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**"VALUATION OF DISTRESSED FIRMS:**  
**THE CASE OF BIALETTI GROUP"**

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## **PREFACE**

In every economy, there are companies that are facing financial problems. Some of these firms can be even large corporations that account for a significant share of economic output and employment.

Going into financial crisis is quite a typical phenomenon for firms operating in a competitive environment. Furthermore, recent financial crisis and riskier corporate processes have made such phenomenon even more common and widespread.

Recognizing the crisis signals and intervene promptly is the best way to restore the normal going concern situation. However, this can be difficult because of the complex environment and business in which most firms operate.

When there is the necessity to evaluate distressed or declining firms, we should also consider that their future chances of survival are not fully predictable. Moreover, although thousands of valuation models and adaptations exist, there is growing evidence that these traditional methods fail to provide an accurate picture in certain scenarios characterized by volatile conditions and future uncertainty. In fact, most of the valuation techniques are built for healthy firms with stable growth prospects which do not work accurately when a firm is expected to shrink over time or where distress is imminent.

One of the initial issues that should be addressed in distressed firms valuation is whether the firm's value should be derived as a liquidation value or a going concern value. Generally, the appropriate method depends on the facts relevant to each specific case.

In addition, difficulties to value declining and distressed firms derive also from the risk the firms become unable to fulfill debt payments. This can create conflict of interests among debt holders, shareholders and managers, particularly through the measures that debt holders take to protect their interests. In fact, when companies are close to defaulting on their debt, shareholders will prefer to take out any cash rather than invest it in value creating opportunities. Shareholders may also prefer to invest in high-risk investments with short-term payoffs rather than in low-risk investments with long-term payoffs, even though the latter could generate more value.

Moreover, Gilson (1995) shows that corporate crisis situation can give rise to some distortions in the valuation process because of additional two reasons. The first reason concerns the fact that during a corporate crisis the amount and the quality of information available for an accu-

rate valuation is limited, considering also the low interest of analysts. The second reason, instead, is linked with the distorted use of corporate information by those with economic interests in the company to achieve their strategic purposes. For example, underestimating the enterprise value could benefit management and shareholders when they receive shares or options of the firm during a restructuring plan. At the same time underestimation of the firm's value could also benefit senior claimants who receive shares in exchange of debt. On the contrary, overestimating the enterprise value could benefit small shareholders and unsecured creditors.

The presence of all these elements together makes difficult the distressed firms valuation depending on uncertain results obtained from the different possible options used to manage the financial crisis.

Despite all these difficulties, an accurate valuation is particularly important for firms in decline and distress. Decisions about the future of the company and strategies such as refinancing, the sale of certain divisions or the whole company, raising new equity or the evaluation of liquidation are all dependent on accurate initial valuation. For this reason, the field has benefited from growing interest in practice as an alternative investment for actors such as hedge funds and private equity investors.

## CHAPTER 1 - Corporate crisis status

### 1.1. Introduction

Corporate crisis has always been considered one of the most important topics in corporate finance. Given the recent financial crisis, this phenomenon has become even more important both in literature and practice. The reason is related with the negative effects of the global recession on the international capital markets, which has inevitably made the corporate crisis phenomenon a subject of topical interest. In recent years, the increasing dynamics of markets and the greater competition among firms at the global level have been reflected in a higher level of corporate risk. On the other side, the likelihood of entering in a regressive path is part of the risk that characterized the life cycle of every firm operating in a complex economic environment. For this reason a crisis situation can be considered an expected phenomenon in the firm's life cycle, irrespective of the negative macroeconomics events.

A firm which faces a pathologic status during its life cycle most of times has to deal with a *solvency* situation. In these cases, the incapacity of the firm to meet contractual obligations gives rise to conflict of interests among creditors, management and shareholders. Furthermore, when a firm is in trouble the amount and the quality of information available for the valuation purposes is generally quite limited and it is often used improperly to meet the strategic objectives of individuals who are interested in the value of the firm. The presence of all these considerations together with the corporate complexity contributes to create distortions in valuation process. It is exactly from these considerations which derives the content of this thesis.

The aim of this chapter is to give a better understanding of what corporate crisis stand for and the difference between decline and distress. Then, we will analyze the main causes and the evolutionary stages of a corporate crisis. The causes of a corporate crisis will be classified considering their *objective* and *subjective* nature, the impact on the firm's economic and financial equilibrium and their *internal* or *external* matrix. With regard to the developmental stages of a crisis, the events that characterize the transition from *potential* to *reversible* crisis and, finally, to *irreversible* crisis are often difficult to distinguish. However, only after causes and evolutionary stages have been identified it is possible to diagnose the crisis status in order to promptly undertake the best strategy to manage and solve the crisis.

The chapter will conclude considering the main challenges related with the valuation of distressed and declining firms. In particular, the thesis will consider practical problems of traditional valuation models, uncertainty linked to strategic and structural factors and the analysts' optimism. Finally, distressed firm valuation cannot ignore the *probability of default* and the consideration of some issues about its calculation, *direct* and *indirect distress costs* as well as the concept and the calculation of *distress liquidation value*.

### 1.2. Corporate crisis concept and definition

Corporate crisis concept has extensively involved corporate finance literature since long time. As specified in the previous paragraph, corporate crisis is strictly linked with the dynamic evolution of a company that operate in a complex competitive environment and it is characterized by an alternation of successful and unsuccessful phases. So, a crisis can be considered either as a *pathological* status of a company characterized by uncertainty and malfunction or as a *physiological* status related to the dynamic evolution, which necessarily affect the firm's life cycle.

In both cases, a corporate crisis is a complex phenomenon and can be observed under different perspectives. Buttignon (2008) defines the crisis condition as a situation in which the business activity destroys economic value both for shareholders and other stakeholders. In this case, the firm is unable to fulfill existing debt obligations by using cash flows generated by the business activity or by issuing new debt.

Fazzini (2009), instead, identifies a corporate crisis as a pathological status in a specified period of the business life cycle, which occurs when there is a situation of financial imbalance that persists overtime and makes it difficult to restore the correct going concern situation. Similarly, Aldrighetti and Savaris (2008) consider a corporate crisis by making reference to a deterioration process of the corporate financial conditions which occur through an alteration of the economic and financial situation.

Anyway, whatever definition of corporate crisis we adopt it is sensible to distinguish a decline from a distress situation. In fact, not all declining firms are distressed nor all distressed firms are in decline, but in many cases distress and decline go hand in hand.

Generally, there are different stages in each of these conditions. The effects range from simple financial issues, such as cyclical liquidity problems, to severe and close-to-bankruptcy cases (Grant, 2010). The following paragraphs attempt to identify the major characteristics of firms in decline and distress that will be analyzed in this thesis.

### 1.2.1. Decline

Generally, companies in their growth stage constantly try to innovate to continue growing and to avoid becoming a mature company, while mature companies try to stretch their maturity as long as possible to avoid entering the declining stage.

The reasons for decline are numerous and normally decline is triggered by various factors occurring at the same time. A firm's decline normally begins with changing industry conditions such as the emergence of substitutes and technological innovation. In many cases, human factors, such as managerial errors, represent the causes for failing to innovate in new products and failing to anticipate the change in the market and in consumer behavior (Grant, 2010). In addition, external factors such as a bearish economy and depressed capital markets can aggravate the situation. All these factors will eventually affect the company's sales. Consequently, the drop in sales will result in both poor profit margins and falling cash flows.

Although not necessarily applicable to all cases, some of the main factors that accompany decline are the following (Damodaran, 2009).

1. *Stagnant or declining revenues.* One of the main signs of decline is the inability of the company to increase revenues over an extended period of time, even if market conditions are generally positive.
2. *Shrinking or negative margins.* In many cases the inability to increase revenues will result in declining or negative profit margins. This is a result of a loss of bargaining power and a reduction in the pricing level to prevent revenues from falling further.
3. *Big payouts (dividends and stock buybacks).* Declining firms have few growth investment opportunities, existing assets that may generate positive cash flows and asset divestitures that result in cash inflows. For this reason, if these firms do not have large debt payments to fulfill, they can use cash flows to pay out large dividends, sometimes exceeding their earnings, and also buy back stocks.
4. *Asset divestitures.* As debt burden of declining companies increases there is a strong pressure to divest assets to meet upcoming debt obligations. In addition, since the assets are not at their optimal use, a logical step is to sell these assets.
5. *Financial leverage.* With declining revenues and falling profit margins, a declining company faces great challenges to meet its liabilities. In addition, due to the higher risk, it is usually difficult for the firm to refinance its debt because the cost of borrowing capital will usually increase.
6. *Liquidity Constraints.* The reduction in revenues, combined with an increase in the net working capital level, will result in lower free cash flows and therefore reduce the liquidity of the firm.

As previously mentioned, there are several stages in a decline process. The first stage of decline is normally triggered by strategic issues. Since mature companies normally have a healthy cash position, at the beginning the company still has multiple options to act on the above mentioned issues. However, as these issues become more severe they increasingly affect the company's ability to take action. So, if the firm does not act promptly the main problems become financial, such as liquidity and leverage issues.

In general, the response to decline is both of strategic and financial nature. However, the longer the firm is in decline, the more financial the response will be (Grant, 2010).

### *1.2.2. Distress*

Distress comes to light when a firm is unable to recover from decline after a certain period of time. Overall, there are two different types of distress: *economic* and *financial distress*. A company in economic distress will eventually, if nothing changes, end up in financial distress. While a mature company still derives a significant part of its value from growth investments, a declining company obtains almost no value from its new investments. In many cases the company actually loses value from their growth investments due to investment return rate below the cost of capital of the company. In that case, the company's net present value as a going concern is lower than the total value of its assets. This means that the business is no longer viable or, as defined by the academic literature, it has become *economically distressed*. In this situation, assets are not at their highest value in use and it would be more beneficial for the company to close down its operations and divest its assets (Crystal and Mokal, 2006) (Damodaran, 2009).

This situation should not to be confused with *financial distress*. A firm that is financially distressed could be even profitable, but the distress comes from *insolvency*, i.e. illiquidity. In this case the firm encounters difficulties in meeting liabilities such as interest payments or other contractual obligations when they arise. Financial distress can have serious consequences, which are normally categorized as direct and indirect *costs of distress*. We will focus on the features of these costs in the paragraphs 1.6.2.

When firms are unable to meet their debt payments they are normally forced to liquidate their assets at bargain prices and use the proceeds to pay off debt. In this scenario it is very unlikely that there is any value left for the equity holders.

However, distress costs go beyond those costs associated with liquidation. The image of distress can seriously damage the firm's operations since employees, suppliers and lenders are more cautious in their relationship with the firm.



In fact, firms in distress situation have much higher employees turnover, lose more customers and face higher restrictions from suppliers than healthy firms. These indirect costs has a severe impact on the firm's value.

### *1.3. Causes of corporate crisis*

The timely identification of a corporate crisis status represents the first success factor for the definition and achievement of restoration strategies. Indeed, at the source of a corporate crisis there are a series of internal and external factors that operate jointly and determine a reduction in the competitive advantage of the company.

According to Buttignon (2008), the corporate crisis is the result of several phenomena, interconnected each other, that create vicious circles. Given the complexity of this phenomenon and its mechanisms, it is particularly difficult to determine what are the causes of a corporate crisis.

From a classification point of view, the causes of a corporate crisis fall into two categories: objective and subjective causes. *Objective causes* are those linked to financial and economic imbalances which can damage operating and economic going concern conditions of the firm. *Subjective causes* are those attributable to the firm's human capital. In this case, human behaviors can be seen as a unique source of success or failure. When adopting such approach, critics are first moved against management that is accused to be responsible of the firm's poor performance (for example, inefficient control of resources, wrong financial or distribution policies and strategic investment mistakes). Later, critics are moved against shareholders and debt holders for their poor availability to finance the company or to give warranties to creditors, excessive dividend payout, wrong management choice or inefficient organization. This approach, however, does not allow to investigate exhaustively the causes of the crisis because it does not considers external events which cannot be controlled by human capital of the firm. Analyzing the phenomenon from an objective point of view allows to identify the causes of a corporate crisis not only due to inefficiencies and human behaviors but also originated by external phenomena not controllable by management, such as a reduction in the global aggregate demand, price increase of raw materials or price competition on final products.

Based on this approach, we can distinguish five types of crisis which often present simultaneously (Damodaran, 2009).

1. *Crisis due to inefficiency*. It takes place when one or more firms in the same industry operate at returns lower than those of competitors. Generally, the crisis of inefficiency affect the operations area because of the obsolete technology and tools or poor use of

labor force. The diagnosis can be made comparing some efficiency indexes (such as number of hours worked per unit of output, the productive speed of particular machineries, the utilization rate of operations) with those of competitors. Inefficiency can also relate to commercial area, for discrepancies between cost and performance of marketing campaigns, or to the administrative and organization system, for lack of adequate instruments in strategic planning and control. Finally, inefficiencies can involve the financial area. In this case cost of capital of the firm is greater than that of competitors. This comes from lower bargaining power of the firm against the credit system, incompetence of CFO (Chief Financial Officer) and greater risk perceived for the business activity.

2. *Crisis due to overcapacity/rigidity.* In this case, crisis is related to an excess of productive capacity together with an adaptation rigidity due to the greater amount of fixed costs related to the business. The most frequent situations for this type of crisis are:
  - A durable demand reduction for the entire industry: this occurs when there is a change in consumers' behavior and needs, cheaper competitive products are launched in the market, high exit barriers and the search of even higher economies of scale increases the weight of fixed costs in the firm's structure.
  - A durable demand reduction due to market share shrinking: in this case the crisis affects the individual firm for its internal weaknesses and not the entire industry.
  - Sales growth rate is lower than that expected when fixed investments are made.
  - Cost increase is not offset by corresponding price increase, for example during periods of high inflation rate.
3. *Crisis due to product deterioration.* This crisis is originated by a gross margin contraction which makes it difficult to cover fixed costs leaving an insufficient level of profit. The causes might be related either to a loss in the product competitiveness or the entry of a new competitor or the achievement of maturity or decline stage in the product lifecycle.
4. *Crisis due to a lack of innovation and planning.* In this specific case, the firm is unable to adjust its activity to the external market conditions and changing environment. This is particularly visible on companies which focus their attention only on short term performance without planning future activities with a long run perspective. Lack of innovation takes place when the firm is unable to introduce new ideas, develop new products, search new markets or new ways to encourage customer loyalty. Indeed, it would be difficult for firms to maintain positive results overtime without the study of new growth opportunities.

5. *Crisis due to financial imbalances.* This occurs when there is a serious lack of shareholders' equity, high levels of debt (especially with a short term maturity) or insufficient liquidity reserves. The result is a poor bargaining power of the firm against credit institutions and difficulty to meet payment terms. This financial situation gives rise to interest payments higher than those of competitors, which can generate income losses and low competitiveness.

Often a financial imbalance is a consequence of other types of crisis and it contributes to worsen the economic difficulties of the firm as well as to accelerate the transition from a decline to distress condition.

Given the complexity and extent of corporate crisis phenomenon, in literature there are several classifications about causes and typologies of crisis, which can be obtained by observing this phenomenon under different perspectives. Even though every attempt to classify corporate crisis is not exhaustive because it involves several events, one possible classification can be the following.

1. *External matrix crisis.* In this case, the crisis involves the entire industry or the specific sector in which the company operates. In particular we can have:
  - Economic crisis linked to factors such as fall in demand, high unemployment or price increase of raw materials.
  - Ecologic crisis due to phenomena which damage the environment and, as a consequence, the business activity in which the firm operates.
  - Catastrophic crisis due to accidental events which damage the economy of a specific geographical area in which the firm operates.
2. *Internal matrix crisis.* In this case, the crisis is attributable to the strategic or organizational mistakes made by the firm's management. More precisely:
  - Strategic mistakes in the definition of the investment portfolio.
  - Wrong choices in the positioning, market segments or market niches to serve.
  - Dimension crisis due to excess or lack of resources.
  - Efficiency crisis due to imbalances between costs incurred and performance obtained.

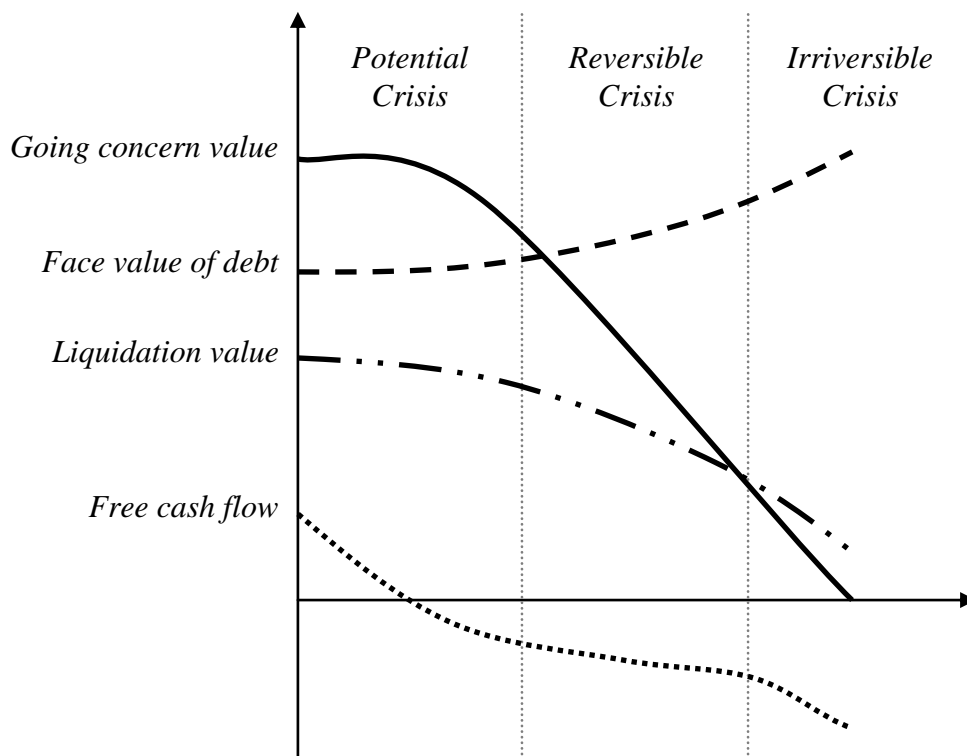
#### *1.4. Developmental stages of the crisis*

In the last paragraph we focused on the context in which the corporate crisis develops and the possible causes. Now our analysis focuses on the developmental stages of the crisis path.

For this purpose we report the following chart proposed by Buttignon (2008) in which we can observe the relationships existing among operating cash flows, enterprise value, debt value

and liquidation value in the three different stages of the crisis path: *potential crisis*, *reversible crisis* and *irreversible crisis*.

Figure 1.1. - A firm crisis path (Buttignon, 2008)



In the first stage, the crisis occurs through a reduction in the operating cash flows, especially those expected. As a consequence, enterprise value starts to reduce. This is particularly visible for listed firms when the share price starts a negative trend. Debt value is increasing, based on the assumption that, since the operating cash flows decline, the firm is forced to obtain other sources of financing.

During the transition from potential to reversible crisis, the enterprise value of the firm, even if decreasing, is perceived to be higher than the debt value. However, if this situation is not solved promptly, it produces negative effects on the firm's trust and reputation, accelerating value decrease, especially for the reduction of intangible assets value and a more difficult and costly restructuring process. As soon as the crisis starts to be perceived externally, indirect costs of distress arise. These come to light from the reaction of employees, customers, suppliers and financiers. Firms in difficulty often show a progressive increase in the personnel turnover and a reduction of specific competencies, since the most qualified human capital leaves the firm in search of more stable employment. In this way, firm loses bargaining power with suppliers and financiers who impose more strictly conditions. Moreover, sales start to de-

crease as some customers prefer to buy from competitors who are better able to guarantee future assistance on sale and service continuance. The deterioration of financial conditions can lead the management to undertake overinvestment or underinvestment policies, owing to the conflict of interests between the shareholders and creditors.

The critical point of a corporate crisis is reached when the firm's enterprise value is equal to debt value. At that moment, the crisis can no longer be considered potential. Face value of debt increases because of the recourse of new debt instruments and it moves away from its economic value which, on the contrary, becomes even closer to enterprise value. So, firm's capital structure plays a fundamental role both on manifestation and on the crisis management. Given specific operating conditions, the greater is debt amount and closer the critical point of the crisis will be. Buttignon (2008) argued that the presence of debt with pricing or reimbursement conditions independent (at least partially) from operating dynamics, such as long term debt, increases strategic and financial flexibility. The advantage consists in the possibility to recover corporate efficiency conditions without the involvement of creditors. However, since manifestation of the crisis is not perceived externally, this situation can create problems because it encourages intervention delays and opportunistic behaviors by shareholders.

The liquidation value assumes a decreasing trajectory for the effects of external manifestations of the crisis and the less bargaining power of the firm. The more the firm's assets are specific and the lower the liquidation value will be.

The crisis is irreversible when the going concern value of the firm becomes lower than liquidation value. Under this situation, liquidation of the firm becomes the most economically convenient choice even if some hybrid solutions (such as a *total* or *partial spin-off*) can be considered.

### *1.5. Strategies for declining and distressed companies*

When there is a decline or distress situation, firms have to choose the most appropriate strategy to restore the normal going concern condition. This choice depends on the economic situation of the firm, i.e. if the firm is expected to be economically viable in the future. Anyway, the choice of possible strategies can give rise to conflicts between the equity holders and the debt holders due to the fundamental misalignment of interest (Koller et al., 2010). Indeed, when debt exceeds equity, the equity holders normally do not receive any payoff in the event of liquidation. In that case they will try to engage in risky investments in order to return to profitability. Increased risk, however, is not in the interest of the debt holders who may insist

in various types of restrictive *covenants* and monitor management actions in order to protect their interests.

In any case, declining and distressed companies draft a restructuring plan in order to analyze whether they can return to financial health. The restructuring plan normally includes a full valuation of the firm. Based on the outcome of this analysis, the firm has, among others, the following possibilities: liquidation, divestment or restructuring.

If the company is expected to be no longer viable, the conventional strategy recommended is to either *liquidate* all the firm's assets (divest) or to generate the maximum cash flow from existing investments without reinvesting (harvest) (Afflerbach, 2014). Again, the choice between these two options is dependent on several factors. If the firm is able to extract any value from the existing assets, then it will normally harvest. On the other hand, if the industry is inherently unprofitable then the better choice will be to liquidate.

However, the choice is not always in the hands of the firm. If the distress is severe, then there is the risk that the liquidation will be forced through litigation. In general, this strategy assumes that the firm is unprofitable. If potential profits exist, then other strategies may be attractive (Grant, 2010). If the firm is to be liquidated, the value will normally be estimated using the liquidation approach.

The *divestment* of some, or even all, assets of the company can be a viable strategy in a distress and decline situation. Partial divestments form a fundamental part of a company's restructuring efforts, aimed at repositioning the firm in the market. In addition, divestment is a common measure to alleviate the financial condition of the firm and/or to finance restructuring costs. Another option is the sale or a merger with a strategic investor. The goal in this situation, apart from the usual motivations for mergers and acquisitions, is to regain competitiveness through the exploitation of synergies.

If the company, or at least parts of the company, are still economically viable, then restructuring the company is a good strategy in order to return to financial health. In many cases the shareholders prefer this option over liquidation. However, depending on the risk involved, this option is not in the interest of the debt holders. In general, if the restructuring efforts are successful in the first five years then the firm is highly likely to continue to exist in the future. Hence, the risk of bankruptcy vanishes with the increasing success of turnaround.

The choice among these alternatives is dependent on the financial situation of the firm. In the worst case scenario, when the firm is almost in bankruptcy, liquidation is forced by debt holders through litigation. With an improving financial situation the firm can opt for other alternatives.

This thesis will focus primarily on valuation surrounding restructuring efforts. The main idea is to value accurately decline and distressed firms so that the decision-making between divestment, liquidation and restructuring can be improved.

#### *1.6. Critical valuation aspects for firms in trouble*

The main problems that analysts face in the valuation of firms in difficulty derive from the characteristics that these firms present as consequence of distress. In fact, traditional valuation models are build up for the value calculation of firms in normal going concern conditions with positive growth rates and prospects for business continuity. When these methodologies are applied to firms characterized by decreasing revenues, declining operating margins and high levels of debt, the estimates of value determined using these methods can significantly differ from the real intrinsic value of the firm. The reason is that the assumptions underlying traditional valuation models are compromised when a firm faces a decline or distress condition. This restricts the application of such models if they are not adequately adjusted or modified to take into account the effects and the consequences of distress. In fact, Gilson (2000) showed that estimates of value determined using traditional methods are particularly volatile, such that the ratio between the market value and the value of equity estimated using these techniques can varies from 20% to 300%. In the same way, Damodaran (2009) showed that the application of *Discounted Cash Flow model* (DCF) as well as *multiple valuation* to firms in decline or distress can encounter several difficulties and conduct to results that might be far from reality.

When analysts apply DCF, they assume implicitly that the intrinsic value of the firm is equal to the present value of free cash flows that the firm is able to generate during its entire life cycle. However, the application of this method to distressed firms can face the following significant issues (Damodaran, 2009).

1. *Existing assets*. In many declining firms, existing assets, even if profitable, earn less than the cost of capital. This yields a value that is less than the capital invested in the firm. If existing assets earn less than the cost of capital, the logical response is to sell or divest these assets and hope that the best buyer will pay a high price for them. From a valuation perspective, divestitures of assets create discontinuities in past data making forecasts more difficult. Moreover, estimating future proceeds from asset divestitures can be very difficult because the cash obtainable from a divestiture depends on many factors, such as how much an asset is specific, the bargaining power of the firm or the need of a timely divestiture.

2. *Growth assets.* Declining firms derive little value from growth assets and the valuation of these assets should therefore not have a significant impact on value. While this is generally true, there is the possibility that some declining firms are in denial about their status and continue to invest in new assets, as they had growth potential. If these assets earn less than the cost of capital, the value obtained by adding new assets will be negative and reinvestment will lower the value of the firm.
3. *Discount rates.* Corporate crisis affects in different ways the cost of capital at which we discount future cash flows to determine the enterprise value of the firm. First, large dividends and buybacks that characterize declining firms can have an effect on the overall value of equity and on the debt ratios we use in the computation of discount rates. In particular, returning large amounts of cash to stockholders will reduce the market value of equity. If debt is not repaid proportionately, debt ratio will increase, affecting costs of debt, equity and capital.

Second, the presence of distress can have significant effects on both the cost of equity and debt. In particular, the *cost of debt* will increase as default risk increases. So, some rated firms will see their *ratings* drop to junk status (BB, B or lower). Moreover, if operating earnings drop below interest expenses, the tax benefits of debt will also dissipate. In addition, as debt to equity ratio climb, the *cost of equity* should also increase, as equity investors will see much more volatility in earnings. From a measurement point of view, analysts who use *regression betas*, which reflect changes in equity risk on a lagged basis, may face the unusual scenario of a cost of equity that is lower than the pre-tax cost of debt.

4. *Terminal value.* To estimate terminal value, we first estimate a growth rate that a firm can sustain forever, with the caveat that the growth cannot exceed the growth rate of the economy. At this stage of the valuation process, declining and distressed firms pose special challenges.

First, we have to consider the possibility, which will be significant, that the firm being valued will not achieve a stable growth. Many distressed firms, in fact, will default and go out of business or be liquidated. Moreover, even if a firm is expected to survive and reach a steady state, the expected growth rate in perpetuity may not only be below the growth rate of the economy and inflation, but in some cases, it can even be even negative. Essentially, the firm will continue to exist but get progressively smaller over time, as its market shrinks.

