580*	*223,719*	*235,206*
Impairment of non current assets					*12,053*	*79,937*
Impairment of trade debtors					*21,277*	*27,795*
Losses on disposals	*7,636*	*11,558*	*12,340*	*10,811*	*17,214*	*25,414*
Gains on disposals	*0*	*-103*	*0*	*-16,461*	*-31,226*	*-28,115*
Profit on the sale of subsidiaries					*0*	*-9,265*
Financial income	*-13,310*	*-16,447*	*-9,265*	*-11,656*	*-12,197*	*-6,480*
Financial expense	*46,209*	*57,259*	*65,291*	*62,293*	*65,687*	*90,205*
Changes of provisions	*-16,622*	*30,179*	*-40,374*	*832*	*1,318*	*-4,579*
Other adjustments of discont. op.	*0*	*0*	*0*	*8,291*	*15,826*	*9,879*
Other adjustments to P&L	*35,888*	*152,918*	*-4,249*	*4,737*	*-14,684*	*-8,075*
Profit/loss of companies by equity method	*0*	*0*	*0*	*-93*	*-194*	*1,183*
Adjustments to working capital	-63,534	-264,392	-214,148	285,464	-81,240	-386,719
Changes in trade and other receivables	*-33,748*	*-41,481*	*33,826*	*-30,661*	*-130,270*	*7,128*
Changes in inventories	*-22,739*	*-66,695*	*-9,370*	*-106,538*	*47,085*	*77,340*
Changes in trade and other payables	*80,756*	*-52,857*	*-177,697*	*431,251*	*27,038*	*-358,535*
Changes in consumer loan and refinancing	*227*	*-472*	*-281*	*-824*	*2,212*	*1,051*
Changes in other assets	*-6,779*	*-24,523*	*-5,111*	*-2,635*	*1,600*	*-19,903*
Changes in other liabilities	*5,161*	*-1,733*	*1,669*	*-4,510*	*-3,711*	*-23,659*
Changes in working capital of discont. op.	*0*	*0*	*0*	*5,443*	*2,538*	*-51,297*
Income tax paid	*-86,412*	*-76,631*	*-57,184*	*-6,062*	*-27,732*	*-18,844*
Cash flow from operating activities	464,218	385,166	251,273	827,918	370,899	-140,793
Acquisition of intangibles	-4,757	-2,322	-103,224	-5,491	-7,234	-6,151
Development cost	-8,107	-5,212	-4,911	-7,065	-11,167	-14,958
Acquisition of PPE	-337,890	-322,544	-436,936	-333,428	-262,195	-322,651
Acquisition of financial instruments	-8,670	-25,989	-29,229	-33,124	-25,794	-8,097
Disposals of PPE	1,835	656	2,854	38,302	68,204	93,892
Payments/Collections for other financial assets	45,778	285,914	15,218	2,220	-1,073	7,096
Interest received	11,130	6,974	6,243	8,342	2,045	3,322
Investing flows from disc. op	-49,180	-177,523	0	-1,034	3,596	-11,109
Cash flow from investing activities	-349,861	-240,046	-549,985	-331,278	-233,618	-258,656
Dividends paid	-83,865	-103,281	-112,614	-122,212	-128,535	-110,324
Acquisition of own shares	-45,749	-37,166	-200,055	-19,903	0	0
Loans repaid	-251,435	-534,158	-53,050	-376,598	-373,570	-225,141
Loans raised	230,000	519,942	598,224	300,000	405,556	646,874
Payments for other financial liabilities	-1,174	612	127	-6,484	-6,622	-2,660
Interest paid	-44,238	-47,905	-64,593	-61,797	-65,683	-83,606
Financing flows from disc. op	-11,145	-13,884	0	6,643	-33,491	0
Cash flow from financing activities	-207,606	-215,840	168,039	-280,351	-202,345	225,143
Net change in cash	-93,249	-70,720	-130,673	216,289	-65,064	-174,306