Second, the biggest estimation issues come from declining firms that are earning below their cost of capital, with no reason for optimism about the future. In effect, the



most reasonable assumption to make about this firm may be that it will continue to earn a return on its capital that is below the cost of capital in perpetuity. This will have consequences for both reinvestment and the terminal value.

Finally, the problems that we mentioned in the previous section relating to discount rates can represent into the terminal value computation. In other words, a distressed firm can have very high costs of equity which can cause terminal values to implode.

Analysts who use a relative valuation do not solve the problems of valuing declining or distressed firms they face using intrinsic valuation. The main problem of using comparables and multiples are (Damodaran, 2009):

1. *Scaling variable.* All multiples have to be scaled to common variables, which can be broadly categorized into revenues, earnings, book value or sector specific measures. With distressed companies, earnings and book values can become inoperative very quickly. The former because many firms in decline have negative earnings and the latter because repeated losses can drive the book value of equity down and into negative territory. We can scale value to revenues, but we are then implicitly assuming that the firm will be able to restore its operations and deliver positive earnings.
2. *Comparable firms.* There are two possible scenarios that we can face when valuing declining firms. One is when we are valuing a declining firm in a business where all the remaining firms are healthy and growing. Since markets value declining firms very differently from healthy firms, the challenge in this case is determining how much of a discount the declining firm should trade at, relative to the values being of healthy firms. We face the second scenario when we are valuing a declining or distressed firm in a sector where many or even all of the firms share the same characteristic. In this case, not only our choices of what multiple to use become more limited, but we have also to consider how to adjust multiples for the degree of decline of the specific firm.
3. *Incorporating distress.* When firms are not only in decline but are viewed as distressed, we should expect that they have an higher likelihood to trade at lower values (and hence at lower multiples) than firms with lower probability of distress. Unless we explicitly control for distress, we could conclude mistakenly, based on relative valuation, that the first group of firms are undervalued and the second group overvalued.

By now, the message should be clear. Any issues that affect intrinsic valuations also affect relative valuations. The symptoms of decline (negative growth rates, poor or negative margins, flat revenues) and the potential for failure, caused by too much debt and declining earnings, will not disappear as issues just because we base our valuation on a revenue multiple.

In the following paragraphs the thesis will focus on what makes it more complex the valuation of distressed firms. In particular the intention is to illustrate what are the appropriate methods to deal with estimation of the probability of default, direct and indirect distress costs and liquidation value.

#### *1.6.1. Probability of default*

The probability of default risk is a measure of the uncertainty about a company's ability to fulfill its debt and other contractual obligations. In normal economic conditions, company default is a rather rare event.

Before an actual default, it is not possible to unambiguously distinguish between firms that will default and those that will not. However, certain aspects and characteristics have a direct effect on the firm's likelihood of default. These aspects generally include the value and risk of assets as well as leverage.

A firm usually defaults when the market value of its assets is insufficient to repay its liabilities. Campbell, John, Hilscher, Szilagyi (2011) used probability of default as a measure of the financial crisis status while Schmidt (2009) argued that an increase in the default probability gives rise to direct and indirect effects on the firm's equity value.

The insolvency risk, from one side, reduces the expected value of free cash flows, from the other side, it increases significantly the riskiness of debt with effects on the firm's bond rating and higher cost of debt. In such cases, the computation of the probability of default represents a necessary and fundamental element in the valuation process.

In literature there are different methodologies for the calculation of the probability of default which can be classified into three categories.

1. *Accounting-based measures*. These are statistic models which are usually named *credit-scoring models*, based on some financial statements ratios that are considered particularly significant to represent the financial health and risk of the company. The founder of this methodology is Altman, who formulated in 1968 the first *Z-score* model. The formula of Altman is based on five financial statements ratios which consider the dimensions of liquidity, profitability, leverage and solvency. Each index is multiplied by for a specific coefficient, empirically identified by the analyst. The result of this formula represents the *Z-score* and, on the basis of this score, the firm is classified in three zones: *risk-free*, *uncertainty* or *insolvency*. Since this model does not have probabilistic nature, it is very easy to apply and for this reason it is the most widely

used in practice. Given its diffusion, the model has been modified and adjusted many times. The first modification was proposed by Altman in 1993.

Figure 1.2. - The two Z-score models presented by Altman (1968, 1993)

| <i>Z (1968)</i>  | <i>Z' (1993)</i>  |
|--|---|
| $X_1 = \frac{\text{Net Working Capital}}{\text{Total Invested Capital}}$     | $X_1 = \frac{\text{Net Working Capital}}{\text{Total Invested Capital}}$    |
| $X_2 = \frac{\text{Retained earnings}}{\text{Total Invested Capital}}$       | $X_2 = \frac{\text{Net Income}}{\text{Total Invested Capital}}$             |
| $X_3 = \frac{\text{EBIT}}{\text{Total Invested Capital}}$                    | $X_3 = \frac{\text{EBITDA}}{\text{Total Invested Capital}}$                 |
| $X_4 = \frac{\text{Market capitalization}}{\text{Total face value of debt}}$ | $X_4 = \frac{\text{Shareholders' equity}}{\text{Total face value of debt}}$ |
| $X_5 = \frac{\text{Sales}}{\text{Total Invested Capital}}$                   | $X_5 = \frac{\text{Sales}}{\text{Total Invested Capital}}$                  |

*The linear relationship identified by Altman in order to obtain the score is:*

|   |                                      |
|---|--------------------------------------|
| $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 +$ | $Z' = 0.72X_1 + 0.85X_2 + 3.11X_3 +$ |
| $0.99X_5$                                 | $0.42X_4 + X_5$                      |

Although the accuracy of the model, the absence of an explicit measure of probability of default makes it difficult to use it for the valuation of distressed firms. In order to overcome this limit Ohlson (1980) presented a development of the Altman's model which is called *O-score* model. This model determines an O-score on the basis of nine financial statements indicators. The obtained score is then transformed, thanks to a logarithmic transformation, in a value between zero and one which represent the probability of default for the firm under analysis.

Figure 1.3. - The indicators included in the Ohlson's model (Ohlson,1980)

$$O_1 = \text{size factor}$$

$$O_6 = \frac{EBITDA}{\text{Total liabilities}}$$

$$O_2 = \frac{\text{Total liabilities}}{\text{Total assets}}$$

$$O_7 = \text{Sign indicator of net income in the last year}$$

$$O_3 = \frac{\text{Working Capital}}{\text{Total assets}}$$

$$O_8 = \text{Sign indicator of } \frac{B}{V} \text{ of equity in the last year}$$

$$O_4 = \frac{\text{Current liabilities}}{\text{Current assets}}$$

$$O_9 = \frac{\text{Net Income}_t - \text{Net Income}_{t-1}}{|\text{Net Income}_t| - |\text{Net Income}_{t-1}|}$$

$$O_5 = \frac{\text{Net Income}}{\text{Total assets}}$$

2. *Market-based measures.* In this case, the probability of default is determined by using the available information in the market about the firm's stocks and bonds prices.

A first application of this method assigns to each *rating class* a specific probability of default for a specific time horizon. The rating class is assigned by specialized agencies to bond issued by firms and the corresponding probability of default is calculated on the basis of historical insolvency rate recorded by bonds belonging to the same rating class. For instance, the following table by Altman (2007) shows the cumulative probabilities of default for bonds belonging to different ratings classes, five and ten years after issuance.

Table 1.1. - Bond Rating and Probability of Default (Altman, 2007)

| Rating class | Cumulative probability of default |          |
|--------------|-----------------------------------|----------|
|              | 5 years                           | 10 years |
| AAA          | 0,04%                             | 0,07%    |
| AA           | 0,44%                             | 0,51%    |
| A+           | 0,47%                             | 0,57%    |
| A            | 0,20%                             | 0,66%    |
| A-           | 3,00%                             | 5,00%    |
| BBB          | 6,44%                             | 7,54%    |
| BB           | 11,90%                            | 19,63%   |
| B+           | 19,25%                            | 28,25%   |
| B            | 27,50%                            | 36,80%   |
| B-           | 31,10%                            | 42,12%   |
| CCC          | 46,26%                            | 59,02%   |
| CC           | 54,15%                            | 66,60%   |
| C+           | 65,15%                            | 75,16%   |
| C            | 72,15%                            | 81,03%   |
| C-           | 80,00%                            | 87,16%   |

The main limit of this model, as reported by Damodaran (2006), is that the responsibility about the calculation of default probability is delegated to credit rating agencies. Furthermore, the rating is considered constant overtime and relates to a specific bond issue and not to the firm as a whole.

The approach illustrated by Damodaran (2006), consists to calculate the probability of default starting from the market price of the bond issued by the firm, which is put equal to the present value of expected cash flow of the same bond, corrected by the probability of their occurrence and discounted by the risk-free interest rate. Analytically:

$$Bond\ Price = \sum_{t=1}^N \frac{Coupon(1 - \pi_{distress})^t}{(1 + r_f)^t} + \frac{Face\ value\ bond(1 - \pi_{distress})^N}{(1 + r_f)^N}$$

So, by knowing the market value of the firm's bond, the coupon rate and residual time at maturity it is possible to determine the probability of default. Obviously, this method assumes that bond markets are efficient and firms cannot provide an early repayment.

In this way we can obtain an annual probability, ignoring the fact that the probability of default is greater for the first years and then it reduces progressively as the firm restore the normal going concern conditions. Moreover, in presence of convertible bonds or non-listed bonds, this method cannot be used. Another weaknesses of the model is that we obtain different estimates of probability of default depending on the different types of bonds issued by the same firm.

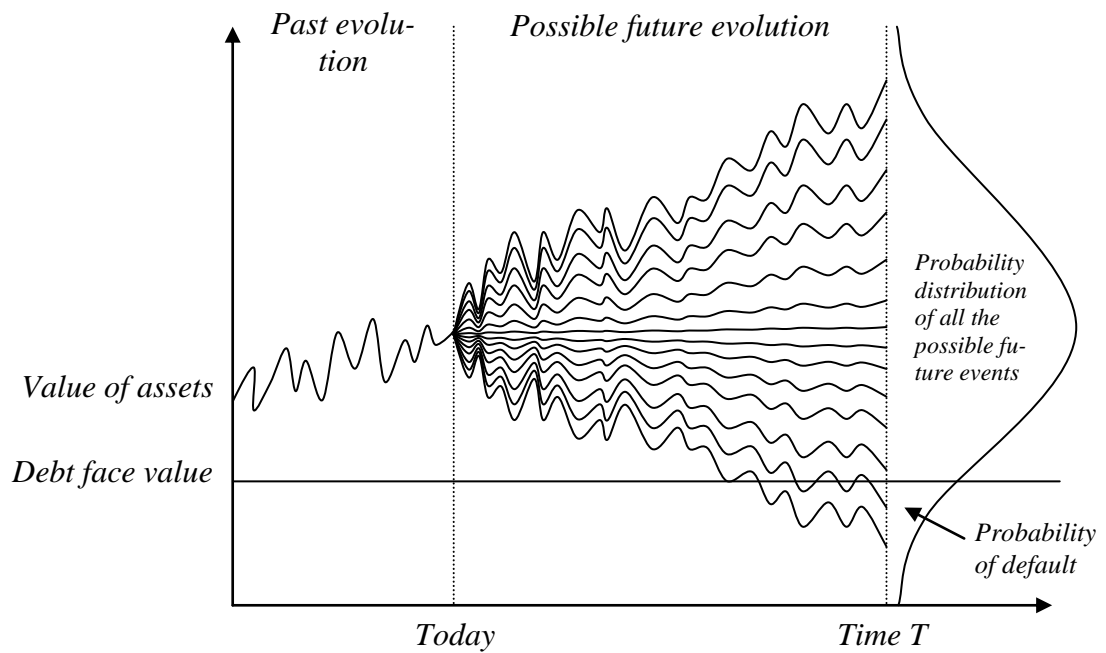
Another method based on market data is the *Option Pricing Theory* developed by Black, Scholes and Merton (Black and Scholes, 1973) which likens equity to a call on assets with a strike price equal to the debt's face value at maturity. From a different perspective, but with equal estimate results, risky debt looks like a composition of risk-free debt and a put option granted to shareholders by creditors to yield assets upon maturity to the debt's nominal value. Under this idea, the market value of the company's assets fluctuates from moment to moment in a partially unpredictable manner. The company's probability of default can be expressed as the probability that the value of assets will be lower than the face value of debt by assuming that the firm's enterprise value in each period follow a stationary process described by the following formula (Merton, 1974):

$$dV_A = r_A * V_A * dt + \sigma_A * V_A * dz$$

where  $r_A$  is the expected return on assets,  $D$  is the face value of debt,  $\sigma_A$  is the standard deviation for the value of assets and  $dz$  is the output of a standard Gaussian distribution.

Visually, probability of default is equal to an area under the normal distribution which represents all negative asset yields that are large enough to lead value of assets at time  $T$  ( $V_T$ ) below the repayment value of the debt ( $D$ ).

Figure 1.4. - Visual representation of the probability of default (Resti et al., 2007)



Shareholders have the option of handing over their company to creditors rather than repaying the company's debt. They can trade  $V_T$  for  $D$  when the former is lower than the latter. This is a put option that the company's lenders have granted the shareholders. In particular, this is a put option on the value of the company's assets, where the strike price is equal to the face value of debt ( $D$ ) at maturity  $T$ .

The value of the option ( $P_0$ ) can be calculated using option pricing model developed by Merton (1974) as follow:

$$P_0 = V_A * N(d1) - e^{-r_f T} * D * N(d2)$$

where:

- $d1 = \frac{\ln\left(\frac{V_A}{D}\right) + (r_f + 0.5\sigma_A^2) * T}{\sqrt{T * \sigma_A}} = \frac{\ln\left(\frac{V_A}{D * e^{-r_f T}}\right) + (0.5\sigma_A^2) * T}{\sqrt{T * \sigma_A}}$
- $d2 = d1 - \sigma_A \sqrt{T}$

- $P_0$  is the price of the option
- $V_A$  is the value of assets
- $D$  is the face value of debt
- $r_f$  is the risk-free rate
- $T$  is the residual time to the maturity of debt
- $\sigma$  is the standard deviation of the return on assets
- $N(.)$  is the standard normal cumulative density function and  $N(d)$  indicates the probability associated with a value less than or equal to  $d$ .

The last part of the formula is the present value of the firm in case it becomes insolvent. The company's probability of default can be expressed as the probability that the market value of the company's assets will be less than the repayment value of debt at maturity. Specifically,  $N(d_2)$  is the risk neutral probability that the firm will be able to fulfill its debt obligations because  $V_A > D$ . In this case the firm will fulfill debt payments with the current value of the firm's assets that is  $V_A = e^{-rT} * D$ .

So, the probability of default for the firm can be computed as follow:

$$\text{Probability of default} = P(V_A^T < D) = 1 - N(d_2) = N(-d_2)$$

As we can see, all other things being equal, probability of default increases as:

- The beginning market value of assets ( $V_0$ ) decreases
- The nominal value of debt ( $D$ ) increases
- The volatility of the market value of assets increases (with a higher  $\sigma_A$  the distribution becomes more "squashed" and the tails thicken);
- The debt's maturity increases.

Limitations of Black, Scholes and Merton model (BSM model) are particularly significant when shifting from pure theory to the actual use of the model for empirical estimates of probabilities of default or spreads. These problems fall into several categories.

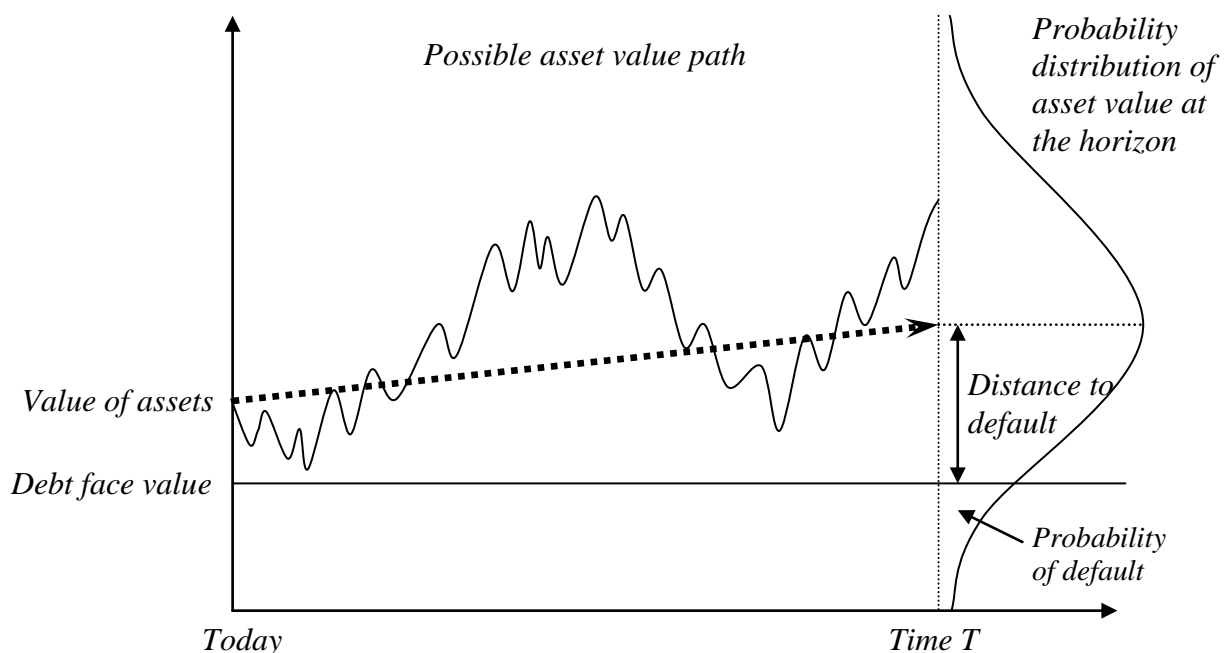
- The simplistic assumption of a single zero-coupon liability where principal and interest are repaid in a lump sum upon maturity. In real life companies have complex financial structures with liabilities that have a variety of maturities and periodic interest payments, as well as a number of different levels of seniority and security. Furthermore, companies can default at any time when they miss the payment of a bond coupon or do not pay interest on bank loans, regardless of the maturity of their liabilities.

- BSM model assumes that the distribution of asset returns is a standard normal: such an assumption may not be realistic.
- Some model's inputs are not observable directly on the market, such as the market value of assets ( $V_0$ ) and the volatility of asset returns ( $\sigma_A$ ).
- The assumption of constant risk-free interest rates. This assumption has been removed by various authors, such as IGM, Ramaswamy and Sundaresan (1993), who have proposed a model with stochastic interest rates and bankruptcy costs.
- BSM model focuses solely on default risk, without considering migration risk, i.e. the risk of a deterioration in the issuer's credit rating. BSM model provides no indication on to the likelihood that the company's credit rating should decline, despite remaining solvent.

An extension of the BSM model had been presented by Kealhofer, McQuown e Vasicek and is known as *KMV model*. The distinctive characteristic of this model is the definition of default: a firm defaults as soon as the market value of assets becomes lower than a *default point*. The default point change from company to company and can be identified between the value of total liabilities and that of the current liabilities. The probability of default for each firm can be calculated on the basis of its *distance to default* which represents the distance between the expected value of assets and the default point.

$$\text{Distance to default} = \frac{\text{Market value of Assets} - \text{Default Point}}{\text{Market value of assets} * \text{Asset volatility}}$$

Figure 1.5. - Distance to default (Sundaram R.K., 2001)





Then, through a database of historical data, the distance to default is converted to a probability of default. The *distance to default* is a widely-used and popular method which has found successful commercial application by institutions such as Moody's credit rating agency.

3. *Hybrid measures*. Hybrid measures for the probability of default combine in the same model both market information and financial statements ratios in order to improve the robustness and accuracy of estimates. Main credit agencies often use hybrid measures to determine rating class for companies under investigation. The inputs of such a model include financial and economic indicators, credit rating and stock market information. Then, these data are processed through a regression analysis which produce some intermediate results that are first transformed in a credit score and then to rating classes on the basis of some specific tables.

#### *1.6.2. Direct and indirect distress costs*

Direct and indirect distress costs are strictly linked with the default probability and the firm's amount of debt. The higher is the leverage ratio for the firm, the higher is the likelihood that the firm faces a distress situation and incur such costs. For this reason the assessment of these costs is important for the valuation of firm in crisis and they represent a central element in the determination of an optimal capital structure.

*Direct costs of distress* include legal costs, costs of appraisals, accounting and administrative costs. The determination of the impact of these costs on the value is relatively low and not so much problematic since they are measurable.

*Indirect costs of distress*, instead, are due to the negative impact of distress on the relationships with creditors, suppliers, customers and employees. These affect the firm's capacity to continue the business activity because of more expensive financing conditions, loss of credibility or the necessity to liquidate assets in short term. Other indirect costs come from the difficulty situation which make it easier for management to undertake activities and investments that do not create value for the firm.

The valuation process for firms in trouble should take into account direct and indirect distress costs by considering the degree of decline irreversibility and the level of severity of financial crisis. From an operative point of view, the degree of reversibility of a corporate crisis can be identified on the basis of the firm's history and the healthy status of other firms in the indus-

try. A firm that in the past had been characterized by an alternation of positive and negative phases, which operate in a sector where most of the firms are in good status or which can benefit from positive macroeconomic trends, has good possibilities to overcome the operating difficulties through a management change or other strategic measures. The financial distress can be assessed on the basis of the debt amount accumulated by the firm and the rating associated with it.

Table 1.2. - A framework for dealing with decline and distress (Damodaran, 2009)

|  | <i>No or low Distress</i><br><i>(low debt, investment grade rating)</i>   | <i>High Distress</i><br><i>(High debt commitments, low rating)</i>   |
|--|---|--|
| <i>Irreversible</i><br><i>(Sector in trouble)</i>            | <ol style="list-style-type: none"> <li>1. Value the firm with existing management and expected decline (Going concern value)</li> <li>2. Value the firm, assuming orderly liquidation of all of its assets.</li> <li>3. Expected Value = Maximum (Going concern value, Orderly liquidation value)</li> </ol>              | <ol style="list-style-type: none"> <li>1. Start with the expected value (irreversible, no distress)</li> <li>2. Estimate the probability of distress and proceeds from forced liquidation of firm.</li> <li>3. Re-compute the expected value, adjusting for distress.</li> </ol>   |
| <i>Reversible</i><br><i>(Firm outlier in healthy sector)</i> | <ol style="list-style-type: none"> <li>1. Value the firm with existing management and expected decline.</li> <li>2. Value the firm with better management and recovery.</li> <li>3. Expected Value = Status Quo Value (Probability of no management change) + Optimum Value (Probability of management change)</li> </ol> | <ol style="list-style-type: none"> <li>1. Start with the expected value (reversible, no distress)</li> <li>2. Estimate the probability of distress and proceeds from distress sale of firm.</li> <li>3. Re-compute the expected value, adjusting for distress.</li> <li>4. If equity investors run the firm, value the option to liquidate.</li> </ol> |

Firms with high leverage and rating below the *investment grade* are more exposed to the risk of default. Depending on these factors, Damodaran (2009) proposes a different valuation approach, which aims to understand the peculiarities produced by each type of crisis. The possible alternatives and the valuation actions proposed for each situation are shown in the table 1.2.

Situations of *reversible decline/low distress* are characterized by the stagnation of revenues, fall of operating margins and signs of financial difficulties shown by covenant breach without explicit signals of short-term difficulties to fulfill debt payments. In this case the intervention to recover the previous productivity levels involve the internal reorganization and, in many cases, this can be carried out through a management change. To calculate the firm's value, the analyst should estimate the status quo value, which is the value of the firm under the actual conditions of productivity and control, and the optimal value, measured assuming the presence of new management with the capabilities to recover the initial phase of decline. The ex-

pected value of the firm is equal to the average of these values, weighted by their probability of occurrence:

$$\text{Expected value} = \text{Status Quo value} (1 - \text{probability of management change}) + \text{Optimal value} (\text{Probability of management change})$$

In situations of *reversible decline/high distress* the crisis derives mainly by capital structure issues due to wrong investment choices or sales growth lower than projected. Moreover, the decline in operating conditions creates liquidity and financing problems which may result in an imminent impossibility to fulfill debt obligations. The restructuring should consider operating interventions and especially the improvement of financial structure, through rescheduling plans and debt reduction strategies. From a valuation point of view, the estimation of enterprise value cannot ignore an estimate of the probability of default and the proceeds obtainable from a possible assets liquidation.

When the operating performance is compromised and the firm faces a situation of *irreversible decline/low distress*, it could be more convenient to proceed with divestment of the firm's assets. This generally occurs when the entire market in which the firm operates contracts and there are poor future perspectives to create value. Despite the actual disruption of value, the first step in the valuation process is to estimate the going concern value, i.e. the value of the firm in the actual operating conditions. Subsequently, we can focus on more profitable alternatives for the use of assets. The absence of external financial pressures makes more effective the liquidation process as the firm can wait the right moment and the best buyer. In case the proceeds obtainable from the liquidation is greater than the value obtainable from the use of assets, the management should divest the firm's assets, with the only exception for those businesses that are able to generate value independently.

In the worst case, the crisis can be defined as *irreversible decline/high distress*. In this case economic and financial conditions are so deteriorated that the unique alternative is to proceed with a timely disintegration of the corporate system, usually through a court litigation. The determination of the firm's liquidation value should be made considering the weak bargaining power of the firm due to the insolvency situation, the number of possible buyers depending on the industry conditions and the poor value expected by potential buyers from the assets being liquidated.

### 1.6.3. Liquidation value

There are different arguments to consider when liquidation approach is used in valuation process.

In theory, the liquidation value is determined by the difference between the book value of assets owned by a company (such as the real estate, fixtures, equipment and inventory) and the market value obtainable upon sale.

It must be noted that, contrary to the normal sale of the company, intangible assets are not included in a company's liquidation value. In general, there are two possible liquidation scenarios. In the case of severe financial distress, debt holders can call for forced liquidation through litigation. In this case, operations are immediately shut down and the company's assets are liquidated in a "fire sale". In this scenario the company is only able to obtain a distressed price due to the lack of bidders in the auction process. In the other situation the company is not in immediate distress but the liquidation value is just higher than the aggregate future income or free cash flows to the firm. In this case the company has enough time to maximize the proceeds of its assets via an orderly liquidation. Additionally, the business can still generate income while the liquidation is underway, and this income also needs to be taken into consideration when estimating value. Therefore, the orderly liquidation value is generally much higher than the distressed liquidation value (Kahl, 2002) (Petersen and Plenborg, 2012).

Liquidation plays an important part in distressed companies. A company is normally liquidated when its assets would yield a higher value in a sale than the present value of its potential future earnings and cash flows. It is therefore a logical and common choice when the company is in economic distress, i.e. the company's assets are not in the highest value in use. Nevertheless, as previously mentioned, a liquidation can also be forced through litigation by the debt holders. In general, the value obtained through a liquidation represents the lowest end of a company's value range and normally represents the most unfavorable scenario for the equity holders (Brown et al., 1994).

Estimating the proceeds from a liquidation is very difficult because it ultimately depends on how the market values the assets. This in turn is dependent on the state of the economy and the asset specificity but also on the company's situation and the way in which the assets are liquidated. In any case, the loss suffered by investors in the event of default is considerable. Again, both the amount at risk and loss given default, is dependent on the type of investment and is ultimately determined by the particular contract or obligation. In particular, while debt investments, such as loans, have a recovery rate between 50 to 89 per cent, equity investments have a much lower or, in many cases, a 0 per cent recovery rate (Afflerbach, 2014). However, assessing the different factors affecting the liquidation value is a research out of the scope of this study.

There are several ways to derive a possible liquidation value. One of the most common ways to estimate the liquidation value is to use the book value of assets and to assume a discount depending on the previously mentioned factors. However, using the book value, which represents the amount the company invested when it was in a better situation, tends to be over-optimistic. To correct for this, the discount factors have to be chosen carefully. Another option is to derive the

liquidation value by discounting the cash flow generated by assets, but with no growth prospects. Although a reasonable option, this method should not be used in the scenario of a company in decline since these firms tend to have negative growth rates and therefore the method would overvalue the assets.

The choice between the two mentioned methods depends on the availability of information. The most practical way to estimate the distress sale proceeds is to consider them as a percentage of book value of assets. However, it is somewhat difficult to make a good assumption of the discount on book value applied. Normally, the value is derived from the experience of other distressed liquidation within the industry. There is a significant amount of information available regarding distressed firms, but since every industry is different and every asset has its own characteristics, such information might not be applicable (Brown et al., 1994). Besides, in many cases the assets of the company are very industry specific and cannot be used for other business areas. Therefore, another method based on the concept of the DCF approach can be used to value the company's assets. The main idea is that the asset's value is determined by the future cash flows they can generate. Therefore, the average EBIT in the past years should be calculated in order to reflect the earning power of assets and it is then discounted by the cost of capital.

The following formula can be used to calculate the value of the firm's assets:

$$\text{Value of assets} = \frac{EBIT \times (1 - \text{tax rate})}{WACC}$$

It has to be noted that no growth is assumed. This formula derives the value that a healthy firm would be willing to pay for the company's assets. While this approach is more accurate than just using the book value of assets, it does not reflect the loss in value the company might suffer because of the bad bargaining position in distress and other external factors. Depending on the firm's situation of the firm and the economy certain discounts should be applied. Since the amount of discount is dependent on the characteristics of the firm, it has to be estimated on a case by case basis.



## **CHAPTER 2 - Valuation models for declining and distressed firms**

### *2.1. Introduction*

Academic literature offers a wide range of studies about different valuation techniques and a considerable amount of articles dealing with declining, financial distress and risk of bankruptcy. However, there are very few research studies that combine the two topics and explicitly deal with the valuation of declining and distressed companies. Some of the most notable works on this topic are single chapters of books on valuation or bankruptcy, by authors such as Damodaran (2009), Arzac (2008) and Scarberry (1996).

While there are hundreds of approaches to valuing distressed firms, the most used by practitioners are:

1. Discounted Cash Flow model (DCF)
2. Adjusted Present Value model (APV)
3. Multiple or relative valuation (MV)
4. Option Pricing Valuation (OPV)

These approaches can yield very different estimates of value for the same asset and at the same point in time. Depending on the circumstances and the characteristics of assets, one method might be more applicable than others but they are often used to complement each other. All traditional valuation techniques can be used in a distressed company setting, but all have significant drawbacks. In general, all the traditional approaches face the same problem in a distressed scenario since they all assume that the firm will continue to exist into perpetuity. For example, in both DCF and MV, the mere assumption of the terminal value assumes that any financial distress is temporary and that the firm will not cease operations in the future. Nonetheless, this assumption completely neglects the risk of bankruptcy and the possibility that the firm might liquidate and cease to exist. While there is a chance that the firm will return to financial health, in a distressed scenario there is a significant risk that the expected future cash flows truncate because of bankruptcy or liquidation. Ignoring this risk can severely overestimate the firm's value. However, including this risk in traditional valuation approaches can be very challenging. While a full analysis of the traditional valuation methods is beyond the scope of this study, the following paragraphs will briefly analyze the problems of traditional valuation techniques in a distressed company scenario and highlight possible adaptations to account for the risk resulting from distress.

In the first paragraph we will discuss the application of the DCF model and how it can be adjusted to take into account the effects of distress. In particular, the focus will be on scenarios analysis and going concern DCF adjusted for probability of default.

Then, the analysis will consider the APV technique. Even this method is based on discounting future cash flows but it differs from DCF approach because it treats separately the capital structure effects on value.

Paragraph 2.4 focuses on the valuation based on the market multiples. The simplicity of this method has considerably increased its use, especially to support and control the results delivered by the other valuation techniques.

Paragraph 2.5 deals with the discussion of OPV method which can be useful to justify positive stock value, even if the value of assets is lower than the nominal value of debt. An important advantage of this method is that, if it is applied to firms in crisis, it can indirectly estimate the probability of default and assigning a value to uncertainty and future opportunities. To conclude our analysis we will focus on Capital Cash Flow model and DCF method with Monte Carlo simulations.

## 2.2. *Discounted Cash Flow Model*

The intrinsic value of an asset is the fundamental, theoretically true, value of the asset. It is normally estimated on the basis of its cash flows, growth potential and risk. In general, *Discounted Cash Flow (DCF)* approach aims to estimate company's value as the present value of estimated future cash flows discounted with an appropriate rate, called *weighted average cost of capital (WACC)*.

Valuing firm's equity by using the DCF is a process that requires four steps (Koller et al., 2010):

1. The valuation of the core business of the firm, which is equal to the present value of operating free cash flows that the firm will be able to generate in the future, discounted by WACC. This value is also called the *business enterprise value*.
2. The identification and valuation of non-operating assets, such as marketable securities, non-consolidated subsidiaries and other non-operating investments. The sum between the core business value and the value of non-operating assets is the *enterprise value of the firm*, which is the economic value of corporate activity.
3. Third step involves the determination of market value of the firm's consolidated *net financial position (NFP)*, minority interests and other non-equity claims, such as *unfunded pension liabilities* and *employee stock options*.



Practitioners often use net financial position resulting from the last financial statements as an approximation of the NFP market value. However, when considering firms in trouble, this approximation cannot be used because the market value of debt can change dramatically day by day. In fact, this kind of firms are engaged in debt negotiation processes with the aim to modify contractual terms or to convert debt into equity. In order to value the firm's net financial position accurately, Damodaran (2009) suggests:

- Update frequently the debt amount, even if this could be difficult for an external analyst especially when the firm conducts private negotiations with the creditors.
  - Estimate frequently the market value of debt as the probability of default can varies significantly from period to period. Even if no debt instruments are traded in the financial market, the nominal value of debt cannot be used as a proxy of the market value of debt in distressed firms.
  - In the presence of convertible bonds, the option value should be excluded from the debt value and considered as part of equity.
4. By subtracting the market value of debt from the business enterprise value we can obtain the *equity value*. Analytically, equity value can be computed as follow:

$$\text{Equity} = \text{Enterprise Value} - \text{Net financial position} - \text{Minorities}$$

More precisely, business enterprise value included in the preceding formula and computed using the DCF method, can be illustrated as follow:

$$\text{Business Enterprise Value} = \sum_{t=1}^n \frac{OFCF_t}{(1 + WACC)^t} + V_T$$

where:

- $OFCF_t$  is the operating free cash flow at time  $t$  in the explicit forecasting period
- $WACC$  is the discount rate expressed as the weighted average cost of capital
- $n$  is the number of years for the explicit forecast period
- $V_T$  is the present value of terminal value, i.e. the present value of operating free cash flows from the period  $n + 1$  ahead.

So, the firm's value is equal to the present value of future operating free cash flows in the explicit forecasting period and the terminal value which include the cash flows subsequent to that period. Cash flows included in DCF model are available to both shareholders and debt holders.

Although DCF is a popular and widely-used method, the problem with its application lies in the complexity of estimating the different inputs. In fact, a firm in financial distress has some

or all of the following problems: negative earnings and cash flows, difficulty to meet debt payments and high leverage ratio. The solution to the problem depends, to a large extent, on how distressed the firm really is. If distress is expected to be not fatal, in the sense of pushing the firm into liquidation, there are various potential solutions. If, on the contrary, distress is likely to be terminal, finding a solution is much more difficult.

An investor or analyst has to reliably estimate the following three aspects which are essential for any DCF analysis:

1. Cash Flow Projections
2. Discount rate
3. Terminal Value

Choosing appropriate inputs for DCF analysis can be difficult. A minor change in any one of the above variables can significantly affect the estimated value of the company. In case of decline scenario this task can be even more complex. The following section will analyze each part of the DCF method and the complexities when applied to distressed or declining firms.

### *2.2.1. Cash Flow Projections*

The first step required to estimate future cash flows consists to reorganize financial statements with the objective to distinguish operating from non-operating items.

In particular, from the reorganization of *Income Statement* we can determine *NOPLAT (Net Operating Profit Less Adjusted Taxes)* of the firm, i.e. the after-tax operating profit which does not include any gain from non-operating assets and financing expenses, such as interest. Whereas net income is the profit available to equity holders only, NOPLAT is the profit available to all investors, including debt holders.

From the reorganization of *Balance Sheet* we can determine *total invested capital* which include net working capital, operating fixed assets and all the other operating assets and liabilities.

Once reorganizing the entire financial statements, we should proceed with an historical analysis of the firm's performance: this is a fundamental step to forecast correctly future cash flows. Such an historical analysis enables to understand whether the firm has created value, how much it has grown and to compare this trend with that of competitors. More precisely, this analysis should focus on *key value drivers*, such as *ROIC (Return On Invested Capital)*, sales growth rate and composition of free cash flows.

ROIC measures operating performance of the firm and enables to stress the contribution of each part of the business to the entire value creation process. In any case, if ROIC is lower

than WACC there is no value creation. The firm creates value only if return on invested capital is higher than the cost required by investors to finance the firm.

Given the length of the explicit forecasting period, we can project the evolution of main variables included in the Income Statement and Balance Sheet. These projections should be based on historical data, market analysis, industrial and strategic plans made by the management. Particularly important in this phase is the firm's *business plan*, i.e. the document containing the strategic objectives for the future three to five years and a clear determination of key success factors. Moreover, the business plan should indicate the amount of investments required to support the firm's strategy in order to obtain a positive and continuous cash flow overtime.

In practice, the projection of future data for declining and distressed firms can face several difficulties because it cannot normally rely on the firm's history. However, if the restructuring plan makes detailed assumptions about cash flows during the transition period from distress to financial health, the discounted cash flow valuation may still be feasible. The valuation accuracy is clearly linked to the assumptions about probability to restore financial health, length of transition period and projections made during the transition period. In case of distressed companies it is preferable to prolong the explicit forecasting period, at least to cover the entire restructuring plan, to evaluate the impact on value by the proposed financial and operating interventions. Generally, the explicit forecasting period should be equal to the period necessary for the firm to reach a steady state after the implementation of restructuring plan.

Free cash flows included in the DCF valuation can be determined as follow (Koller et al., 2010):

$$FCF = NOPLAT + Non\ cash\ operating\ expenses - Investments\ in\ invested\ capital$$

So, to determine free cash flows, NOPLAT should be adjusted for the operating items which do not give rise to cash disbursement or cash receipt less the cash used for working capital operations and investments.

However, it is important not to forget that in case of a distressed firm there is the risk that the firm will cease operations and essentially truncate the cash flows before reaching the steady state. Since the DCF method is designed for healthy and growing companies, it does not take into account this risk. Different possibilities have been presented in literature to account for this risk. The most widely used are the scenarios analysis and DCF model adjusted for the probability of default.

### 2.2.2. Cost of capital calculation

Interest rate used to discount the firm's expected free cash flows is called *weighted average cost of capital (WACC)* and it reflects the systematic risk of the firm. WACC represents the opportunity cost for all the investors to invest their money in a specific business instead of another one. A correct and reliable calculation of WACC constitutes one of the most tricky steps in the application of DCF model because of its great impact on firm's enterprise value. WACC is the weighted average between cost of equity and cost of debt as shown in the following formula:

$$WACC = \frac{D}{D + E} (1 - t)K_D + \frac{E}{D + E} K_E$$

where:

- $\frac{D}{D+E}$  is the weight of debt on the enterprise value
- $t$  is the corporate tax rate
- $K_D$  is the cost of debt
- $\frac{E}{D+E}$  is the weight of equity on the enterprise value
- $K_E$  is the cost of equity

Cost of equity estimation is one of the open debates in corporate finance. It is the rate of return that shareholders expect to obtain from the company on the basis of the risk associated with their investment. The most commonly used method to determine cost of equity is the *Capital Asset Pricing Model (CAPM)*. Based on this model, the cost of equity is the sum between the risk-free rate and the risk-market premium multiplied by a beta coefficient which expresses the systematic risk of the investment. Analytically, the cost of equity formula can be written as follow:

$$K_E = r_f + \beta(r_m - r_f)$$

where:

- $r_f$  is the risk-free interest rate which expresses the expected return of risk-free securities. It can be estimated looking at the returns of long term government bonds issued by risk-free countries.
- $\beta$  is the volatility coefficient which expresses the systematic risk of the firm
- $(r_m - r_f)$  is the *market risk premium*, measured as the excess return that the investors require to invest in the stock market instead of risk-free securities.

Cost of debt can be defined as the interest rate that the firm would pay to obtain long term financing under actual market conditions. If the firm has obtained new financing recently, we

can put the cost of debt equal to the financial charges associated with recent debt issue. On the contrary, if the debt was issued in a prior period, when the firm was characterized by better economic and financial conditions and lower probability of default, interest payments associated with existing debt are not an adequate measure to determine the firm's cost of debt. In fact, especially during crisis situations, the cost that the firm sustains to issue new debt is considerably higher than the cost of existing debt.

Koller (2010) suggests to use *yield to maturity (YTM)* associated with long-term bonds as a proxy of the cost of debt. However, as YTM is calculated considering that all the coupon payments are met and the nominal amount of debt totally repaid, this approach cannot be used for declining and distressed companies as the probability that firm will default its debt payments increases the risk faced by the creditors, and thus the cost of financing. Alternatively, we can determine cost of debt according to the *rating class* associated with the firm. This means that we should add to the risk-free rate a *default spread*, determined on the basis of the company's financial health. The higher the rating class of the company, the lower the spread will be.

The cost of debt calculation for distressed firms requires particular precautions to avoid that the traditional methodologies underestimate the true value of  $K_D$ . The capital structure, and thus the ratio between debt and equity, should be evaluated using market values and not nominal ones. Moreover, estimates must reflect a *target capital structure* defined by management according to financing plans. Alternatively, it could be useful to make reference to the average capital structure of comparable firms, assuming that in the long run the firm adopts a capital structure in line with the industry.

Using a target capital structure constant for the entire valuation period represents without doubts a great limitation in the valuation of companies characterized by high leverage and involved in restructuring plans. In fact debt negotiations, debt or interest payments write-offs as well as the issue of new debt have the effect to change market value of debt year by year making misleading the results of traditional valuation models. In such a case, the relationship between debt and equity differs significantly from the actual capital structure and should be defined according to the firm's objectives in terms of debt management, restructuring plan and corporate communications.

Damodaran (2009) argues that the common approach to estimate the cost of equity through CAPM will lead to inconsistent estimates of WACC in presence of high probability of default associated to the firm.

If we estimate beta as a regression analysis, during a specific time horizon, this beta tends to underestimate the risk associated with the firm because the historical data do not incorporate

the effects of the recent crisis situation. Another reason for which beta computed in this manner could be misleading is that during periods of corporate crisis share prices tend to be highly volatile due to the rumors about possible restructuring plans or default. For these reasons the regression beta can even reduce during crisis periods.

Domadoran (2009) proposes two different approaches to overcome the above mentioned obstacles and to give a more reasonable of cost of equity in a distress scenario:

1. *CAPM betas adjusted for distress.* In this case beta is computed through the bottom-up *unlevered beta*, determined as the weighted average of unlevered betas for comparable firms in the same industry. This unlevered beta is then adjusted for capital structure to obtain the levered beta of the firm being valued.

$$\beta_L = \beta_U + \frac{D}{E}(\beta_U - \beta_D)$$

Considering that firms in trouble have often high leverage ratios and do not realize a sufficient income to exploit fiscal advantages of debt, beta levered can be much higher than the beta obtained by a regression analysis. Leverage ratio and corporate tax rate should be estimated in a way such that levered beta reflects future expectations about possible changes on these variables.

2. *Distress Factor Models.* This methodology calculates cost of equity by using an average beta derived from comparable firms which are not in trouble plus an additional factor, representative of the risk conditions linked to the crisis for the firm being valued.

$$\text{Cost of equity} = rf + \beta_{\text{healthy}} \times \text{Equity risk premium} + \text{Distress premium}$$

Distress premium can be calculated either according to returns realized by stocks of firms in crisis or by comparing the pre-tax cost of debt of the firm with the average cost of debt of comparable firms in the industry.

The conventional practice for estimating cost of debt suggests to adopt interest rates associated with corporate bonds traded on the markets. However this practice can give distorted estimates when applied to declining and distressed firms as yield to maturity of these bonds is computed considering cash flows promised by the security (coupons and face value reimbursement) and not expected cash flows. For firms with high probability of default the assumption that the firm will be able to meet its debt obligations is not satisfied and thus yield to maturity for this kind of bonds is not a correct measure for the calculation of the cost of debt. To solve this problem, the proposal of Damodaran (2009) is to use an interest rate based

on the rating associated with the firm's corporate bonds which reflects the higher probability of default.

$$\text{Pre-tax cost of debt} = \text{risk-free rate} + \text{Default spread}$$

Firms which cannot issue bonds in the market, and thus do not have a rating class, can determine a synthetic estimate of their rating by using an *interest coverage*.

Cost of capital calculation is fundamental to estimate the weight of debt and equity on enterprise value. The conventional practice of using target capital structure can lead to inaccurate estimates of WACC for distressed and declining firms. For this reason, the actual ratio between market values of debt and equity (usually quite high for firms facing a crisis) should be adjusted to more reasonable levels in line with the restructuring plan implemented by the firm.

### 2.2.3. Terminal value calculation

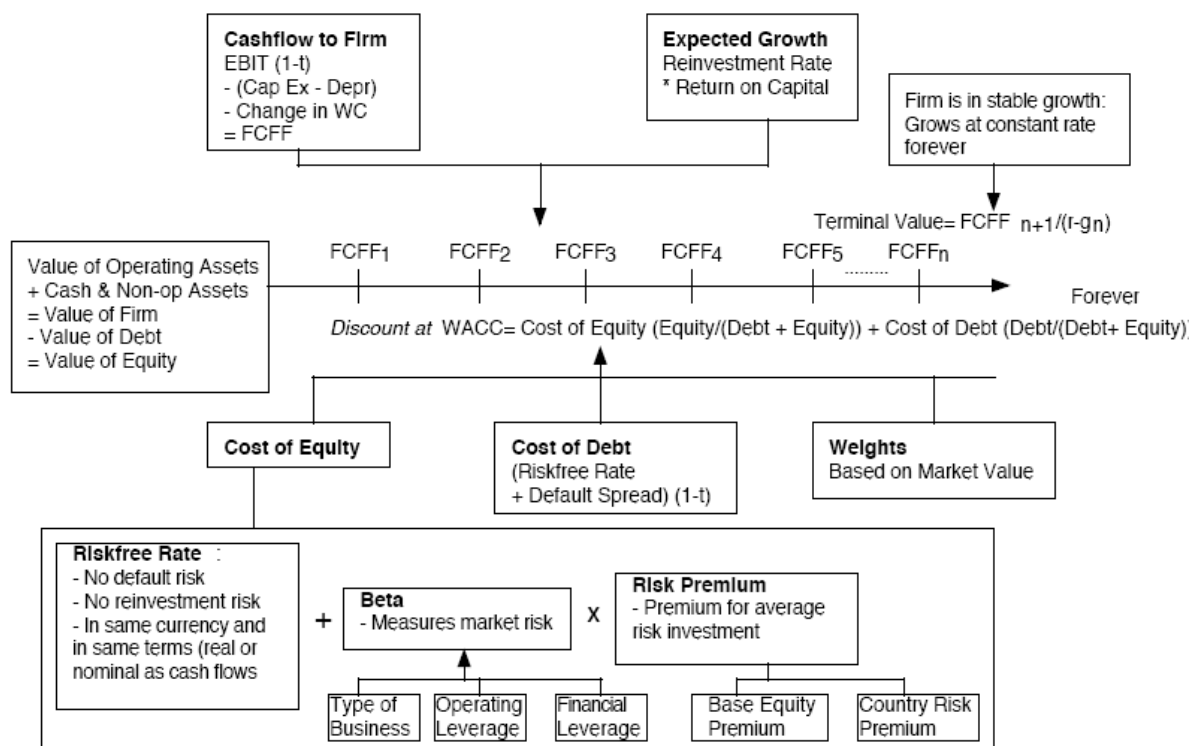
Terminal value represents the value of the operating cash flows after the explicit projection period. The estimate of terminal value is tricky because of the great incidence of the terminal value on the firm's total value and the absence of widely shared methodologies for its determination. Generally, terminal value should coincide with the period in which the firm reaches its steady state, characterized by constant ROIC and growth. Terminal value formula by Koller et al. (2010) is based on the free cash flow projected in the first year after the explicit forecasting period and a perpetuity growth rate.

The *perpetuity growth rate* ( $g$ ) should be equal to the long term growth rate of the firm's sales considering that no firm can grow at a rate that is higher than the growth rate of the economy in the long term (Damodaran, 2011).

Figure 2.1 summarizes the main steps of DCF methodology represented by Damodaran (2011).

This approach assumes that the firm being valued operates as a going concern and its life is potentially infinite. However, in presence of high probability of default this assumption is particularly unrealistic and ignores the possible effects of distress leading to misleading valuation. Nevertheless, some analysts believe that the application of DCF method remains still valid for distressed firms and it is not necessary to explicitly consider the probability of default because the consequences of distress are already incorporated in the model.

Figure 2.1. - A representation of the Discounted Cash Flow model (Damodaran, 2011)



The arguments that support the use of traditional valuation approach in a distress scenario can be listed as follow (Damodaran, 2006):

1. Valuation topic mainly relates large and listed companies with a low probability of default. However, the events occurred in the recent years demonstrate that even large companies considered *too big to fail* can fail. Moreover, the valuation process is necessary and essential also for small companies with relevant growth opportunities, listed or non-listed. In this case the need of a company valuation is even greater given the more uncertainty and, consequently, the higher possibility of mistakes in the pricing.
2. The capital market access is not bonded. In presence of financial markets well developed, it is possible to assume that firms with good investment possibilities can access capital market for obtaining funds necessary to implement their strategies. In reality, this assumption has not revealed so credible, even in the open and accessible markets.
3. Discount rate already incorporates probability of default. This statement is based on the idea that discount rate applied to DCF model adjusts the risk of declining and distressed firms, because risky firms have an higher cost of debt and equity. The result is an higher cost of capital which reduces the present value of expected cash flows. Even if this reasoning is true, the reduction of value resulting from an higher discount factor catches only partly the loss of value derived from the corporate risk. The hypothesis



that the firm will be able to generate perpetual cash flows remains and its contribution to the determination of the total corporate value is relevant. In other words, the most relevant effect of distress, i.e. the loss of future cash flows, is not adequately considered in the valuation.

4. The probability of default is already included in the estimation of future cash flows. The expected cash flows should be computed as the average of cash flows for all the possible scenarios, weighted for the probability associated with each scenario. In practice, cash flows are generally determined on the basis of estimates about sales growth rates and operating margins made by analysts. However, professionals of valuation often tend to trace optimistic growth path and a sudden return to normal operating conditions for firms with economic and financial difficulties. In addition, the approach that allows the determination of future cash flows on the basis of future scenarios, from the best to the worst hypothesis, does not represent a risk adjustment, but only a correct way to determine future cash flows.

Adjusting cash flows projections to take into account the possible default of the company is particularly complex and requires an estimation of the probability of default for every year of projection.

5. In the event of a default, the firm will be able to obtain expected cash flows from the proceeds of a liquidation. This statement supposes that the defaulted firm can be sold to the best acquirer at a price equal to the present value of expected cash flows. In this case, there is no necessity to consider distress explicitly. This assumption, however, is particularly unrealistic because it means that, even though the firm is in trouble, it maintains a bargaining power such that it will be able to ask a sale price equal to the fair market value.

Given the above considerations, consequences of a distress does not affect DCF valuation only if the following conditions are met:

1. There is no possibility of default for the firm, given the size, conditions or government guarantees.
2. The ease capital market access allows the firm with good investment opportunities to obtain new equity or debt, even during crisis or recession periods, preventing the occurrence of a liquidation.
3. It is possible to determine expected cash flows which incorporate probability of default and the discount rate is adjusted by the increased risk of the distressed firm. Moreover, in case of a liquidation, the proceeds of the firm's sale should be equal to the expected free cash flows of the firm as a going concern.

In the event that one or all of these conditions do not present, as in the majority of the corporate crisis situations, the traditional DCF technique will produce an estimate of value that is higher than intrinsic value of the firm. For this reason, we present in the following paragraphs a series of adjustments to the traditional DCF technique which take into consideration the probability of default and the possible consequences of distress in order to obtain more precise and accurate estimates of value for distressed firms.

#### 2.2.4. Scenarios analysis

DCF method can be used for the valuation of distress and declining firms whether it is correctly adjusted to reflect distress effects on value. These adjustments concern the estimation of free cash flows and discount rate calculation.

Damodaran (2009) specifies the necessity to incorporate in the expected cash flows, the probability the firm can cease to exist because of its crisis situation.

*Scenarios analysis* considers free cash flows estimates for all the possible scenarios, from the most optimistic to the most pessimistic, and assigns to each one a specific likelihood. Scenarios should reflect different assumptions regarding implemented strategies, macroeconomic environment and financing policies and should be supported by a feasibility analysis to avoid strategies difficult to achieve.

This process should be repeated for every period of forecasting horizon as the probability and the cash flows associated with every scenario change year by year.

$$Expected\ cash\ flow_t = \sum_{j=1}^n \pi_{jt}(Cash\ flow_{jt})$$

where  $\pi_{jt}$  is the probability that the scenario  $j$  will occur at time  $t$  and  $Cash\ flow_{jt}$  is the cash flow achievable by the firm in the specific scenario  $j$  at the time  $t$ .

However, the limit of this approach consists in the difficulty to determine for each forecasting period the numerous probabilities associated with each possible scenario as well as the cost to create several valuations. To overcome this limitation, Damodaran (2009) suggests to use a simplified form of this methodology which considers only two possible scenarios: the going concern and the distress scenarios. The version of Weyns et al. (2011), instead, includes three possible scenarios: the best, the worst and the most probable scenario.

If we adopt the approach of Damodaran, in the first case we assume that the continuity perspective will not be affected and the firm will be able to restore its going concern situation. Instead, the distress scenario includes all possible effects which derives from an insolvency

condition. In this case we can consider proceeds deriving from the liquidation process or the sale of a part of or all the firm's assets. The expected cash flow for each year of forecasting will be calculated as follow:

$$\text{Expected Cash Flow}_t = \text{Cash Flow}_{going\ concern,t} * \pi_{going\ concern,t} + \text{Cash Flow}_{distress,t} * (1 - \pi_{going\ concern,t})$$

Where  $\pi_{going\ concern,t}$  is the cumulative probability that the firm will survive until time  $t$ . In this case, the probabilities of default should be estimated for every year and the probability that the firm will survive until time  $t$  can be calculated as follow:

$$\text{Cumulative probability of survival}_t = \pi_{going\ concern,t} = \prod_{i=1}^n (1 - \pi_{distress,n})$$

where  $\pi_{distress,n}$  is the probability that the firm will result insolvent at the time  $t$ .

The main limits of this model concerns the difficulty to correctly estimate the cumulative probability of default for each forecasting period and to incorporate the assumptions, often contradictories, of going concern and distress scenarios.

Scenarios analysis offers a good support in presence of discrete risks, such as the approval or the rejection of the restructuring plan by the creditors or the possibility to obtain financing or not, but becomes less useful when we have to evaluate a continuous risk, such as sales or debt trends. In this case it would be more appropriate to use a model which makes use of a stochastic simulation for the most relevant variables of value. One of these approaches is the DCF model with Monte Carlo simulations that will be discussed in paragraph 2.6.2.

#### 2.2.5. Going concern DCF adjusted for the probability of default

An alternative to the previous DCF model concerns to separate the assumptions about going concern value from those which deal with the effects and consequences of distress. This simplifies a lot the work of the analyst and allows to make assumptions consistent with every scenario overcoming one of the main limits of DCF with scenarios analysis. In such a case, firm's enterprise value is equal to the weighted average between the going concern value and the liquidation value where, weights are based on the probability that the firm will result insolvent during the forecasting period.

Analytically, we can write the value of the firm as follow:

$$\text{Firm value} = \text{Going concern value} \times (1 - \pi_{distress}) + \text{Distress sale value} \times \pi_{distress}$$

where  $\pi_{distress}$  is the cumulative probability that the firm will result distressed during the valuation period.

The going concern value can be computed, considering only scenarios where the firm will survive, the ratio between debt and equity will decrease and the fiscal benefit will increase overtime (Damodaran, 2011).

An alternative, even if not so precise as the previous one, is to value the firm by observing other firms in the industry which are in good financial conditions. In this way it is possible to value the firm as in healthy condition by using average operating margins and the industry cost of capital. The risk of this approach is to overestimate the value of the firm by assuming implicitly that the return to financial health is oncoming and without consequences. The model can be refined when the analyst has access of more information and more accurate data.

*Liquidation value* or *distress sale value* can be computed by applying the method proposed by Dorigato e Aldrighetti (2009). Alternately, Damodaran (2009) suggests to introduce the following modifications when the external analyst does not have sufficient information:

1. Discounting value of the firm obtained from DCF method. However, the percentage discount to apply is of difficult determination.
2. Calculating value from expected cash flows without considering new investments and assuming that in case of liquidation the acquirer is available to pay only existing assets without considering the possible growth opportunities.
3. Applying a discount on book value of assets on the basis of historical transactions regarding comparable firms.

The last input required by the model is the estimate of the cumulative probability of default over the specific valuation period. It should be computed as follow:

$$\pi_{distress} = 1 - \prod_{n=1}^n (1 - \pi_{distress,t})$$

where  $\pi_{distress,t}$  is the probability that the firm will be distressed at the time  $t$ .

The probability of default can be determined through numerous methodologies which were presented in paragraph 1.6.1.

### 2.3. Adjusted Present Value

The relationship between capital structure and value is a typical argument in corporate finance. Several studies and researches, such as Modigliani and Miller (1958), Weston (1963), Altman

(1984), Chen (1995) and Altman and Hotchkiss (2006) demonstrated the central role played by the capital structure in the determination of firm's value.

DCF method with its adjustments requires to calculate WACC by assuming a target ratio between debt and equity. This approximation is quite unrealistic for firms with high leverage ratio that are implementing a restructuring plan. In this case the ratio between debt and equity is particularly uncertain and variable and its evolution cannot be excluded from valuation process.

*Adjusted Present Value (APV)* method takes explicitly into consideration the effects of the firm's capital structure and determine the levered value of the firm starting from its unlevered value and then adding the benefits and costs deriving from capital structure.

Theory for the application of this method can be found in the teachings of Modigliani and Miller who showed that without transaction costs and taxes, the choice about capital structure do not influence the firm's enterprise value, under perfect capital markets condition. In presence of taxation, the use of debt allow the firm to obtain a fiscal benefit, given the possibility to deduct interest payments from the taxable income. This will result in an enterprise value increase but, at the same time, the arising of distress costs.

Arzac (2005) showed two important consequences from a debt increase: first, it generates a positive effect on enterprise value in the form of tax shield, which is partly offset by a greater cost of equity because of the higher risk of distress. Second, we should also consider direct and indirect costs related to distress.

The traditional approach for the application of APV incorporates the leverage effects especially in their positive dimension. The unlevered value of the firm is determined on the basis of expected unlevered cash flows discounted at the cost of equity in absence of debt. Analysts add to this value the fiscal benefit of debt, calculated on the basis of the corporate tax rate and discounted either at the cost of debt or the unlevered cost of equity. The use of  $K_D$  and  $K_E$  depends on the riskiness attributable to cash flows. APV methodology gives appropriate results for the valuation of healthy firms but should be adequately adjusted to reflect the overall leverage effects during crisis.

### 2.3.1. APV method with probability and costs of default

Damodaran (2006) argued that in a crisis situation, the fiscal benefit of debt is significantly low or even absent, because EBIT is decreasing or negative without the possibility to achieve a tax shield. In addition, we have also to consider leverage effects on default risk as well as direct and indirect cost of default. So, the value of the firm using APV method can be synthesized as follow:

$$EV = \text{Unlevered value} + \text{Fiscal benefits of debt} - \text{expected costs from default} =$$

$$\sum_{i=1}^n \frac{FCF_{unlevered}}{(1+WACC_{unlevered})^i} + \sum_{i=1}^n \frac{\text{Tax shield}}{(1+k_d)^i} - PV(\text{costs of default})$$

where the first term represents the value of the firm financed only by equity, the second term is the value of tax shield on debt and the third term represents the value of the expected costs in case of default.

The assessment about default costs requires an estimation of the probability of default and the identification of direct and indirect costs which would arise in case of default. By using the formulation of Damodaran (2006) we can say:

$$PV(\text{costs of default}) = \text{probability of default} \times PV(\text{costs of default})$$

Damodaran (2006) suggests to consider the difference between the going concern value and the liquidation value of the firm as an estimate of default costs. Almeida e Philippon (2005) suggest that conventional measures for calculation of the costs of distress underestimate the true amount of these costs because they do not take into consideration that a corporate crisis is more accentuated during periods of recession or global market crisis. They support the idea that standard method for calculating the present value of costs of distress costs consists to multiply the estimates of the default costs with historical probability of default ignoring the effect of capitalization and discounting. Other studies, such as Altman (1984), suggest to discount the product between the historical probability of default of the firm and the costs associated with a risk-neutral probability. The use of the risk-free interest rate, according to some authors, underestimate the amount of these costs and, consequently, overestimate the firm's enterprise value. To take into account the greater market premium reflecting the real systematic risk, Almeida e Philippon propose to compute the present value of distress costs by adopting a risk-adjusted probability of default computed on the basis of *corporate bond spreads*.

This approach is based on the evidence that costs of default arise when the corporate bonds are not repaid back to the investors. Moreover, asset-pricing literature shows that there is a systematic component in the firm's risk of default. The adjustment requires to estimate the ex-post costs of default and to use corporate bond credit spreads to determine the *market-implied risk-adjusted probability of default*, increasing the impact of default on enterprise value.

This methodology requires the necessity to estimate correctly the probability of default of the firm and also to focus on the existence of income losses which do not enable to exploit the fiscal benefit of debt. For this reason, some professionals support APV method as a useful approach to evaluate firms with high leverage levels but, at the same time, they do not have any problem from an operating point of view. Another difficulty that we can face when we apply APV method concerns to estimate the value of debt in the long run. This limit can be passed by assuming that the firm aims to achieve a target capital structure in the long run. In particular, it is preferable to assume that at the end of the restructuring plan is able to maintain a determined level of debt overtime. In this case we can combine Adjusted Present Value method with Discounted Cash Flow method to value the firm (Arzac, 2005). More precisely, during explicit forecasting period, when the debt

value is more volatile and independent from the value of the firm, we can apply the Adjusted Present value while the terminal value is determined through the DCF formula and then discounted at the unlevered cost of capital in order to avoid double counting problem of debt.

#### *2.4. Multiple or relative valuation*

Different from the above mentioned methods is *multiple valuation (MV)*, which is based on the use of some multipliers derived from market prices of firms with similar characteristics.

Multiples are ratios between market capitalization and other economic or financial amounts selected from comparable firms. Value of the firm is obtained by multiplying the resulting multiples from comparables for the corresponding amount of the firm being valued.

MV has reached a widespread use because of its ease application and understanding. It requires less hypothesis and can be applied more quickly than models based on discounted cash flows. Furthermore, it permits to reflect closely market valuation.

These factors represents the strengths and at the same time weaknesses of this approach. The ease application can conduct to inaccurate results which do not take into consideration variables such as the risk, growth or potential cash flows. In fact, the recourse to market data, even if it can create estimates of value closer to actual market prices, affects valuation because it depends on the market capacity to price stocks correctly. For example, MV can be misleading when the market is undervaluing or overvaluing comparable firms. Furthermore, MV can lead to inaccurate valuation because future growth potential of the firm being valued are estimated indirectly through market prices of comparables. Finally, MV is particularly subject to manipulations due to the lack of transparency on the underlying hypothesis and the choice of comparable firms which can affect the final valuation results.

Koller (2010) suggests to use this approach in combination with other methods to verify the reliability of DCF valuation explaining the performance differences with respect to competitors and indentifying firms that the market believes are better strategically positioned than others.

According to the methodology described by Borsa Italiana (2004), relative valuation should be carried out considering the following phases.

1. *Sample selection.* The most tricky aspect in MV is the selection of comparable firms. The practical impossibility to indentify an homogenous group of companies creates the necessity to select comparable firms in relation to the most significant attributes of value. Generally, professionals proceed with three levels of analysis in this phase.

- At the first level, analysts should analyze comparable firms which operate in the same industry and country of the firm being valued because they are similar in terms of risk and long term growth perspectives. The analysis should be conducted by using as comparison parameters both quantitative criteria, such as ROIC, size, turnover, asset composition and capital structure, and qualitative factors, such as competitive positioning, ability to innovate and entrepreneurial formula. However, weaknesses in the home country make it difficult to select an accurate sample. For this reason, we should extend our analysis beyond the national boundaries.
  - An international comparison is preferable when there is developed financial markets with significant levels of liquidity and multiples are not affected by financial statements policies or fiscal policies of the specific countries.
  - The third level of analysis involves an inter-sector comparison, based on the effective possibility to identify firms which operate in different sectors but with the same risk profile and expected return.
2. *Choosing the most significant multiples.* Multiples used in the valuation should be coherent. This means that numerator and denominator should belong to the same category and make reference to the same elements.

We can distinguish multiples into two categories: multiples which belong to *equity side* and those which belong to *asset side*.

Equity side multiples are ratios where numerator expresses the value of firm's equity.

The most used are:

- *P/E (Price per share/earnings per share)*: it is the most known multiple but it can lead to misleading results as P/E is affected from financial statements and fiscal policies as well as by debt amount.
- *P/CF (Price per share/cash flow per share)*: cash flow is computed as the sum of net income, depreciation charges and provisions.
- *P/B (Price per share/book value of equity per share)*: it is difficult to use when firms adopt different financial statements policies as shareholders' equity becomes not comparable.

The numerator of asset side multiples is the firm's enterprise value. The most widely used asset side multiples are:

- *EV/EBIT (enterprise value/earnings before interest and taxes)*
- *EV/EBITDA (enterprise value/earnings before interest, taxes, depreciation and amortization)*



- *EV/EBITA* (*enterprise value/earnings before interest, taxes and amortization*)
- *EV/V* (*enterprise value/sales*): it presents the same limits of the *P/V* multiple but it is often used in case of companies with negative margins or net income.
- *EV/OF CF* (*enterprise value/operating free cash flow*)

The use of asset side multiples lead to an estimate of the firm's value, from which we should deduct market value of debt to obtain value of equity.

The best multiple is that which better reflect the capacity of the target firm to create value. In the valuation practice there are also some multiples which consider growth prospects of target firm, such as *PEG ratio* (the ratio between the price per share and the net income growth rate) or *EV/EBITDAG* (where the EBITDAG is the ratio between EBITDA and net income growth rate), and multiples which make reference to off-book items which have a very strictly relationships with the main key value drivers.

3. *Calculation of selected multiples for comparable firms.* Multiples are generally calculated on the basis of financial data of the current year or those expected for the next year. However it is possible to choose different time horizons depending on the specific firm's situation and the valuation context.
4. *Multiples calculation of the firm being valued.* Multiples for every firm in the sample is used to determine the value, or the interval of values, of the same multiples of the target firm. The mean or the median are often used for this purpose. Frequently, this value is calculated as a weighted average where the greater weights are applied to comparable firms that are considered more similar to the target firm.
5. *Application of multiples.* Multiples obtained from comparable firm to the corresponding economic and financial amounts of the firm being valued for the determination of an interval of values of the firm's equity.

#### *2.4.1. Application of multiples to firms in crisis*

Corporate crisis condition makes much more difficult to adopt multiple valuation. Generally, in a distress situation it is preferable to use asset side multiples. The most appropriate many times is *EV/EBITDA* because it focuses on operating performance of the firm and its determinants. On the contrary, equity side multiples are affected by capital structure of comparable firms and, for this reason, they are not appropriate for the valuation of firms with high leverage ratios and facing restructuring process. Moreover, the application of multiples to firms in crisis is possible only if the amounts are positive and thus this methodology can be applied only for valuation of firms that

face earlier stages of a crisis. The most advanced phases of corporate crisis are characterized by a deterioration of profits, equity and operating performance which makes it impossible the use of equity side multiples.

The unique multiples which can be applied in this case are those connected with sales. However, these multiples, as already specified, give poor information on margins and other fundamentals of value.

Damodaran (2009) proposes two MV adjustments in order to take into account distress effects. These adjustments, however, tend to be more approximated than those described for the DCF approach even if they improve valuation accuracy.

The first modification implemented by Damodaran consists to include in the sample only firms in trouble to see how much the market is available to pay for them. In theory, this approach improve the valuation process but it can be applied only when the crisis hit simultaneously several firms in the same industry. Furthermore, by classifying firms as distressed or not distressed, the risk is to treat in the same way firms at different phases of the crisis path, with significant consequences in terms of valuation. In this case it would be preferable to amplify the sample by extending the analysis on the entire market and considering all the firms in crisis. The problem in this case is related to the likely presence of firms significantly different from the target firm at which the market assigns an higher or lower value.

The second modification introduced by Damodaran to take into account the effects of distress in the relative valuation consists to determine multiples for all the firms in the sample (including the healthy firms) and then group them according to the bond rating of companies. In this way it is possible to determine multiples for each bond rating and measuring the discount rate applied by the market depending on the degree of crisis faced by firms. In case the firm being valued is distressed and operates in a industry which are not hit by the crisis, it is not possible to directly use market data from healthy competitors. In this case, we should explicitly consider the probability of default of the target firm. As suggested with the DCF approach, we can determine enterprise value of the distressed target firm as weighted average of going concern value (in this case determined through relative valuation) and liquidation value.

$$\text{Enterprise value} = \text{Going concern relative valuation} (1 - \pi_{\text{distress}}) + \text{liquidation value} * \pi_{\text{distress}}$$

Finally, it is preferable to use *forward multiples*, calculated on future data instead of historical ones. In this way it is possible to value the long term perspective of the business by eliminating the non-recurring past events. Since these multiples are build up on future perspective, it is necessary to take into account investments and extraordinary costs required to restructure firm's assets which affect future valuation results.

## 2.5. Option Pricing Valuation

Valuation methods considered so far constitute adjustments or modifications of traditional valuation methods which allow analysts to determine enterprise value of the firm during the particular situation of corporate crisis.

*Option pricing valuation (OPV)* is a valuation method based on the application of the options logic. In particular, this method enables to justify, under certain circumstances, the reason why some stocks are priced positively, even if the value of equity appears to be negative.

The option pricing approach was initially proposed by Fisher Black and Myron Scholes (1973) and then subsequently developed by Merton (1974). The idea at the basis of this methodology is that equity of a firm can be viewed as an option on the value of firm's assets.

In fact, in the great part of companies equity assumes two characteristics:

1. Shareholders can decide in every moment to liquidate firm's assets and pay back debt leaving the control to creditors.
2. Shareholders enjoy the *limited liability principle*, so they cannot lose more money than those they invested in the firm.

The combination of these two characteristics allow to assimilate equity to a *call option* on the firm's assets value with a *strike price* equal to the face value of debt. Alternatively, we can say that holding debt of a risky firm is equal to hold a risk-free debt and signing a *put option* on the firm's assets value. At the debt maturity, if the firm's value is greater than face value of debt, shareholders can reimburse debt to creditors and maintain the control of the firm. On the contrary, if the value of assets is lower than the value of debt at the maturity, shareholders will exercise the option to declare bankruptcy leaving out the control of the firm in the hands of creditors. In this case, given the limited liability principle, creditors cannot use shareholders' personal heritage for satisfying their credits.

So *payoffs* to equity holders on liquidation can be written as follow:

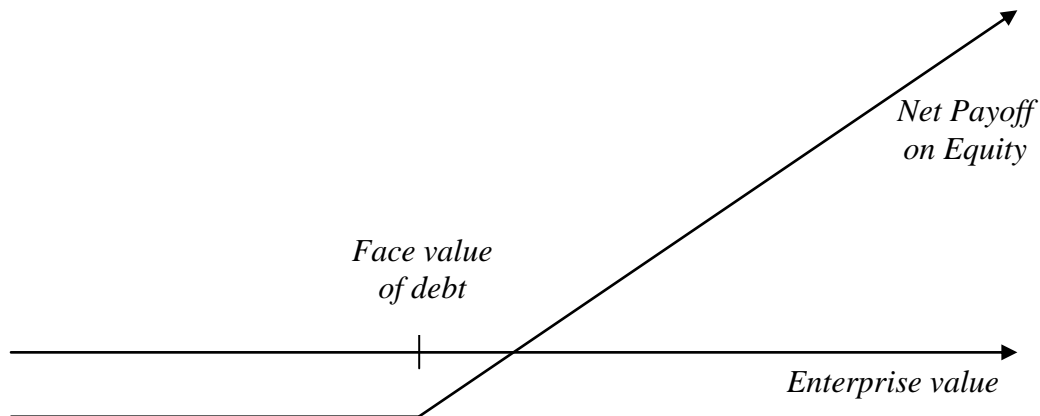
$$\text{Payoff to equity on liquidation} \begin{cases} V - D & \text{if } V > D \\ 0 & \text{if } V \leq D \end{cases}$$

where  $V$  is the firm's value and  $D$  is the face value of outstanding debt and other external claims.

Analytically, the value of equity and debt can be written as follow:

$$\begin{aligned} \text{Value of equity} &= \text{Max} [ V - D ; 0 ] \\ \text{Value of debt} &= \text{Min} [ V ; D ] \end{aligned}$$

Figure 3.6. - Payoff on Equity as Option on a Firm (Damodaran, 2009)



The application of option pricing methodology requires the assumption of some significant hypothesis:

1. There are only two types of investors: debt holders and shareholders.
2. There is only one issue of debt and it can be retired at the face value.
3. The debt has a zero coupon without other special features (convertibility, put clauses, etc.).
4. Enterprise value and its variance can be estimated.

Under such an assumptions, the value of equity of the firm can be calculated through the *Black-Scholes and Merton model* (BSM model) as follow:

$$\text{Equity value} = S * N(d1) - D * e^{(r_f \times T)} * N(d2)$$

$$d1 = \frac{\ln\left(\frac{S}{D}\right) + \left(r_f + \left(\frac{\sigma^2}{2}\right)\right) * T}{\sigma * \sqrt{T}}$$

$$d2 = d1 - \sigma * \sqrt{T}$$

where:

- $S$  is the enterprise value
- $D$  is the face value of debt
- $r_f$  is the risk-free rate
- $\sigma^2$  is the variance of enterprise value
- $T$  is maturity of debt.

According to Damodaran (2009) the value of the firm ( $S$  in BSM model) can be calculated through four different methods:

1. As the sum of market value of stocks and bonds assuming that all debt and equity are traded in the market. As explained by Damodaran, this approach, while simple, is in-

herently inconsistent because it starts with one set of market values for equity and debt and then, using option pricing theory, ends up with entirely different values for each.

2. Discounting expected cash flows at the cost of capital by using DCF formula and keeping in mind to consider only cash flows deriving from existing investments. Enterprise value in OPV is the firm's liquidation value that should be determined considering that potential acquirers are not available to pay for returns derived from future investments.
3. Using multiples on revenues that are indicative of the capacity of healthy firms to generate revenues in a specific industry.
4. Summing up the market value of individual assets of the firm when these assets have a market price.

Enterprise value volatility for listed firms can be calculated through the following formula:

$$\sigma^2 = w_E^2 \sigma_E^2 + w_D^2 \sigma_D^2 + 2w_E w_D \rho_{ED} \sigma_E \sigma_D$$

where  $w_E$  and  $w_D$  are the weights of equity and debt respectively,  $\sigma_E^2$  and  $\sigma_D^2$  is the variance of equity and debt respectively and  $\rho_{ED}$  is the correlation coefficient between the stock price and bond of the firm. In case of distressed firms, this approach can be misleading because the stock price and the bond price become highly volatile. So it would be preferable to use an average variance of enterprise values of other comparable firms in the industry.

The life of the option used in BSM model must coincide with debt maturity. Many firms have a capital structure composed by several types of debt and with different maturities. So it is valuable to convert different bond issues in an equivalent zero coupon debt in such a way the assumptions required by the model are satisfied. The alternatives proposed by Damodaran consist to average durations or maturities of each bond, weighted by their face value.

When there is more than one debt issue, the analyst can determine face value of debt ( $D$  in BSM model) by choosing among one of the following methods:

1. Summing up the reimbursement amount of each bond at maturity. This approach, however, underestimates the true amount of debt because interest payments due to creditors are ignored.
2. Adding to face value of debt the amount of coupons and other interest payments until the maturity. The main problem of this method is related to the different time horizon at which such cash flows will take place.
3. Considering cash flows paid to debt holders as the sum of face value of debt and interest payments expressed as percentage on the enterprise value

One of the main strengths of option pricing model is that it allows to estimate *risk neutral probability of default* which is the probability that the firm will be unable to fulfill its debt payments at maturity.

$$\text{Risk neutral probability of default} = 1 - N(d_2)$$

Another advantage of this method consists in the possibility to assign a value to the uncertainty and the future opportunities. In fact, value of equity can be positive even if enterprise value is lower than face value of debt. This occurs because even if in case of an immediate liquidation the value of equity is negative, enterprise value volatility and future debt maturity give the possibility that value of assets underlying the option can increase and become higher than the value of debt. So, equity has a *time premium* that makes it positive. Even in DCF valuation with scenarios analysis value of equity recalls the concept of a call option. But in this case the positive value of equity derives from assumptions underlying each scenario and the probability associated with it. So, the results of traditional valuation techniques, unlike OPV, depends on the accuracy of projections.

## 2.6. Other valuation methods

Capital Cash Flow model and the DCF model with Monte Carlo simulation are two additional valuation methods that can be used to value distressed and declining firms. These models are not so commonly used as the previous ones but they work well in a distress or decline scenarios.

The main features and peculiarities of these methods are presented in the following two paragraphs.

### 2.6.1. Capital Cash Flow model

*Capital Cash Flow model (CCF model)* resented by Ruback (2000) is an alternative method for the valuation of firms characterized by significant uncertainty underlying expected cash flows. CCF model uses the same assumptions underlying DCF model but includes value of tax shield on debt in the calculation of free cash flow. For this reason, free cash flows are discounted at pre-tax cost of capital. As mentioned above, WACC is affected by changes in the capital structure and this creates difficulties to apply DCF approach to firms with high leverage or facing restructuring process because capital structure can change very quickly. In these cases, capital structure and the corresponding WACC should be estimated for every year of projection, increasing the complexity of valuation.

CCF model is based on cash flows available to all investors, including tax shield originated by the deductibility of interest payments. Since fiscal deductibility of interest payments is included in the capital cash flow calculation, the appropriate discount rate is a before tax interest rate which represents the riskiness of assets irrespective of capital structure. The advantage of CCF model is its simple application, especially when projections on debt are difficult and when debt and the leverage ratio are subject to significant variations during the projection period.

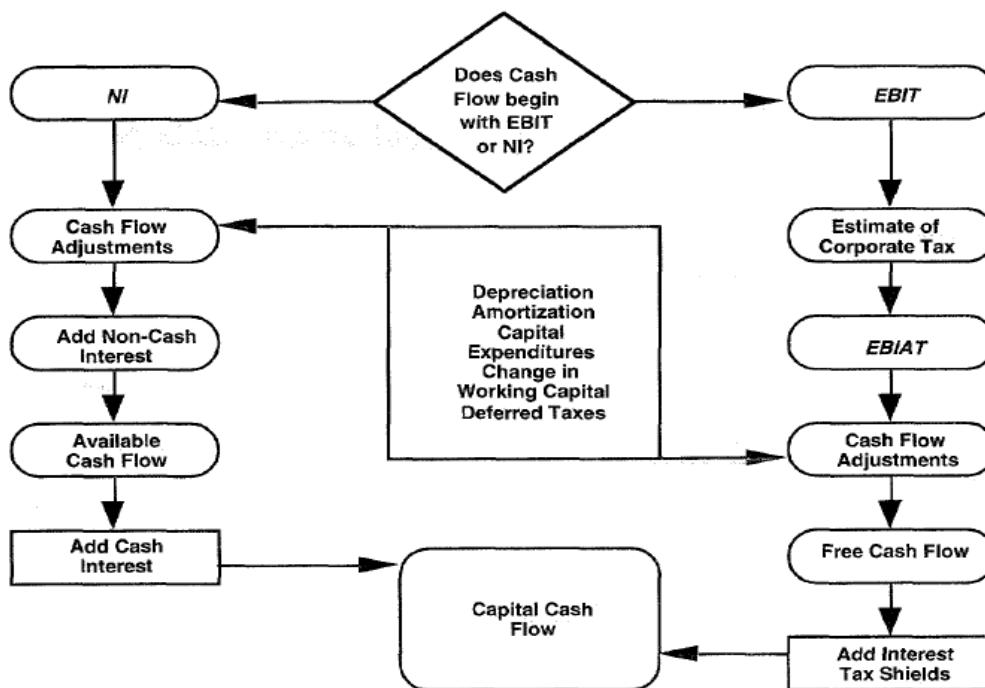
As shown by Ruback (2000), CCF and DCF models often give similar results but the application of CCF model reduce significantly the operating complexity and the possibility of errors.

CCF approach is also known as *compressed APV* (Arzac, 2005), despite the different treatment of tax shield on debt. In the APV method, tax shield is discounted at the cost of debt, while in CCF methodology they are discounted at the unlevered cost of capital. Given greater value of tax shield on debt, enterprise value will be higher under APV technique with respect to CCF methodology.

The value of the firm calculated with the CCF methodology, will be equal to the present value of projected capital cash flows, discounted by the expected return rate on assets ( $K_U$ ) plus a terminal value which represents the value of cash flows ahead of the projections period.

Capital cash flows can be calculated starting from net income or EBIT, as illustrated in the following figure.

Figura 2.3. - Capital Cash Flow determination (Ruback, 2000).



As net income already includes fiscal benefit of debt, it is sufficient to consider cash flow adjustments (depreciations, amortizations, deferred taxes, capital expenses and change working capital

variations) and non-cash interest to determine the available cash flows for creditors and shareholders. Capital cash flow is given by the sum of the available cash flow and cash interest.

The second methodology of calculation follows the traditional approach for determining free cash and then includes the value of tax shield to obtain the corresponding capital cash flow.

Terminal value is calculated by assuming that capital cash flow in the last year of projection grows at a constant and perpetual rate.

Gilson, Ruback e Hotchkiss (2000) showed that empirically 79% of firms in trouble record *net operating losses carry forward (NOLs)* at the end of the projection period. These net operating losses can be deducted by future profits with the effect to reduce taxes. However, this advantage cannot be included in the terminal value formula as it can be used only for a limited time horizon. So, it is preferable to divide the terminal value calculation in two parts: the first which considers an extension projection period when there is the possibility to use the fiscal advantage of net operating losses carry forward, and the second in which terminal value is determined by using the traditional perpetual formula.

The capital cash flow during the extension period can be computed through the following formula:

$$CCF = EBIT - \text{Estimated corporate tax} + \text{Cash flow adjustments} + \text{Tax shield due to NOL}$$

where:

- *Estimated corporate taxes* =  $(EBIT - \text{interests}) * \text{tax rate}$
- *Tax shield due to NOL* is estimated from the minimum between *earnings before taxes (EBT)* and *residual NOL* multiplied by the corporate tax rate.

Capital cash flows and terminal value are discounted by using the unlevered cost of capital of the firm. This is a pre-tax interest rate, because the fiscal benefit of debt has been already included in the calculation of CCFs. The unlevered cost of capital of the firm can be calculated as follow:

$$K_U = r_f + \beta_U(r_m - r_f)$$

where  $r_f$  is the risk-free interest rate,  $\beta_U$  is the unlevered beta of the firm and  $(r_m - r_f)$  is the risk market premium.

To measure the systematic risk of the company, represented by  $\beta_U$ , historical returns of firm's stock are generally used. In case of declining or distressed firms,  $\beta_U$  estimated in this way is useless as historical returns of firm's stocks become negative as the observations are closer and closer to financial crisis status and they differ significantly from the expected return by shareholders. Moreover, as the firms in distress often face restructuring process, historical performance becomes less relevant.

To estimate  $K_U$  we can apply the following formula (Ruback, 2000):



$$\beta_U = \frac{D}{V}\beta_D + \frac{E}{V}\beta_E$$

where  $\frac{D}{V}$  and  $\frac{E}{V}$  are respectively the weights of debt and equity on the enterprise value,  $\beta_D$  is the beta of debt and  $\beta_E$  is the beta of equity.

The methods of CCF and DCF, as we saw before, are based on the same assumptions and information, so if they are correctly applied they lead to the same valuation results. Generally, Koller et al. (2010) consider DCF model preferable than CCF because, maintaining NOPLAT and free cash flows independent from capital structure allows a better valuation of operating performance. Ruback (2000) suggests to use the DCF model for the initial valuation of the firm, when there is not a detailed and well developed financial plan and when we can assume a constant capital structure. CCF method results more accurate when analysts have detailed financial information and the firm has a complex fiscal situation. In many situations of restructuring, leverage buyout or bankruptcy the use of CCF method facilitates the valuation.

Regarding the choice between CCF and APV method, Ruback argued that CCF is most appropriate when debt is proportional to the firm's enterprise value while APV when a steady level of debt, independent from the firm's value, is assumed.

The best valuation method depends on the firm's financial policies and situation.

#### *2.6.2. DCF model with Monte Carlo simulations*

DCF method with the adjustments illustrated in paragraphs 2.2.4. and 2.2.5 can be classified as deterministic because enterprise value is estimated by assigning predefined values to the key valuation variables, such the sales growth rate or operating margins. In reality, each of these variables can assume a distribution of values and the choice to consider only the expected value of the distribution can represent a significant limitation in presence of situations characterized by great uncertainty, as a distressed firms. One solution for this problem consists to use a statistic simulation which take into account the entire probability distribution to reflect the degree of uncertainty for every input in the valuation model. In this way, analysts move from a deterministic to a stochastic model and, by applying Monte Carlo technique, they can determine the enterprise value of the firm.

*DCF model with Monte Carlo simulations* is made up by three phases: model creation, simulation e outcome interpretation. Each of these phases involve several steps that are analyzed in the following points.

### 1. First phase: model creation.

- *Step 1.* First step consists to analyze the firm and the industry in which it operates. The analyst should analyze historical data and future perspectives of the firm and the industry with the aim to identify dynamics, specific value drivers and to select key variables (such as sales growth rates or operating margins) that will be transformed in a stochastic form. Obviously, the greater is the number of variables expressed in stochastic form, the higher will be the level of difficulty and the time required for the calculation.
- *Step 2.* The analyst has to choose the probability distribution or the stochastic process which better fit the dynamics of key variables identified previously. Most used probability distributions and stochastic processes are synthesized in the following table.

*Table 2.1. - Possible distribution and stochastic processes*

| <i>Probability distribution</i> | <i>Stochastic process</i> |
|---------------------------------|---------------------------|
| Normal distribution             | Geometric Brownian Motion |
| Exponential distribution        | Mean-reversion process    |
| Geometric distribution          | Two-three factors model   |
| Lognormal distribution          | Markov chain process      |

The choice among different distributions depends on the range of possible values which can be assumed by variables under analysis. For example the variable which describes the revenues cannot be described by a normal standard distribution as revenues cannot assume negative values. Moreover, the choice should be accompanied by an historical data analysis. The distribution choice will be much more accurate the greater is the time horizon under analysis as it incorporates booms and recessions with low probability but with high valuation impact.

- *Step 3.* After the identification of key uncertainty factors and their stochastic form, the analyst should estimate parameters for all the selected distributions. Parameters are usually estimated starting from historical data and then taking into account future corporate perspectives. Estimates should be made with accuracy and prudence. During this step, analyst should establish the circumstances under which the firm can be considered in default in order to classify the outputs of simulations between the cases of default or survival.

### 2. Second phase: simulation.

- *Step 4.* Starting from the identified probability distribution and stochastic processes for each simulation, a value is assigned randomly to every relevant variable. In some cases, to increase valuation accuracy it is appropriate to introduce a correlation coefficient among variables which represent interconnections. For example, the probability to obtain negative margins increase in presence of a low sales growth rate.
- *Step 5.* The output obtained from simulations are included in the valuation model for arriving at the estimates of expected cash flows. If estimated cash flows meet the previously identified criteria for the hypothesis of business continuity, they are discounted at the cost of capital to determine the enterprise value of the firm with the traditional DCF methodology. On the contrary, when scenario is classified as default, specific valuation procedures for distress are applied.
- *Step 6.* Step 4 and step 5 are repeated until a sufficient number of simulations, and thus potential corporate realizations, are obtained. In general, the more complex distributions are, the greater is the number of simulations required because they require the estimation of many parameters or parameters can assume a wide range of values.

### 3. *Third phase: outcome interpretation.*

- *Step 7.* Distribution of enterprise value of the firm is derived from going concern and distress values obtained with simulations. The expected value of enterprise value distribution is the value of assets for the firm being valued. Starting from these data is possible to calculate probability of default and distress effects on value for the firm.

Although this methodology gives more accurate results than traditional valuation models, this approach is not very commonly used by analysts because of its complexity and the amount of information required. In fact, the choice among distributions which describes key variables and the estimation of parameters are particularly difficult and the results produced by the model are entirely based on the accuracy of these estimates. A further limit is the time required to implement simulations which, although there is the possibility to use statistic software, is longer than other traditional valuation methodologies.



## **CHAPTER 3 - Bialetti crisis analysis**

### *3.1. Introduction*

The objective of the thesis is to apply the most suitable models to value firms in trouble and to analyze the performance of such models in a real-life case setting. Bialetti case has been chosen because it has the representative characteristics of a firm that progressed from entering the declining stage to facing financial distress. Over the course of this development the company faced all the major risks and challenges which makes particularly difficult to perform a valuation.

This chapter is dedicated to the financial statements analysis of the Bialetti Group in the last ten years. The aim of this analysis is to have a clear understanding of the current financial situation of the Group and how the restructuring process carried out by the management in the last years affected the Group's performance and value.

Bialetti Industrie S.p.A. is the holding company of Bialetti Group, one of the major operators in international markets for the manufacturing and marketing of cookware, small appliances, coffee machines and capsules. The Group owns several brands with a lot of tradition and great fame, such as Bialetti, Aeternum, Rondine and CEM. Bialetti brand is involved in the production and distribution of traditional coffee pots, electric coffee machines, wide range of coffee capsules as well as cooking tools and accessories for confectioners. Aeternum, Rondine and CEM brands are involved in the segment of cooking tools and kitchen accessories.

Bialetti's commercial structure covers all major markets and operates via the Headquarter in Coccaglio, in the north of Italy, and an important commercial centre in Paris (France). The Group is known worldwide for the high degree of innovation and quality expressed in its products as well as for the use of new materials and technologies. Italian know-how is applied all the production plants in Italy, Romania, China and Turkey, where the commercial branch is based.

Bialetti Group is also engaged in the retailing activities through the subsidiary Bialetti Store s.r.l.. More precisely, Bialetti Store operates through single-branded shops and outlet village structures. On 31st December 2015, Bialetti Store counts 130 shops, of which two of them based in France and Spain.

The chapter starts with the presentation of the Group and its history from the foundation in 1919 to 2007 when Bialetti Industrie was listed in the Italian Stock Exchange and the first signals of the crisis started to appear.

Paragraph 3.3. focuses on the crisis that hit the Group since the last months of 2007. During this analysis the main phases of the corporate crisis will be retraced together with the main actions implemented to restore the normal going concern condition. The economic and financial analysis of the Group in the period 2006-2015 is reported in paragraph 3.4 where the main financial statements amounts and ratios are compared with a benchmark competitor.

The chapter concludes with a description of the current situation of the Group and the main risks which can obstruct the realization of Industrial Plan 2014-2017. These risks and uncertainties represent a fundamental basis for the valuation process that will be performed in the subsequent chapter.

### *3.2. Structure and history of Bialetti Group*

The company was born in 1919 when Alfonso Bialetti opened a workshop in Crusinallo, a small village in the north-west of Italy, for the production of semi-finished goods in aluminium. After few years the workshop turned into a studio for designing and producing finished items using shell moulding.

The company reached its peak in the years before World War II, after the founder in 1933 invented *Moka Express*. This was a revolutionary idea that transformed the art of making coffee into an action so simple and natural that it has become an essential rite in every Italian home. For almost 90 years Bialetti revolutionized the pleasure of making coffee, and thanks to its expertise it continued to evolve and renew its products. Still today, it is an example of experience and goodwill with products that are functional, with great technique and reliability, modern design and outstanding quality. The mission of Bialetti Group is "*To be competitive, innovative, and to create value not only by efficiency in developing and manufacturing new products, but also by continually satisfying the needs of consumers and clients.*"

Nowadays the Group owns about 319 trademarks, holds 127 patents for invention, 11 utility models and 212 ornamental and industrial design models. It dedicates significant internal and external resources to research and development of new products and technologies through a flexible structure and a series of well-established partnerships with professionals, design institutes, universities and research centers.

After the death of Alfonso Bialetti in 1970, his son Renato took over the company. However during Seventies, the company started to suffer the first crisis signals caused by the competition of coffee pots producers from low-cost countries.

In 1980, Bialetti, which had 200 employees and 20 billion lire turnover, was sold to Faema. The new ownership started a diversification of productive activities through the launch of small appliances product line.

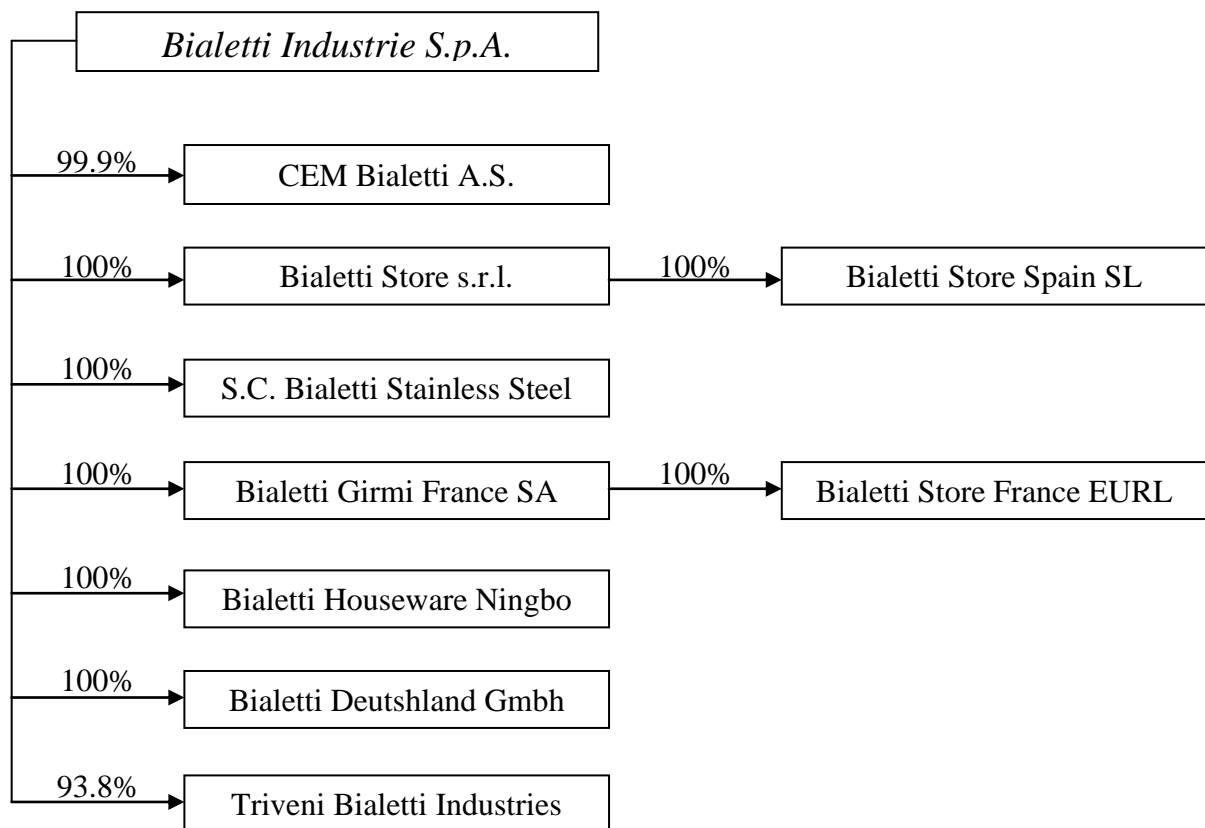
In 1993 the company was sold again to Rondine Italia, an Italian company engaged in the cookware manufacturing based in Coccaglio (Brescia) and owned by Ranzoni family.

Bialetti Industrie S.p.A was born in 1998 from the merger between Bialetti and Rondine.

Starting from the year 2000, Bialetti started expanding through several M&A deals, such as the acquisition of Pres-metal Casalinghi and Gb-Guido Bergna. In 2005 , the Group took over Girmi, a known Italian manufacturer of small household appliances, and CEM, a leading company in Turkey for the production and marketing of cooking tools. The following year Bialetti Industrie acquired Aeternum, one of the most known brands in the steel production. On 27th July 2007, Bialetti Industrie makes its entry into the Italian Stock Exchange.

The actual structure of the Group is the following:

Figure 3.1. - Structure of Bialetti Group



Bialetti Industrie S.p.A. is the holding company of Bialetti Group and its ownership is composed as follow:

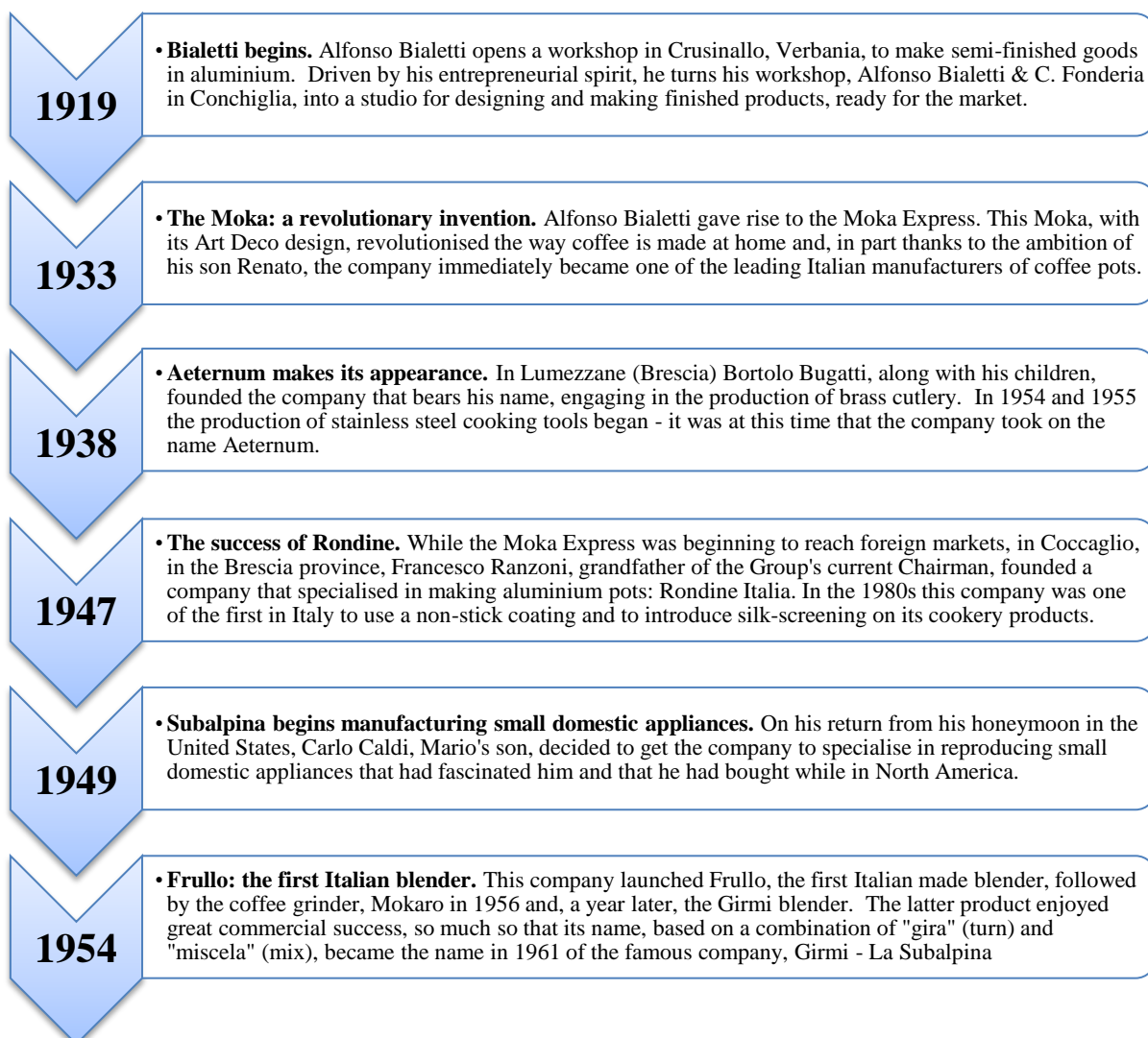
- *Bialetti Holding s.r.l.* owned and managed by Francesco Ranzoni (64.75%)
- Free float (28.19%)
- Diego della Valle & C. S.a.p.a. (6,94%)
- Treasury shares (0,15%)

The Board of Directors is composed by the following people: Francesco Ranzoni (President), Roberto Ranzoni, Elena Crespi, Ciro Timpani and Antonella Negri Clementi.

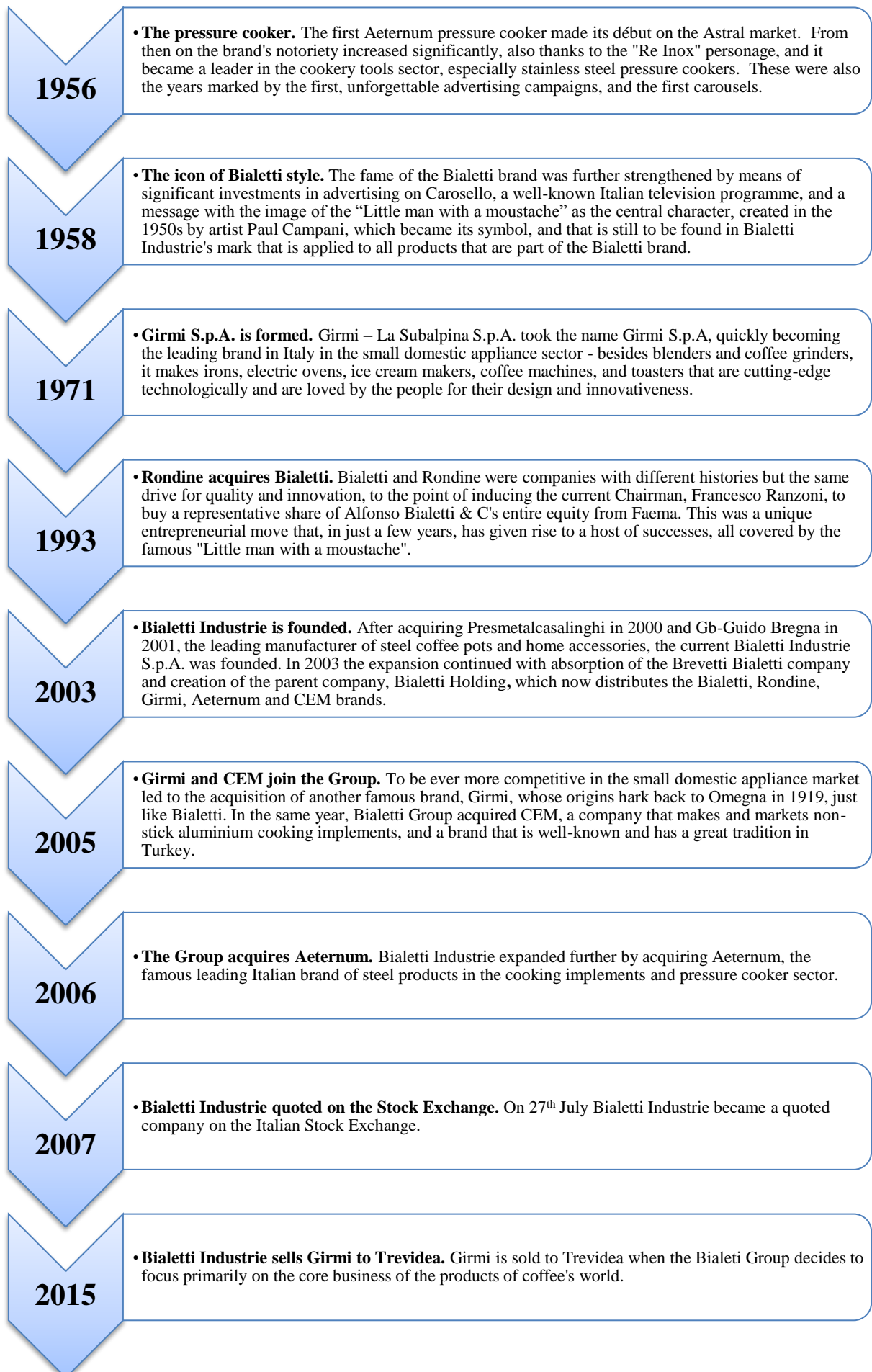
The Audit Board, instead, is composed as follow: Giampiero Capoferri (President), Diego Rivetti, Luciana Loda.

To better understand what Bialetti means for Italian people, a study conducted in 2010 calculated that about 90% of Italian families have at least one Bialetti coffee pot. The milestones of Bialetti Group are illustrated in the figure 3.2.

Figure 3.2. - Bialetti Group milestones







### 3.3. Bialetti's crisis

Although probably influenced by other reasons, Bialetti decline is first attributable to the company's failure to capture changes in the customers' needs and to adapt its products and distribution. In other words, Bialetti is the traditional example of how changing industry conditions and the emerging of substitute products can push a company into the declining stage of industry life cycle. Although initially hesitant, the management introduced several turnaround strategies aimed at repositioning the company in order to focus on retail channel and premium products.

However, these restructuring measures were not initially sufficient to boost falling sales and the Group recognized net income losses from 2008 to 2013. A positive net income of about € 1.0 million occurred only in 2012.

On 27th October 2011 Bialetti was included in the *CONSOB Black List*. All companies included in this list have the obligation to inform the market with a monthly report about the evolution of the business and net financial position.

Before starting to analyze the economic and financial Bialetti's conditions for an appropriate valuation, there is the need to clearly understanding the main steps of its corporate crisis. This is a fundamental part of the valuation process because it is very difficult to make precise assumptions about the future without knowing the history and peculiarities of the company.

Events that characterized the last decade of the Group can be reorganized in three different phases:

1. *Crisis and downsizing (2008-2011)*. In this period the crisis became more and more evident because of the difficult macroeconomic scenario which significantly affect the customers' demand.
2. *Relaunch (2011-2014)*. In this phase the management of the Group started several interventions with the objective to boost revenues, reduce operating costs and improve the financial conditions of the Group.
3. *Development (2014-2015)*. In this phase the relaunch interventions started to produce the expected results and the new business model allows the company to restore the normal going concern condition.

#### 3.3.1. Downsizing phase

First signals of crisis was perceived by the Group in the last quarter of 2007. At the end of 2007 the Group recorded a consolidated net income of € 4.1 million and a more than five per

cent revenue growth. However, beside these positive results, the industry competition started increasing and sales realized abroad recorded a significant fall, especially in Western Europe and North America. Probably management underestimated these negative signals and it did not intervene appropriately to face the global financial crisis that hit the consumption in the following years.

Together with the negative macroeconomic scenario, wrong management choices worsened the Group conditions. In fact, during 2007 and 2008 the company decided to make significant investments to increase the total productive capacity of operations by realizing a new productive plant in Mumbai (India). However, a more conservative strategy would be most appropriate in a scenario characterized by weak consumption levels and increasing price competition. In 2008 the Group recorded significant income loss of about € 23.5 million and a turnaround decrease of about 5 per cent. Despite these negative results, the Group proceeded the construction of new plant in Mumbai with the expectation of a sales improvement in the following years. This investment contributed to a net financial position deterioration from € 90.9 million in 2007 to €114.5 million in 2008.

In the same year the Group started a productive and organization restructuring. In particular, the Group implemented outsourcing strategies for lower value added activities such as the assembly of coffee pots and the logistics of finished goods inventory.

The restructuring process also involved a significant personnel reduction. More precisely, total labor force of 903 employees in 2007 was reduced by 10 per cent during 2008.

In 2009 global recession characterized by a dramatic fall of consumption inevitably affected Bialetti's performance.

The Group recorded a negative income of € 9.8 million with a turnaround decrease of about 8 per cent with respect to the previous year.

On 9th february 2009, Bialetti Holding s.r.l., Bialetti Industrie S.p.A, Bialetti Store s.r.l. signed the first *standstill agreement* with creditor banks representing more than 90% of the consolidated net financial position. The main terms of the standstill agreement are:

- Confirmation of short and long term credit lines until 30th April 2010.
- Suspension of all the principal amount payments with a maturity less than 30th April 2010.

In exchange of the stanstill agreement, creditor banks asked to Bialetti Holding s.r.l. to approve a capital increase of at least € 8.0 million. In the same agreement the parties agreed to fix some covenants that, if not met, determine the termination of the contract.

On 30th June 2009, Bialetti's Board of Directors approved the Industrial Plan 2009-2011 for the relaunch of the Group. At the same date Bialetti Holding communicates to the market the

intention to provide new finance to Bialetti Industrie through a capital increase of € 8.0 million.

During 2009, the restructuring and simplification process, started in the previous year, continued:

1. The new plant in Mumbai was shut down at the end of 2009 after the assessment that the Group's productive capacity was excessive with respect to demand level during recession. From an economic point of view, this wrong initiative costs to the Group about € 5.7 million.
2. Many productive activities were outsourced to external suppliers in order to increase the focus on the remaining core business activities.
3. Productive and administrative employees were reduced both in Bialetti Industrie and Girmi. The number of employees decreased from 903 in 2008 to 813 in 2009 at the Group level.

At the end of 2010, consolidated sales amount to € 184.5 million with a decrease of 5 per cent with respect to the previous year. Moreover, another great income loss of about € 18.5 million resulted from Consolidated Income Statement of that year. The net result was significantly affected by non-recurring and extraordinary items for an amount of € 10,0 million originated by the simplification and rationalization interventions.

On 27th April 2010, Bialetti Holding provided the entire cash consideration of € 8 million necessary to increase Bialetti Industrie capital as agreed with creditor banks in the standstill agreement. In May 2010, the Group also agreed with the creditor banks to extend the force of the standstill agreement until 31st December 2011 under the condition to respect the following covenant: NFP/EBITDA lower than or equal to 6.

However, on 31st December 2010, the Group recorded a negative EBITDA for about € 2.7 million. This caused the covenant breach and the beginning of a new negotiation phase with banks to maintain the liquidity necessary to finalize the restructuring process.

Board of Directors decided on 7th April 2010 to close the historical plant in Omegna. This decision was taken after the consideration of a significant fall of traditional coffee pots demand which represented the historical business of the Group (-26 per cent in 2009-2010) because of the competition of new producers from low-cost countries. Coffee pots business was no longer viable for Bialetti as it required to sustain a great amount of fixed and indirect costs that could not be recovered by the actual sales level.

On 13th December 2010, Bialetti's management decided to perform a merger between the subsidiaries Girmi and Sic. This merge allowed to concentrate all the Italian activities of the Group (with the only exception of the distribution and retail activities performed by Bialetti

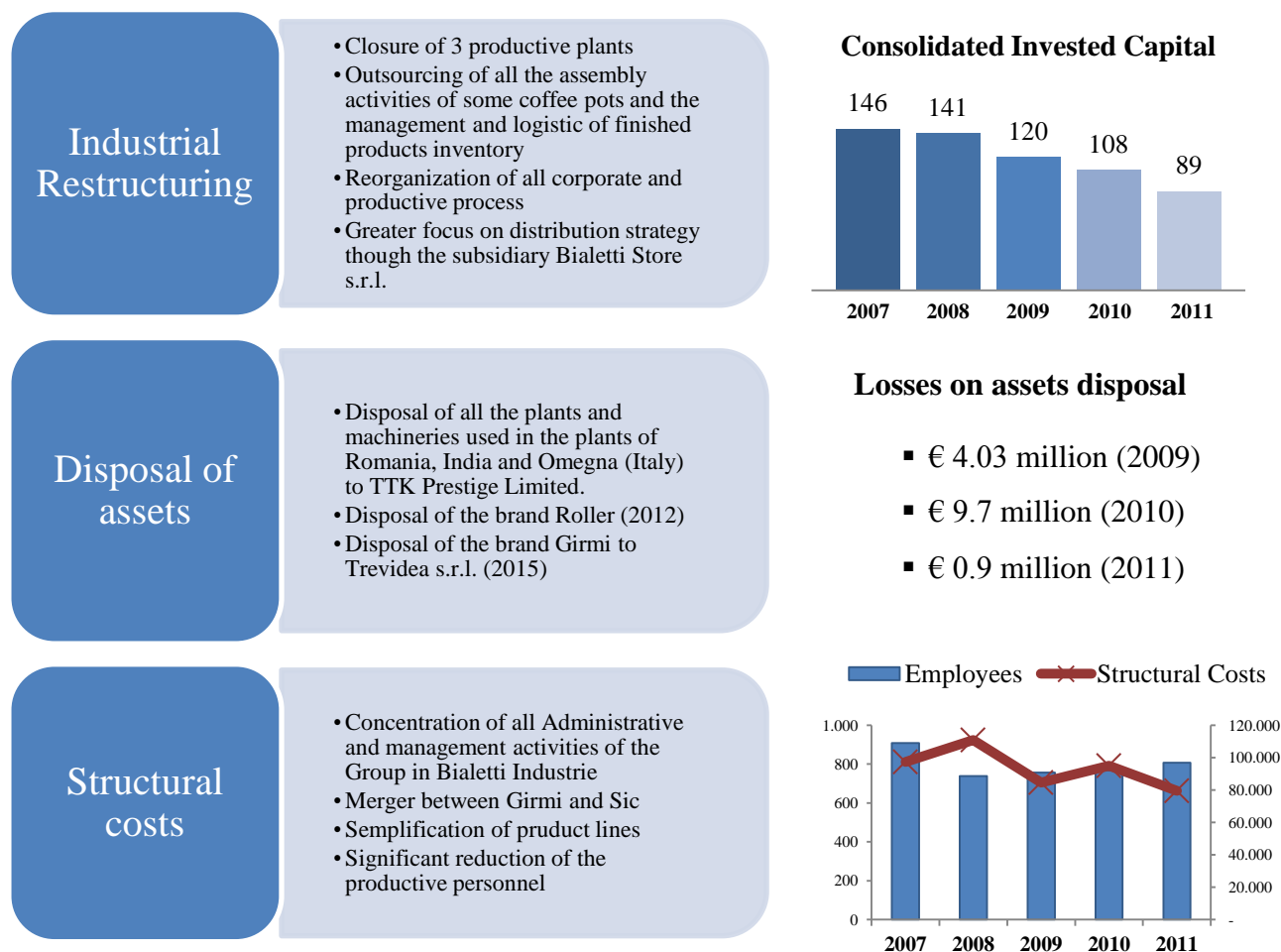
Store) creating in Bialetti Industrie a unique management and organizational structure for all brands of the Group and, at the same time, achieving significant administrative costs saving. During April 2011 the Group presented to creditor banks the restructuring plan 2011-2015. This restructuring plan can be identified in Italian law as *certificate plan ex art. 67 terzo comma Legge Fallimentare* and represents one of the possible legal options in Italy during a corporate crisis. Certificate plan has two objectives: reduce debt position under an appropriate level sustainable by the firm and restore the firm's capacity to create value. This legal instrument can be employed in corporate crisis situations where the going concern perspectives is still present and achievable through an appropriate firm restructuring without the intervention of the Court.

Restructuring plan 2011-2015 can be synthesized in the following points:

1. Extension of the Standstill Agreement which is about to expire on 31st December 2011.
2. Suspension of principal amount payments of mortgages with maturity between 1st April 2011 and 31st March 2013.
3. New financing for € 3.9 million to pay the short-term contractual obligations. Girmi and Aeternum brands was used as collaterals for this operation.
4. The conversion of trade payables for an amount of € 1.1 million of Bialetti Holding towards Bialetti Industrie in a future commitment to increase capital of Bialetti Industrie.
5. The respect of two covenants: NFP/equity and NFP/EBITDA lower than 6 and 11.3, respectively.

The restructuring plan approved by the Board in April 2011 can be considered the end of the downsizing phase and the beginning of the following relaunch phase. Restructuring interventions carried out by the Group between 2008 and 2011 are synthesized in the figure 3.3.

Figure 3.3. - Restructuring interventions made by the Group between 2008-2011



### 3.3.2. Relaunch phase

Restructuring plan presented to banks in order to obtain credit lines confirmation in 2011 specified also the main operating interventions through which the management intended to relaunch its business. More precisely, Bialetti strategy was based on the following points:

1. *New Brand positioning.* Given the price competition in household market, top management decided to reposition the brand Bialetti in the premium segment to improve profitability and restore the normal going concern conditions. This was achieved by strengthening Bialetti's position in the coffee business (coffee capsules, electric machines and coffee pots) by exploiting the historical strength of the brand in Italy. This was possible by adopting a continuing focus on innovation and design for existing and new products.
2. *New distribution strategy.* Since 2008, Bialetti's management attempted to change distribution strategy by increasing the focus on branded shops instead of large-scale retail distribution. This objective was achieved through the creation, in 2008, of the subsidiary Bialetti Store s.r.l. owned at 100 per cent by Bialetti Industrie. Bialetti Store car-

ries out commercial activities for all the Group's products and it is responsible for opening new single-branded shops and stores inside shopping malls.

Through this distribution strategy, Bialetti's attempted to increase margins and the costumers' availability to pay in order to reduce price competition.

The new business model became successful in 2011 when Bialetti Store recorded for the first time a positive income result. From 2008 to 2013 Bialetti Store opened 59 shops in Italy, one in France and another one in Spain.

3. *Reorganization and simplification of product portfolio.* Another important objective of Industrial Plan 2011-2015 was the reorganization of product portfolio. This objective strategy comes from both the necessity to reduce net working capital and to eliminate some product lines that was no longer profitable because of the change of customers needs. Simplification of product portfolio allowed the Group to focus on core business activities and reduce management complexity. As a consequence, inventory, expressed in revenue days, reduced from 105 in 2008 to 80 days in 2013.

In 2011 the Group recorded an income loss of € 2.8 million, significantly lower than that recorded in 2010. Sales, instead, decreased reaching €173.9 million at the end of 2011. In the same year, management of the Group decided to devote productive plant in Coccaglio to the production of coffee business activities. Two years later, even the subsidiary Bialetti Stainstell (Romania) converted production from pots to coffee machines.

Despite the above mentioned interventions, the Group faced new difficulties in 2012 when sales from cookware segment fall dramatically (-25 per cent in a year), even if in the same year sales of coffee machines and capsules increased by 6.6 per cent.

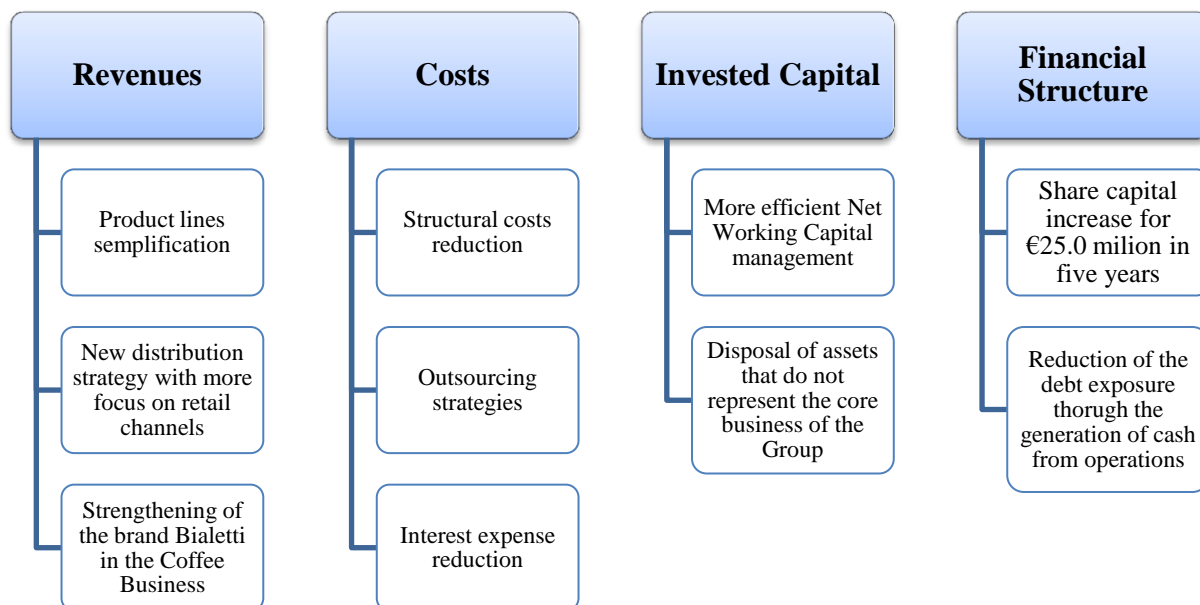
Negative results in 2012 created the necessity to renegotiate the terms of restructuring plan with banks because the Group was unable to respect covenants agreed in the certificate plan. For the occasion, Bialetti presented another Industrial Plan (2013-2017) which revised forecasts and objectives no longer achievable. In the same period Bialetti Holding approved another capital increase of € 15.0 million achievable in 5 years to cover losses occurred in preceding years. At the end of 2012 Bialetti Holding provided € 9.08 million cash to increase equity of Bialetti Industrie.

On 6th June 2013, the Group communicated to the market that another standstill agreement was reached with creditor banks. This agreement, called *Wiever*, confirmed short-term credit lines to the Group in exchange of the shareholders' commitment to increase equity capital of the holding company for an amount of € 25.0 million in the next 5 years.

Biennium 2012-2013 represents the re-launch phase of the Group during which investments required to change the business model were realized.

The relaunch involves three areas of interventions (revenues, costs, invested capital and capital structure) and they can be synthesized by the following figure.

Figure 3.4.: The main relaunch interventions



### 3.3.3. Development phase

At the end of 2013 the Group recorded a positive net income for € 4.1 million with an EBITDA margin that grew more than 2 per cent comparing with the previous year. Moreover, in the first months of 2014 the Group concluded an important commercial agreement with an American distributor.

After several months of negotiations, on 29th December 2014, creditor banks and the Board of Bialetti Industrie S.p.A signed the new certificate plan 2014-2017 with the following contents:

1. Increasing focus on the Bialetti brand, the main driver of growth for the Group
2. Development of retail channel with the opening of new single-branded shops in Italy and abroad
3. Confirmation of short and long term credit lines with the suspension of principal amount payments of mortgages until the end of the agreement
4. New financial covenants: NFP/equity lower than 30.0 and NFP/EBITDA lower than 6.2
5. Capital increase of € 25.0 million in the next five years

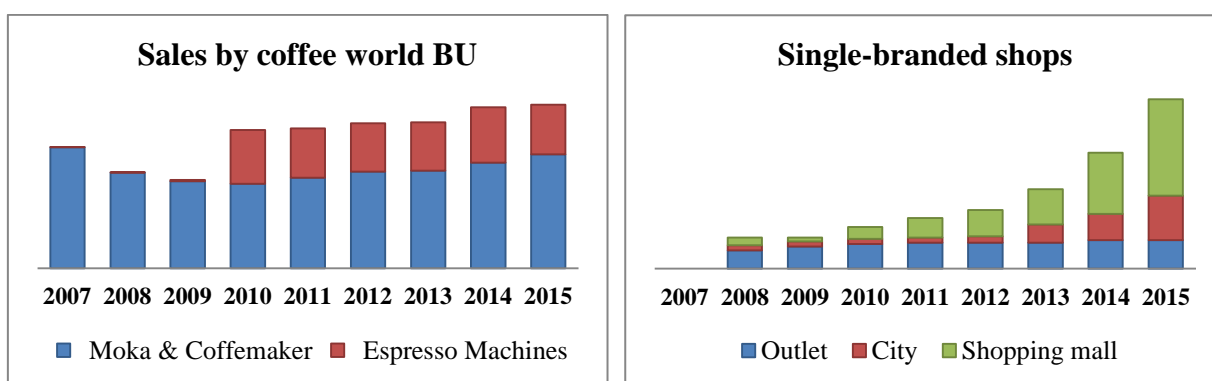


During 2014 Bialetti Store opened 28 new shops which contributed for a revenue growth of about 38.5 per cent on a yearly basis. Net income realized by Bialetti Store during the same year was € 0.6 million after an income loss of € 0.3 million in 2013. These results represented the turning point for Bialetti Group that decided to change business model from traditional production activities to an increasing focus on retailing activities.

Marketing campaigns devoted to strengthen Bialetti brand in the coffee business gave the first results in 2014 when revenues from *coffee world* business unit grew from € 75.8 million to € 83.6 million (+ 10.3 per cent in a year).

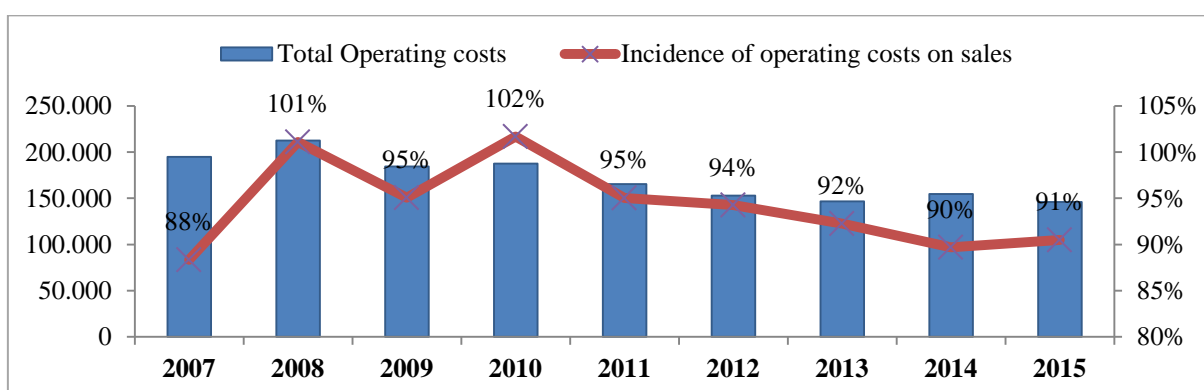
The following charts summarize the evolution of shops opened by the Group and revenues from Coffee World business unit in the period 2007-2015.

Figure 3.5. The main drivers of Bialetti's growth



At the end of 2014 the Group realized a positive net income of € 4.1 million. The last time the Group realized a positive income of more than € 1.0 million was in 2007. This confirmed the success of restructuring plan and the new business strategy. EBITDA margin increased by 3.3 per cent with respect to 2013 thanks to restructuring process which permits to reduce operating costs from € 154 million in 2013 to € 145 million in 2014. The evolution of operating costs and their incidence on sales from 2007 to 2015 can be illustrated by the figure 3.6.

Figure 3.6. - Evolution of operating costs and their incidence on sales



In January 2015 the Board of Directors of Bialetti Industrie S.p.A. approved the capital increase for an amount of € 14.5 million in compliance with the certificate plan agreed the previous year.

In a view of simplification and reorganization, at the end of 2015 Bialetti signed a preliminary agreement for the sale of the Girmi brand to Trevidea s.r.l. for an amount of € 4.5 million. This agreement however was subject to the bank's consent who could benefit from right of pledge on this brand for the financing granted to Bialetti in 2011.

The positive results of the Group in 2014 were confirmed in 2015. EBITDA margin remained stable at 10 per cent and net financial position improved by € 2.5 million.

In 2015, revenues grew by 6.9% at consolidated level thanks to the very positive performance of Bialetti Store s.r.l. which was able to increase sales by 44% in a year and to realize a net income of € 2.7 million against € 0.6 million in 2014. At the end of the year, single-brand shops opened in Italy, France and Spain by Bialetti Store were 130.

It is also important to remark that all the financial covenants specified in the certificate plan were met at the end of 2015. This represent a very important condition to maintain the necessary liquidity to run the business.

In first six months of 2016 the Group realized a performance in line with expectations. However, even if these positive results should be taken into account, it is important not to underestimate the uncertainty that the firm is still facing during the valuation process. For this reason in the following paragraph a detailed economic and financial analysis is carried out focusing on the main value drivers which can affect Bialetti's intrinsic valuation.

#### *3.4. Economic and financial analysis*

In this paragraph financial amounts and ratios that better represent past performance of Bialetti Group will be analyzed. The time horizon considered in our analysis is the last decade. This permits to have a clear understanding of the corporate evolution before and after the crisis. Moreover, in the appendix of the present chapter we have extensively reported Balance Sheet, Income Statement and Cash Flow statement of the Group appropriately reorganized for valuation purposes. In appendix are also reported the approach used to compute the rating class of the Group and the most significant financial ratios.

In order to better identify factors responsible of the Group's financial and economic crisis, the analysis has been enriched by the comparison with a benchmark competitor: De Longhi Group. The Group's unique traits make it difficult to identify fully comparable companies.

However, De Longhi represents Bialetti's most similar comparable company, since they have similar positioning in the household and coffee business.

Before entering in detail of economic and financial data, it is useful to see at Bialetti's stock price evolution because it represents a proxy of the value created by the firm overtime.

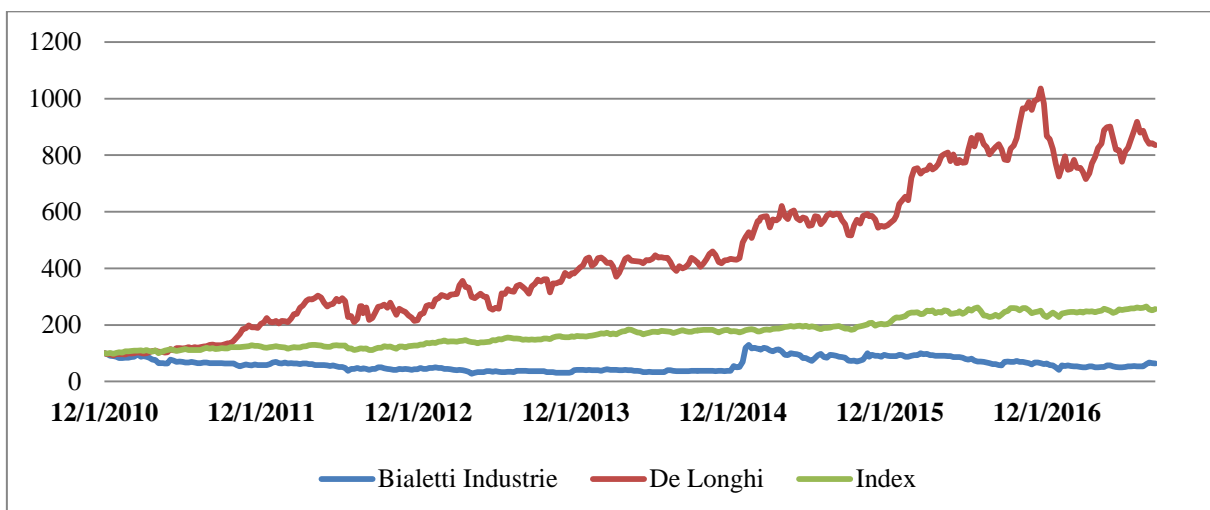
Figure 3.7. - Bialetti Industrie S.p.A. stock price evolution (source: Yahoo Finance)



As we can see from the graph, the evolution of market price is particularly negative since Bialetti's quotation in July 2007. Most of the value was lost in biennium 2008-2009 when the firm started to suffer the global financial crisis and a greater competition of foreign competitors.

If we compare the Bialetti's stock price evolution in the last 6 years with that of De Longhi and EURO STOXX 600 Household Goods Index we can obtain a chart like the following one.

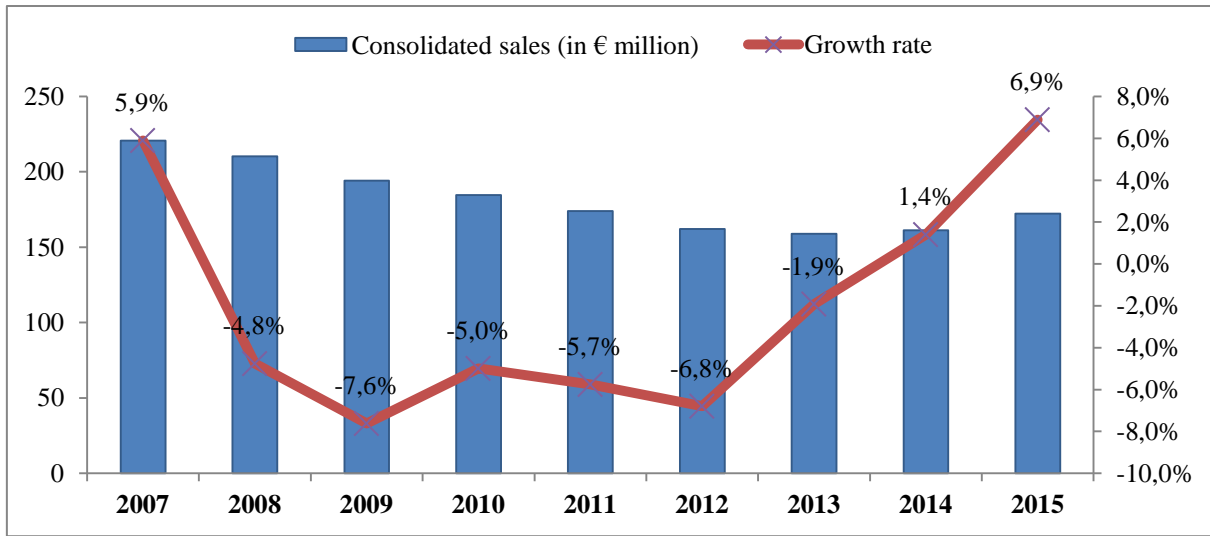
Figure 3.8. - Market prices evolution in the period 2010-2016 expressed on 100 basis points (source: Yahoo Finance)



As we can see, if we standardize the stock price of the three securities at 1st January 2010, we can see very well that the performance of Bialetti has been very poor compared with De Longhi and even with the rest of household industry. This is a very important signal that suggests Bialetti's corporate crisis is more internal than external.

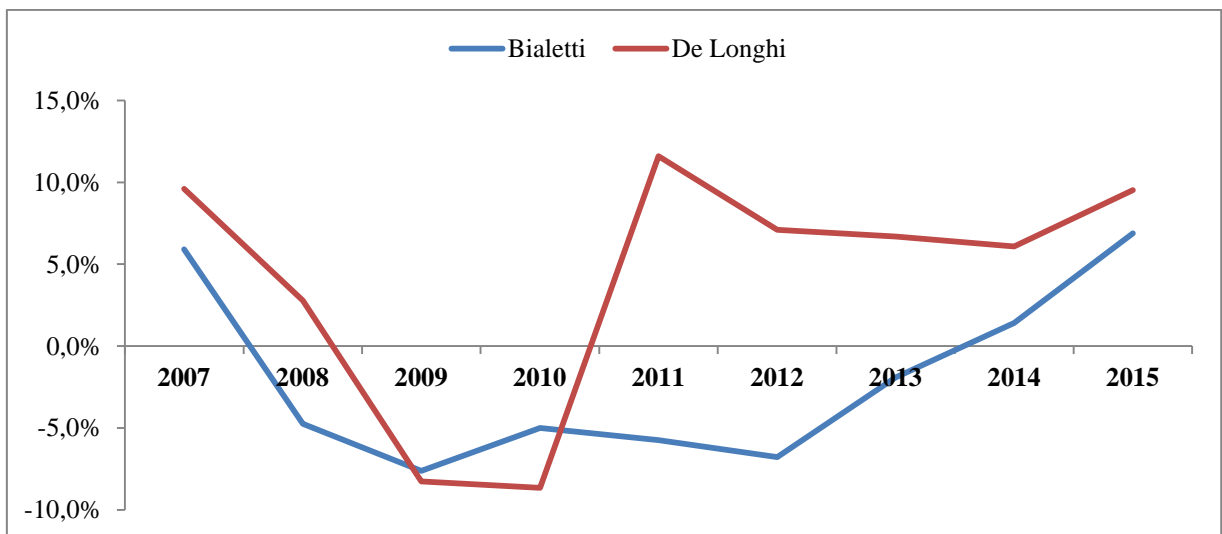
We can start considering the evolution of sales during the time period of our analysis.

Figure 3.9. - Consolidated sales 2007-2015



Sales CAGR in the period 2007-2015 is -2.1 per cent. The first fall in revenues was recorded in 2008 with an annual decrease of 4.8%. Overall, consolidated sales decreased from € 220.7 million in 2007 to € 172.4 million in 2015.

Figure 3.10. - Sales growth rates comparison



When we compare Bialetti's sales growth rates with those of competitors (De Longhi) the trend appears much more clear. As we can see from figure 4.10., during years 2008, 2009 and 2010 global financial crisis hit the consumption level and customers' willingness to pay because both firms recorded decreasing and negative sales growth rates. However, after 2010, the path is different for the two companies: Bialetti was unable to recover sales as De Longhi did. This is probably due to the fact that the great part of Bialetti's sales are realized in Italy, where the financial crisis was particularly deep. De Longhi, instead, realizes a greater part of turnover abroad, where the economic conditions improved first than Italy.

Figure 3.11. - EBITDA and EBITDA margin 2007-2015

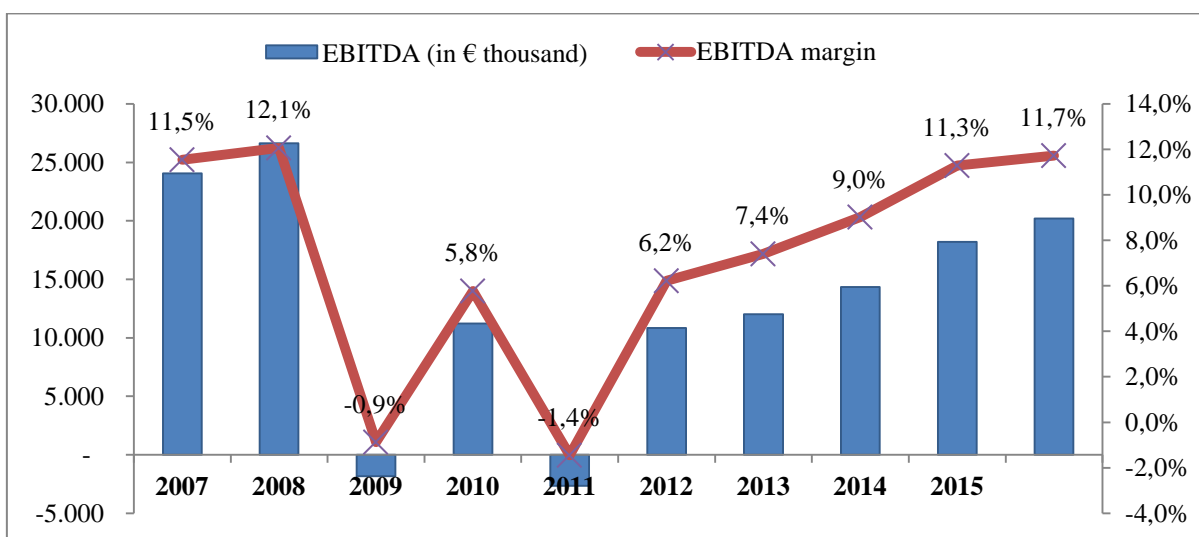
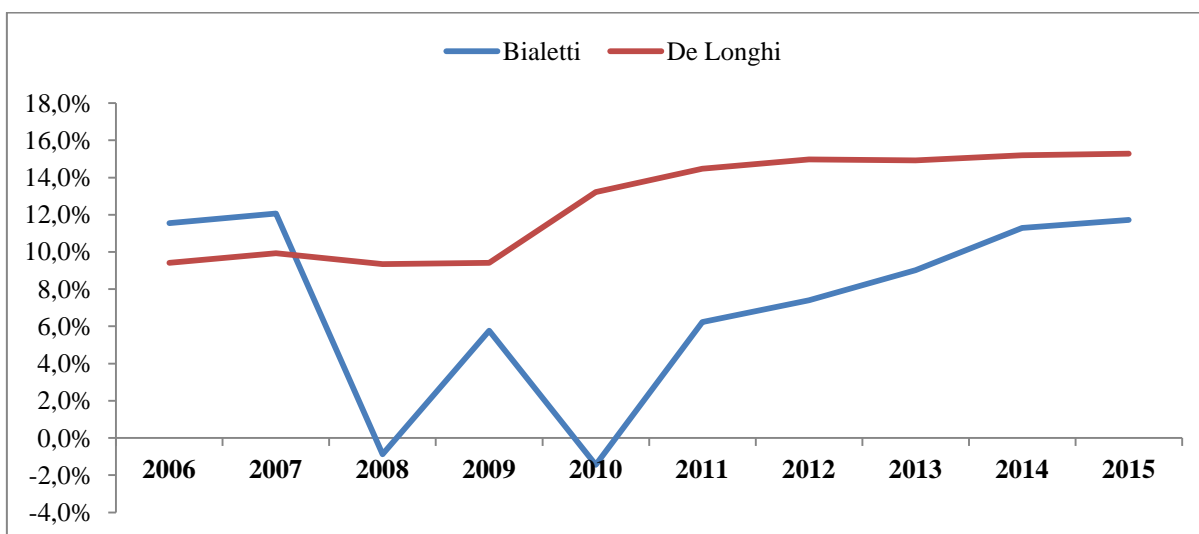


Figure 3.12. - EBITDA margin comparison



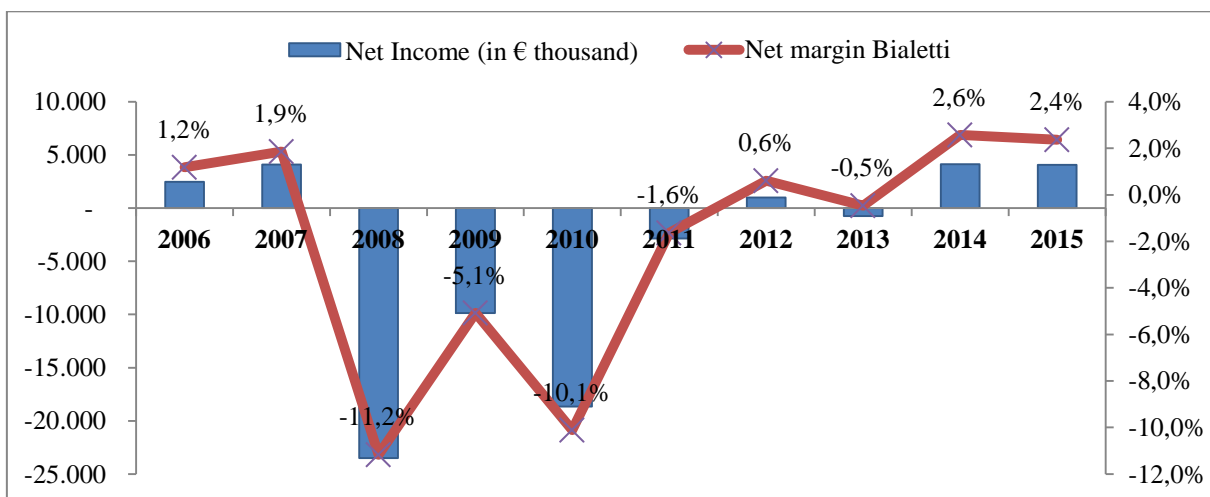
The reduction of operating costs achieved by the Group during the restructuring process had been less than proportional with respect to the sales fall. This resulted in a EBITDA deteriora-

tion which passed from € 26.6 million in 2007 to € 20.2 million in 2015 as illustrate in the following figure.

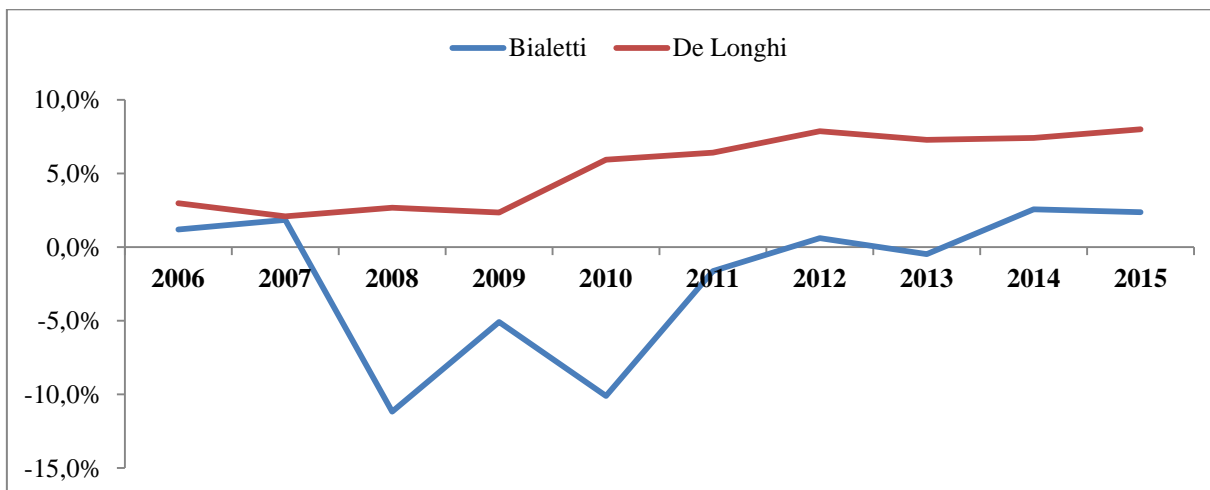
The most significant EBITDA decrease occurred in 2008. In that year EBITDA was negative for about € 1.8 million. The main cause of poor margins are attributable the decrease of sales volume, increasing weight of distribution channels with low margins and greater incidence of fixed costs relating with the opening of new branded shops. After an initial recovery in 2009, EBITDA margin remained negative even in 2010. It returned into positive territory only in 2011 and then it started to increase year by year. Different was the evolution of De Longhi EBITDA margin which remained quite stable during years of the crisis and then started to increase progressively. This demonstrates a greater ability of De Longhi Group to reduce structural costs and get a more flexible cost structure during years of the crisis.

The same path is visible by looking at the evolution of net income in the years 2006-2015.

### 3.13. - Net income 2006-2015



### 3.14. - Net margin comparison



From 2008 to 2013, Bialetti's net margin remained substantially negative while De Longhi showed a positive and increasing trend which ended with a net margin of 8 per cent in 2015. To worsen Bialetti's poor performance contributed also interest expense, that in the period 2005-2008 went from € 4.1 million to € 12.1 million. After that, standstill agreement concluded with creditor banks in 2009 allowed the company to maintain an interest expense of about € 5-6 million from 2009 to 2015 with an average cost of debt of about 5.5 per cent. Bialetti's total invested capital started to decrease in 2008. The decreasing trend continued until 2012 when the restructuring process finished and the relaunch phase started.

Figure 3.15. Invested Capital (including goodwill and similar intangibles) 2006-2015

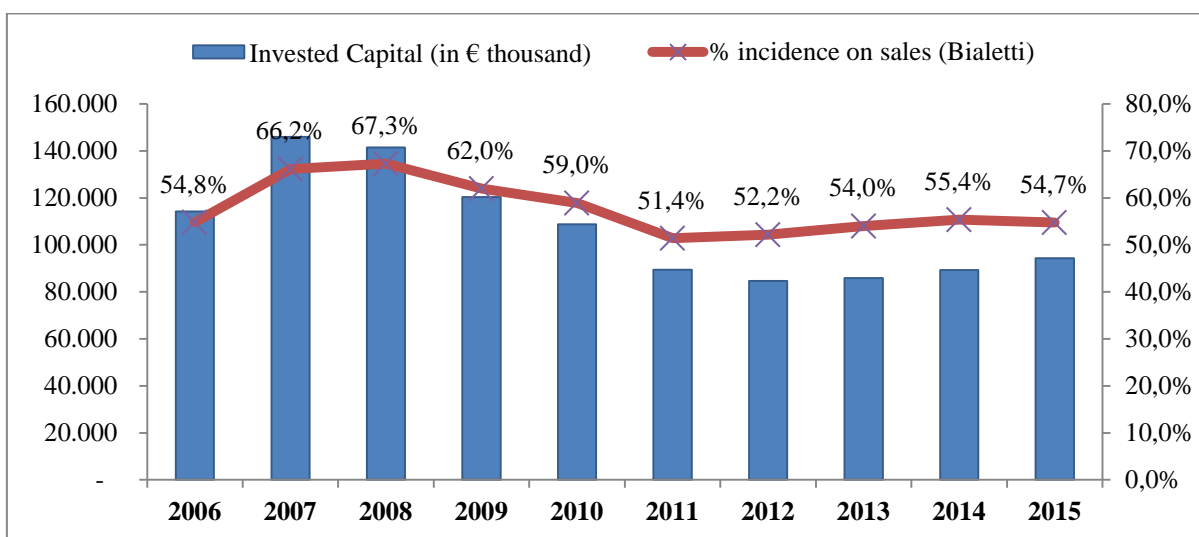
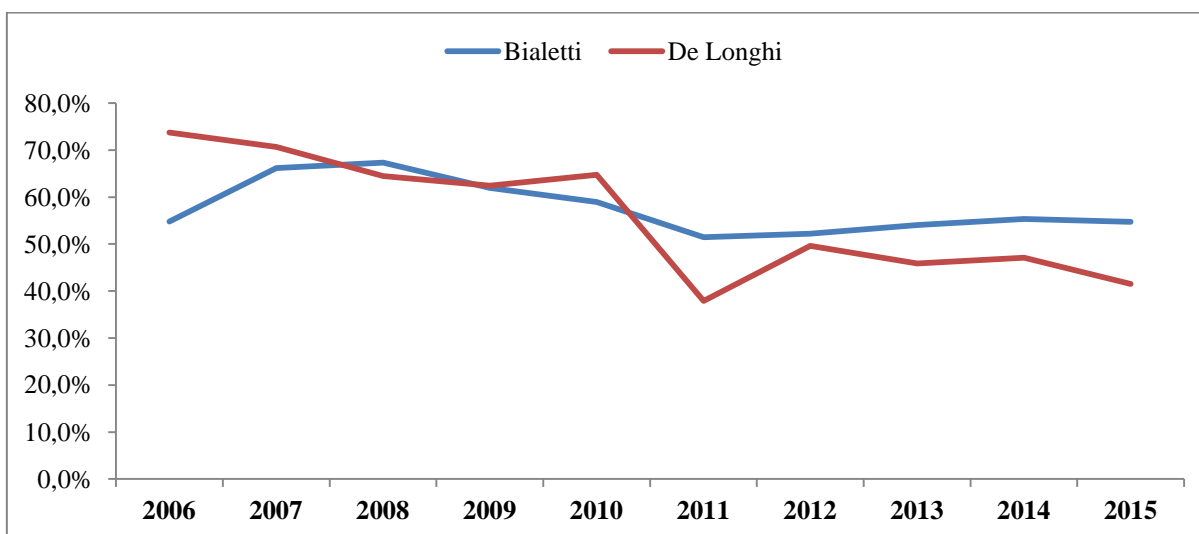


Figure 3.16. - Invested Capital on sales comparison



The ratio Invested Capital over sales is a useful indicator of the firm's flexibility. In 2008 this ratio was equal to 63.7%. After the restructuring process performed between 2008 and 2011

the ratio settled at about 55%. De Longhi, instead, is much more flexible because its ratio is about 41.5% in 2015.

Structural rigidity makes it difficult and slow capital adjustments after sales fluctuations. For this reason, Bialetti Group needed structural changes to recover from the crisis.

If we move our attention to net working capital evolution, we see that it progressively reduced from € 66.2 million in 2006 to € 55.3 million in 2015. The decrease on net working capital is mainly due to sales slowdown and reduction of other operating assets and liabilities, which include tax receivables, tax payables, accruals, deferrals and other operating receivables.

Figure 3.17. - Net working capital 2006-2015

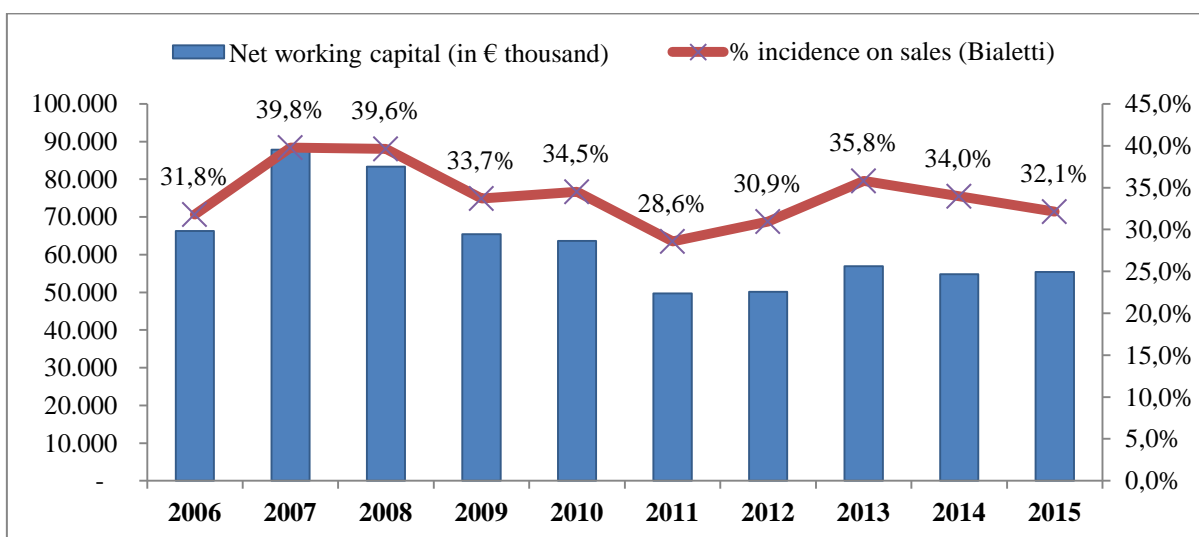
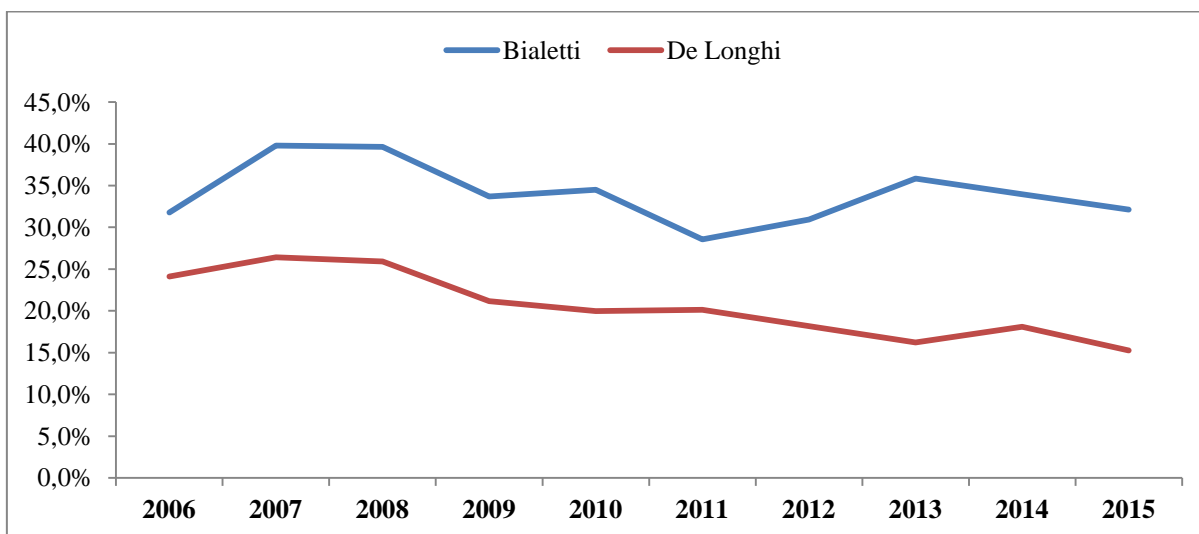


Figure 3.18. - Net working capital comparison

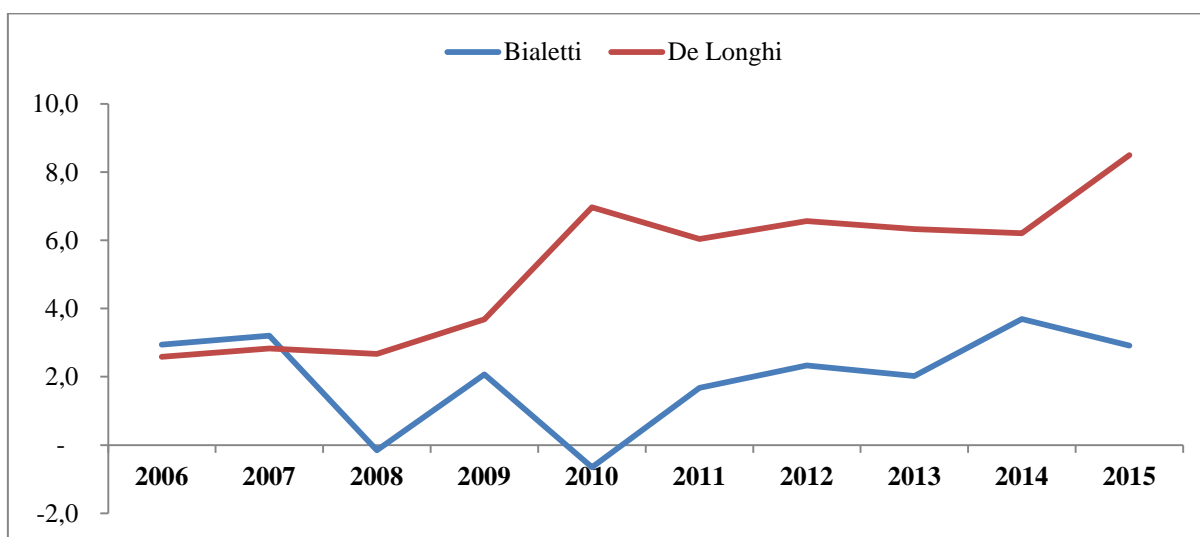


Ratio analysis highlights an extension of commercial cycle with an increase of both trade receivables days, from 128 in 2006 to 142 in 2015, and the inventory days, from 83 days in



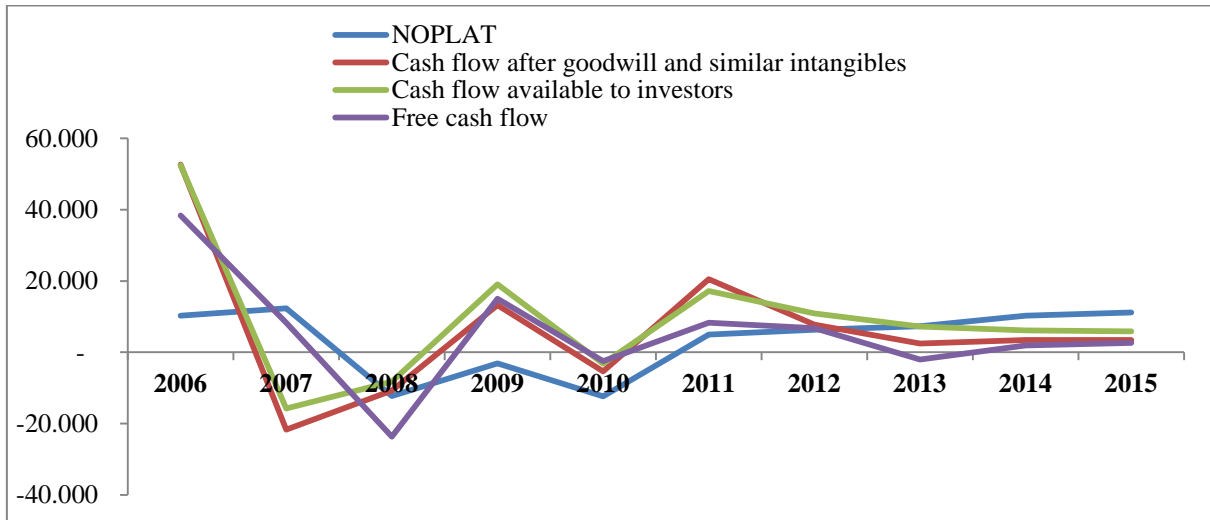
2006 to 86 days in 2015. By contrast, the increase of trade payables was much more steady. This is an evident symptom of loss of bargaining power that firm suffered during corporate crisis. Rationalization and simplification interventions combined with a careful working capital management should help the company to find the right equilibrium on commercial cycle. EBITDA on interest expense is one of the most important ratios used to evaluate the company's ability to pay interest expense and generate profits. The evolution of this ratio for firms under analysis is reported in the following figure.

Figure 3.19. - EBITDA/Interest expense comparison



When this ratio becomes lower than 1, it means that the firm is forced to obtain new financing to pay interest expense. Figure 4.19 shows that, before global crisis, the situation was very similar for both companies with an EBITDA/interest expense ratio of about 2.7. However, in the following years, the situation evolved differently because De Longhi was able to improve its EBITDA overtime while Bialetti encountered greater difficulties to pay interest expenses. Bialetti's situation improved only after 2011 when the ratio became always higher than 2. In order to have an overall picture of the firm's capacity to generate cash flows, in the following graph are reported the main Cash Flow Statement intermediate results from 2006 to 2015.

Figure 3.20. - Cash Flow Statement results 2006-2015



The following charts, instead, illustrates Bialetti Group's capital structure evolution in the last decade.

Figure 3.21. - Capital structure evolution 2006-2015

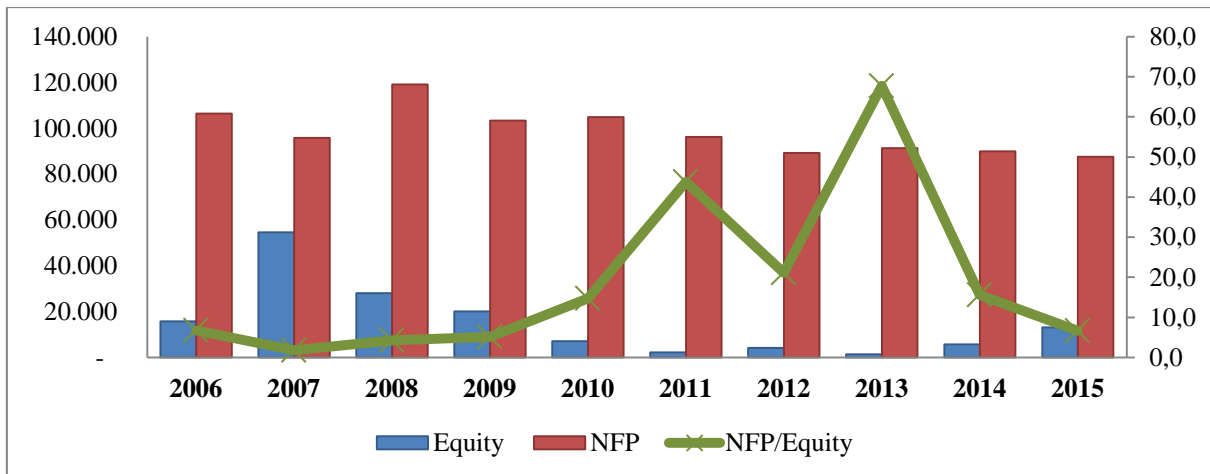
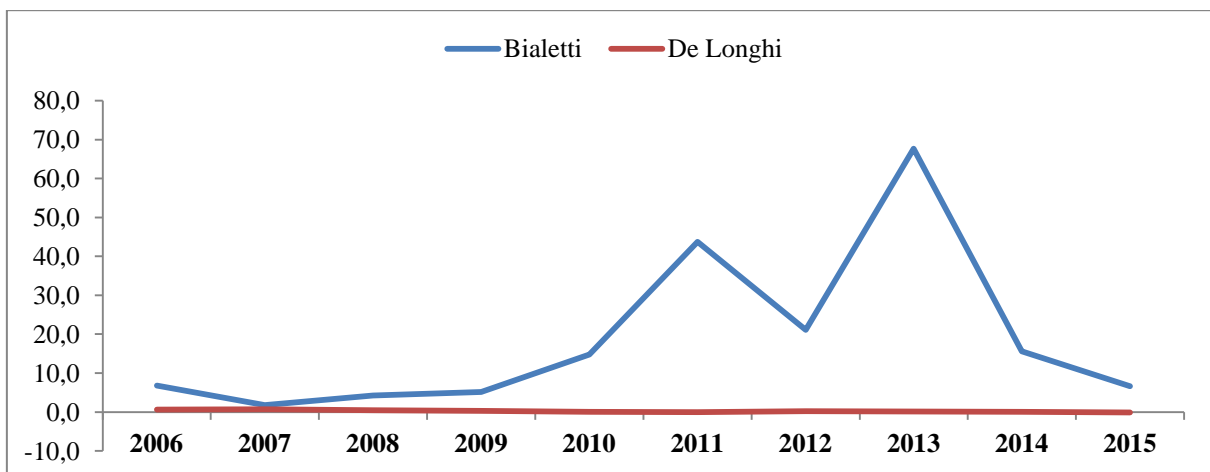


Figure 3.22. - NFP/equity comparison



Bialetti's capital structure changed considerably during the period under analysis. In particular, from 2008, the worsening economic conditions and the beginning of restructuring interventions lead to progressive erosion of equity and a corresponding increase of NFP/equity ratio. Net financial position reached its peak in 2008 with an amount of € 119 million. After that, the standstill agreement and the restructuring interventions helped the company to stabilize NFP at about € 90 million in the period 2011-2015. NFP reduction occurred between 2009 and 2011 is due to the disposal of non-operating and the marginality improvement which increased the Group's ability to generate cash.

NFP/EBITDA is a very useful indicator which can be adopted to assess the company ability to meet debt obligations.

Figure 3.23. - NFP/EBITDA comparison

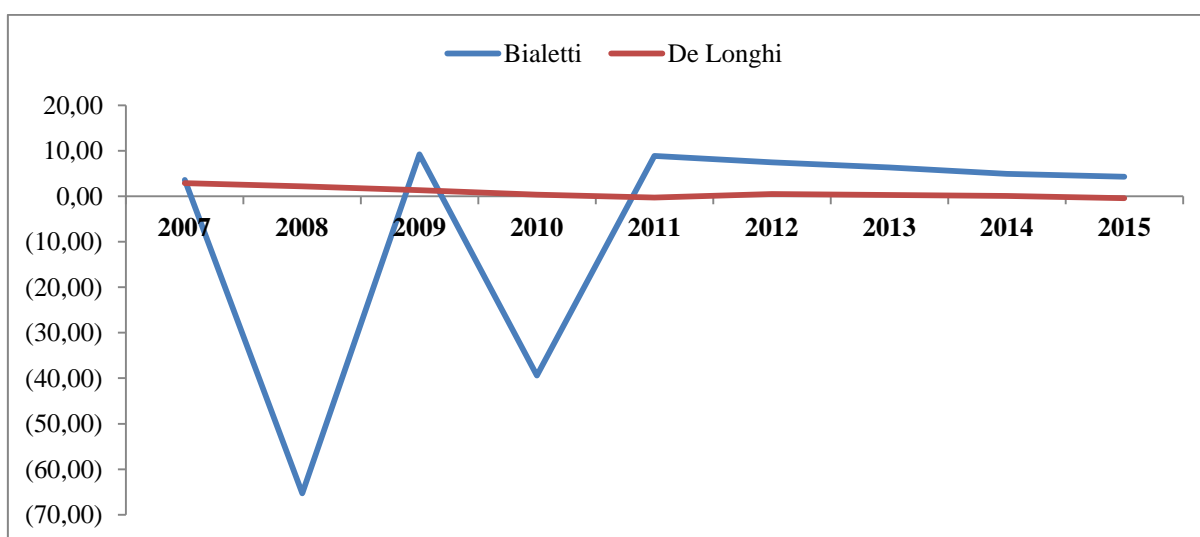


Figure 4.23 shows that Bialetti's NFP/EBITDA is always higher than De Longhi, indicating a greater difficulty to meet debt payments. The negative ratio in 2008 and 2010 is caused by a negative EBITDA recorded by Bialetti Group in those years.

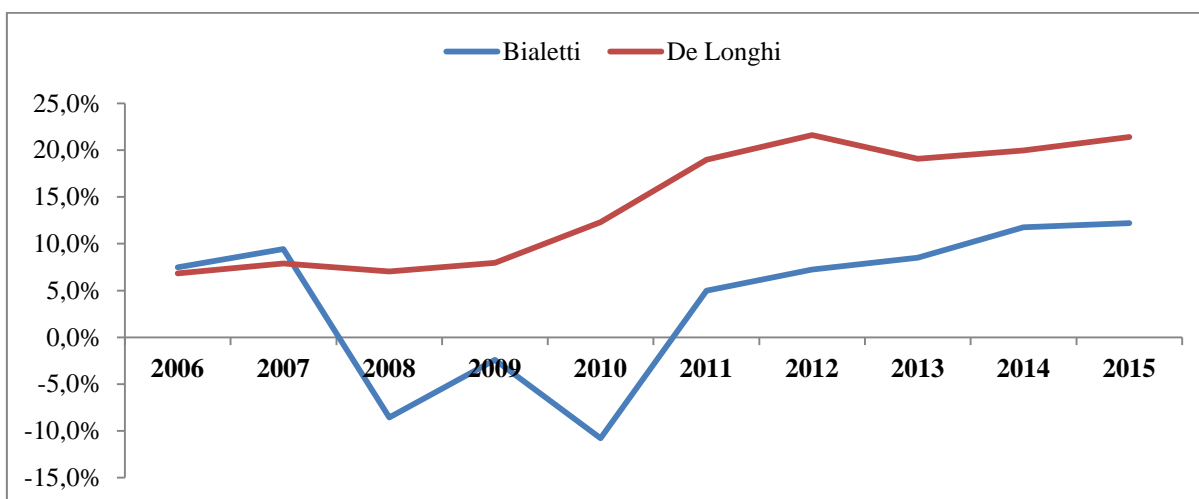
NFP/EBITDA is one of the ratios that can be used to give an overall rating class to the Group. The other two ratios we used in our rating analysis are EBITA/interest expense and free cash flow/NFP. A detailed rating analysis of the Group is reported in appendix 4.8, from which we can reasonably conclude that the Group belongs to *B* rating class at the end of 2015.

To conclude our analysis, we consider the main profitability ratios of the two companies.

*ROIC (Return On Invested Capital)* is an indicator of the firm's operating performance and its ability to create value. As we can see from figure 4.24 both companies suffered a loss of operating performance in 2008 because of deterioration of industry conditions. However, the effect is much more visible in Bialetti rather than in De Longhi. The following years De Longhi

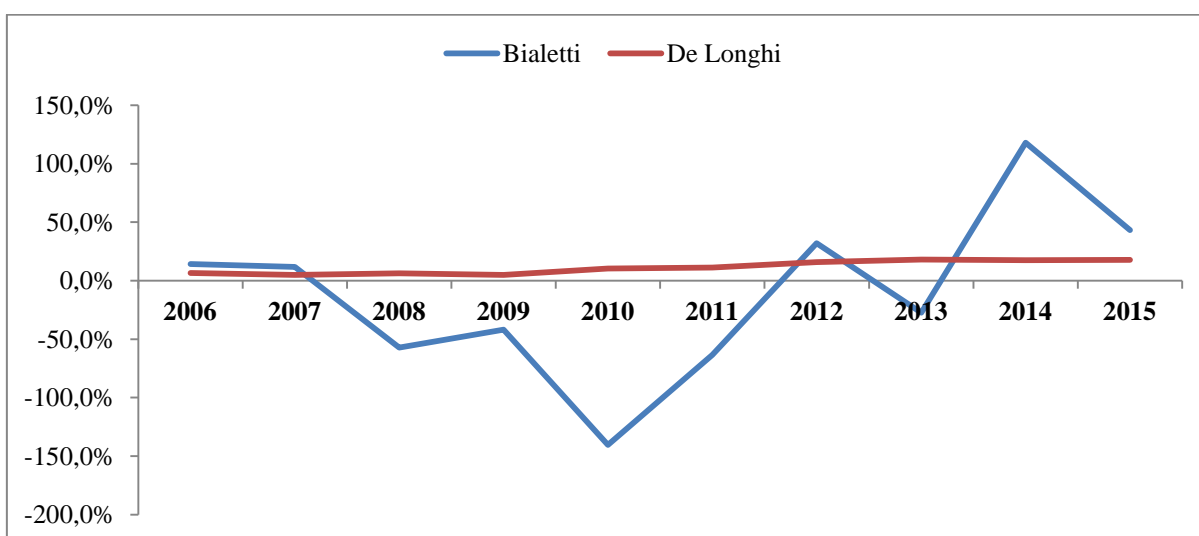
was able to recover its operating performance very quickly. Bialetti, instead, suffered a deep restructuring process which maintained its operating performance negative until 2010. Only in the following years the effects of restructuring process and certificate plan permit to improve operating performance year by year.

Figure 3.24. - ROIC comparison



The overall performance of the Group was positive in 2006 (ROE equal to 14.2%) and 2007 (ROE equal to 11.7%) but it decreased dramatically in the following year and remained negative until 2011.

Figure 3.25. - ROE comparison



A loss of performance in 2007 is visible also for De Longhi, when ROE decreased to 4.9% from 6.5% in 2006. However, in the following years, De Longhi profitability increased pro-

gressively until arriving at 17.7% in 2015. Instead, Bialelli's ROE returned to a positive territory only in 2012.

In 2014 and 2015 Bialelli's ROE is respectively 118% and 43%. These values are greatly influenced by equity erosion occurred between 2008 and 2011. The capital increase expected in 2016 will bring again the ratio to more realistic values.

### *3.6. Risks and uncertainties*

The Group operates in a global industry which is historically cyclical because it depends on the global tendency of economy. In recent years, Bialelli heavily suffered the economic slowdown which led to decreasing demand and strong reduction of consumption level. Furthermore, the market in which the Group operates is highly competitive. Indeed, the success of Bialelli Group in the next years will depend on its ability to maintain and increase market share in Italy and expand into international market. Macroeconomic variables which can significantly affect economic and financial situation of the Group are: national GDP evolution, consumer and business confidence evolution, interest rates evolution, raw materials costs and unemployment rate in those countries where the Group operates.

Furthermore, we should not forget that the Group is going to a critical corporate restructuring and the failure to meet targets specified in the strategic plan 2014-2017 could jeopardize business continuity. The main uncertainties and risks which can compromise the Group's business continuity in the next years can be listed as follows:

1. The respect of clauses specified in the certificate plan of December 2014. Among these clauses the most important are the realization of the capital increase in compliance with the terms and conditions agreed with banks as well as the respect of financial covenants.
2. The results of interventions specified in the certificate plan 2014-2017 and the achievement of planned objectives. In fact, general conditions of the economy could change the assumptions underlying the strategic plan and determining significant gaps between actual economic and financial indicators and those expected.
3. Risks linked to exchange rates and interest rates fluctuations due to the geographic distribution of the Group's activities. In particular the Group is particularly exposed, from exports side, to fluctuations of US dollar and GB pound against euro, while from imports side, it is exposed to fluctuations of Turkish lira, Brazilian real and Chinese Yuan against Euro. The effect of sudden exchange rates fluctuations could have signifi-

cant negative effects on the income results since at the end of 2015 the Group has no specific derivative instruments to hedge exchange rate risk.

4. Risks linked to the relationships with employees and suppliers, regulated by several laws and collective labor agreements, which could influence the flexibility of the Group. Trade union protests caused by personnel reduction or other cost control measures can produce negative effects for corporate business. Moreover, strict relationships with suppliers and firms external to the Group can create problems connected with operations continuity of these suppliers.
5. Risks related to the fluctuations of raw materials purchase prices. Bialetti purchases raw materials and semi-finished goods through a centralized procurement system. This allows the Group to ensure cost targets are met. Purchases are managed through contractual plans to exploit favorable market conditions, especially for aluminum. Costs of raw materials and consumables have the highest incidence on Bialetti's Income Statement. In the period 2005-2015, raw materials costs weighed between 40 and 45 per cent on net revenues. So, a sudden fluctuation in raw materials purchase prices could significantly affect the economic results of the Group considering that on 31st December 2015 there is no specific derivative contract to hedge the purchase price risk for aluminum or other metals.
6. Risks connected with management of the Group, on which depends the realization of strategic plan. In fact, Bialetti's operating and financial condition may create difficulties to attract and retain qualified human resources compromising the Group's future perspectives.
7. Risks relating international markets conditions. Bialetti is exposed to economic and political conditions of countries in which it operates, the realization of imports/exports restrictive policies and different fiscal regimes.
8. Risks connected with environmental policies.
9. Risks connected with economic results of subsidiaries and associates.
10. Risks connected with the capacity to offer innovative and competitive products in terms of price and quality.

All these risks and uncertainties create difficulties to provide an accurate picture of the scenario the Group can face in the next future. However, in the next chapter appropriate valuation methods are applied to take into account volatile conditions and future uncertainties of Bialetti Group.

Appendix 3.1. - Reorganized Balance Sheet (Invested Capital)

|  | 2015           | 2014           | 2013           | 2012            | 2011            | 2010           | 2009           | 2008           | 2007           | 2006           | 2005           |
|--|----------------|----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Reorganized Balance-Sheet (Invested Capital)</b>                |                |                |                |                 |                 |                |                |                |                |                |                |
| Working cash*  | 1.724          | 1.612          | 1.590          | 1.621           | 1.739           | 1.845          | 1.942          | 2.102          | 2.207          | 2.084          | 1.890          |
| Trade receivables  | 60.401         | 67.472         | 60.024         | 62.147          | 56.651          | 69.807         | 67.109         | 72.009         | 81.984         | 73.319         | 73.758         |
| Inventories  | 39.151         | 34.337         | 35.088         | 34.883          | 45.483          | 52.548         | 41.406         | 60.604         | 56.227         | 43.281         | 44.727         |
| Trade payables   | (40.127)       | (44.859)       | (34.164)       | (36.191)        | (40.442)        | (53.225)       | (44.445)       | (50.308)       | (55.204)       | (44.589)       | (45.232)       |
| <b>Trade working capital</b>                                       | <b>61.149</b>  | <b>58.562</b>  | <b>62.538</b>  | <b>62.460</b>   | <b>63.431</b>   | <b>70.975</b>  | <b>66.012</b>  | <b>84.407</b>  | <b>85.214</b>  | <b>74.095</b>  | <b>75.143</b>  |
| Other operating current assets                                     | 8.744          | 9.248          | 6.368          | 5.058           | 6.750           | 5.188          | 8.865          | 12.469         | 12.455         | 5.690          | 6.988          |
| Other operating current liabilities                                | (14.496)       | (13.016)       | (11.936)       | (17.362)        | (20.474)        | (12.505)       | (9.420)        | (13.547)       | (9.827)        | (13.524)       | (9.077)        |
| <b>Other current assets and liabilities</b>                        | <b>(5.752)</b> | <b>(3.768)</b> | <b>(5.568)</b> | <b>(12.304)</b> | <b>(13.724)</b> | <b>(7.317)</b> | <b>(555)</b>   | <b>(1.078)</b> | <b>2.628</b>   | <b>(7.834)</b> | <b>(2.089)</b> |
| <b>Net working capital</b>   | <b>55.397</b>  | <b>54.794</b>  | <b>56.970</b>  | <b>50.156</b>   | <b>49.707</b>   | <b>63.658</b>  | <b>65.457</b>  | <b>83.329</b>  | <b>87.842</b>  | <b>66.261</b>  | <b>73.054</b>  |
| Tangible assets  | 21.978         | 21.725         | 20.602         | 21.868          | 19.360          | 25.682         | 29.748         | 35.519         | 28.214         | 27.153         | 66.494         |
| Operating intangibles  | 5.485          | 2.982          | 2.350          | 2.505           | 2.612           | 3.953          | 5.975          | 8.300          | 10.701         | 5.437          | 4.509          |
| <b>Total operating fixed capital</b>                               | <b>27.463</b>  | <b>24.707</b>  | <b>22.952</b>  | <b>24.373</b>   | <b>21.972</b>   | <b>29.635</b>  | <b>35.723</b>  | <b>43.819</b>  | <b>38.915</b>  | <b>32.590</b>  | <b>71.003</b>  |
| Operating receivables and other non-current assets                 | 3.755          | 2.985          | 2.598          | 1.983           | 2.704           | 2.776          | 4.259          | 203            | 259            | 2.706          | 11.733         |
| Operating deferred-tax assets/(liabilities)                        | 4.157          | 3.590          | 3.054          | 2.258           | 2.574           | 1.708          | 1.323          | 347            | 2.579          | (297)          | (7.815)        |
| Operating non-current liabilities                                  | (7.596)        | (8.581)        | (11.652)       | (7.161)         | (660)           | (770)          | (1.597)        | (2.349)        | (2.888)        | (7.142)        | (8.273)        |
| Operating provisions   | (186)          | (191)          | (167)          | (160)           | (343)           | (3.719)        | (593)          | (710)          | (407)          | (362)          | (265)          |
| <b>Total other non-current operating assets and liabilities</b>    | <b>130</b>     | <b>(2.197)</b> | <b>(6.167)</b> | <b>(3.080)</b>  | <b>4.275</b>    | <b>(5)</b>     | <b>3.392</b>   | <b>(2.509)</b> | <b>(457)</b>   | <b>(5.095)</b> | <b>(4.620)</b> |
| <b>Invested capital excluding goodwill and similar intangibles</b> | <b>82.990</b>  | <b>77.304</b>  | <b>73.755</b>  | <b>71.449</b>   | <b>75.954</b>   | <b>93.288</b>  | <b>104.572</b> | <b>124.639</b> | <b>126.300</b> | <b>93.756</b>  | <b>139.437</b> |
| Goodwill and similar intangibles                                   | 10.960         | 11.431         | 11.679         | 12.750          | 13.243          | 15.320         | 15.623         | 16.787         | 19.675         | 20.482         | 19.324         |
| Deferred tax asset/(liabilities) on similar intangibles            | 404            | 539            | 494            | 422             | 299             | 164            | 127            | 94             | 47             | 16             | 33             |
| <b>Goodwill and other similar intangibles</b>                      | <b>11.364</b>  | <b>11.970</b>  | <b>12.173</b>  | <b>13.172</b>   | <b>13.542</b>   | <b>15.484</b>  | <b>15.750</b>  | <b>16.881</b>  | <b>19.722</b>  | <b>20.498</b>  | <b>19.357</b>  |
| <b>Invested capital including goodwill and similar intangibles</b> | <b>94.354</b>  | <b>89.274</b>  | <b>85.928</b>  | <b>84.621</b>   | <b>89.496</b>   | <b>108.772</b> | <b>120.322</b> | <b>141.520</b> | <b>146.022</b> | <b>114.254</b> | <b>158.794</b> |
| Non-operating current assets                                       | 1.291          | 1.461          | 0              | 395             | 907             | 0              | 300            | 0              | 52             | 400            | 536            |
| Non-operating deferred-tax assets/(liabilities)                    | 1.938          | 1.970          | 4.109          | 5.434           | 3.111           | 1.753          | 1.335          | 2.524          | 851            | 3.059          | 283            |
| Non-operating assets   | 3.120          | 2.930          | 2.633          | 3.097           | 4.871           | 1.425          | 1.424          | 3.137          | 3.505          | 4.531          | 4.396          |
| <b>Non-operating assets and liabilities</b>                        | <b>6.349</b>   | <b>6.361</b>   | <b>6.742</b>   | <b>8.926</b>    | <b>8.889</b>    | <b>3.178</b>   | <b>3.059</b>   | <b>5.661</b>   | <b>4.408</b>   | <b>7.990</b>   | <b>5.215</b>   |
| <b>TOTAL FUNDS INVESTED</b>  | <b>100.703</b> | <b>95.635</b>  | <b>92.670</b>  | <b>93.547</b>   | <b>98.385</b>   | <b>111.950</b> | <b>123.381</b> | <b>147.181</b> | <b>150.430</b> | <b>122.244</b> | <b>164.009</b> |

\*Working cash on revenues equal to 1%

Appendix 3.2. - Reorganized Balance Sheet (Source of financing)

|  | 2015           | 2014          | 2013          | 2012          | 2011          | 2010           | 2009           | 2008           | 2007           | 2006           | 2005           |
|--|----------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Reorganized Balance-Sheet (Source of Financing)</b> |                |               |               |               |               |                |                |                |                |                |                |
| Excess cash  | 6.896          | 8.001         | 2.453         | 6.334         | 1.243         | 1.311          | 1.148          | 1.281          | 4.603          | 2.781          | 2.247          |
| Long-term borrowings                                   | 79.194         | 79.615        | 91.027        | 92.509        | 93.954        | 102.117        | 85.091         | 100.514        | 74.577         | 82.078         | 101.160        |
| Short-term borrowings                                  | 12.107         | 15.389        | 306           | 697           | 880           | 1.076          | 15.499         | 15.230         | 20.854         | 19.849         | 38.570         |
| <b>Net financial position</b>                          | <b>84.405</b>  | <b>87.003</b> | <b>88.880</b> | <b>86.872</b> | <b>93.591</b> | <b>101.882</b> | <b>99.442</b>  | <b>114.463</b> | <b>90.828</b>  | <b>99.146</b>  | <b>137.483</b> |
| Provision for employee benefit                         | 3.132          | 2.877         | 2.441         | 2.438         | 2.595         | 2.955          | 3.850          | 4.648          | 4.927          | 7.340          | 7.346          |
| Non-operating provisions                               | 0              | 0             | 0             | 0             | 0             | 0              | 0              | 0              | 0              | 0              | 0              |
| <b>Debt equivalents</b>                                | <b>3.132</b>   | <b>2.877</b>  | <b>2.441</b>  | <b>2.438</b>  | <b>2.595</b>  | <b>2.955</b>   | <b>3.850</b>   | <b>4.648</b>   | <b>4.927</b>   | <b>7.340</b>   | <b>7.346</b>   |
| <b>Net financial position and debt equivalents</b>     | <b>87.537</b>  | <b>89.880</b> | <b>91.321</b> | <b>89.310</b> | <b>96.186</b> | <b>104.837</b> | <b>103.292</b> | <b>119.111</b> | <b>95.755</b>  | <b>106.486</b> | <b>144.829</b> |
| Minority interests                                     | (44)           | 29            | 47            | 91            | 141           | 222            | 389            | 545            | 233            | 0              | 0              |
| Shareholders' equity                                   | 13.210         | 5.726         | 1.302         | 4.146         | 2.058         | 6.891          | 19.700         | 27.525         | 54.442         | 15.758         | 19.180         |
| <b>Total equity</b>                                    | <b>13.166</b>  | <b>5.755</b>  | <b>1.349</b>  | <b>4.237</b>  | <b>2.199</b>  | <b>7.113</b>   | <b>20.089</b>  | <b>28.070</b>  | <b>54.675</b>  | <b>15.758</b>  | <b>19.180</b>  |
| <b>TOTAL SOURCE OF FINANCING</b>                       | <b>100.703</b> | <b>95.635</b> | <b>92.670</b> | <b>93.547</b> | <b>98.385</b> | <b>111.950</b> | <b>123.381</b> | <b>147.181</b> | <b>150.430</b> | <b>122.244</b> | <b>164.009</b> |



### Appendix 3.3. - Reorganized Income Statement

|   | 2015           | 2014           | 2013           | 2012           | 2011           | 2010            | 2009            | 2008            | 2007           | 2006           | 2005           |
|---|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|
| <b>Reorganized Income Statement</b>         |                |                |                |                |                |                 |                 |                 |                |                |                |
| <b>Revenues</b>                             | <b>172.354</b> | <b>161.243</b> | <b>159.024</b> | <b>162.132</b> | <b>173.949</b> | <b>184.513</b>  | <b>194.204</b>  | <b>210.206</b>  | <b>220.724</b> | <b>208.408</b> | <b>189.044</b> |
| Other income                                | 2.417          | 2.895          | 2.048          | 2.697          | 2.222          | 456             | 1.611           | 515             | 867            | 576            | 1.519          |
| Raw materials, consumables and goods        | (70.688)       | (64.360)       | (67.915)       | (62.610)       | (67.970)       | (92.981)        | (77.181)        | (92.548)        | (100.769)      | (97.427)       | (93.870)       |
| Other operating costs                       | (10.738)       | (13.413)       | (11.843)       | (21.128)       | (17.834)       | 410             | (22.735)        | (9.157)         | 3.129          | (5.465)        | (2.230)        |
| Operating cost (personnel and D&A excluded) | (44.289)       | (42.710)       | (43.422)       | (46.685)       | (53.591)       | (62.100)        | (56.509)        | (74.852)        | (70.709)       | (59.192)       | (60.345)       |
| Personnel expenses                          | (28.849)       | (25.443)       | (23.550)       | (22.401)       | (25.941)       | (32.960)        | (28.176)        | (35.987)        | (26.603)       | (22.842)       | (20.719)       |
| <b>EBITDA</b>                               | <b>20.207</b>  | <b>18.212</b>  | <b>14.342</b>  | <b>12.005</b>  | <b>10.835</b>  | <b>(2.662)</b>  | <b>11.214</b>   | <b>(1.823)</b>  | <b>26.639</b>  | <b>24.058</b>  | <b>13.399</b>  |
| Depreciation                                | (1.953)        | (1.509)        | (1.433)        | (2.141)        | (2.849)        | (5.872)         | (6.893)         | (6.954)         | (6.141)        | (7.252)        | (6.732)        |
| Amortization of operating intangibles       | (1.322)        | (907)          | (709)          | (670)          | (739)          | (1.180)         | (1.837)         | (1.436)         | (1.208)        | (558)          | (448)          |
| <i>Total D&amp;A</i>                        | <i>(3.275)</i> | <i>(2.416)</i> | <i>(2.142)</i> | <i>(2.811)</i> | <i>(3.588)</i> | <i>(7.052)</i>  | <i>(8.730)</i>  | <i>(8.390)</i>  | <i>(7.349)</i> | <i>(7.810)</i> | <i>(7.180)</i> |
| <b>EBITA</b>                                | <b>16.932</b>  | <b>15.796</b>  | <b>12.200</b>  | <b>9.194</b>   | <b>7.247</b>   | <b>(9.714)</b>  | <b>2.484</b>    | <b>(10.213)</b> | <b>19.290</b>  | <b>16.248</b>  | <b>6.219</b>   |
| Amortization of assets similar to goodwill  | (2.641)        | (3.477)        | (3.526)        | (3.412)        | (3.746)        | (4.573)         | (4.802)         | (2.904)         | (2.220)        | (2.103)        | (1.920)        |
| <b>EBIT</b>                                 | <b>14.291</b>  | <b>12.319</b>  | <b>8.674</b>   | <b>5.782</b>   | <b>3.501</b>   | <b>(14.287)</b> | <b>(2.318)</b>  | <b>(13.117)</b> | <b>17.070</b>  | <b>14.145</b>  | <b>4.299</b>   |
| Non-recurring and extraordinary items       | 133            | 103            | 2              | 1.090          | 946            | 248             | 341             | 59              | 154            | 101            | 47             |
| Interest income (expense) from investments  | (623)          | (410)          | (713)          | (45)           | (1.790)        | (607)           | 6               | (837)           | (1.095)        | (624)          | 1.155          |
| Exchange rate (losses) gains                | (1.548)        | 58             | (2.412)        | 17             | (1.652)        | 598             | 949             | (2.935)         | (1.978)        | (1.130)        | 1.280          |
| Interest (expense) income                   | (5.386)        | (4.990)        | (4.685)        | (5.165)        | (4.817)        | (4.674)         | (6.360)         | (9.160)         | (6.324)        | (7.058)        | (5.405)        |
| <i>Net financial result</i>                 | <i>(6.934)</i> | <i>(4.932)</i> | <i>(7.097)</i> | <i>(5.148)</i> | <i>(6.469)</i> | <i>(4.076)</i>  | <i>(5.411)</i>  | <i>(12.095)</i> | <i>(8.302)</i> | <i>(8.188)</i> | <i>(4.125)</i> |
| <b>EBT</b>                                  | <b>6.867</b>   | <b>7.080</b>   | <b>866</b>     | <b>1.679</b>   | <b>(3.812)</b> | <b>(18.722)</b> | <b>(7.382)</b>  | <b>(25.990)</b> | <b>7.827</b>   | <b>5.434</b>   | <b>1.376</b>   |
| Taxes                                       | (2.848)        | (2.945)        | (1.649)        | (732)          | 911            | 11              | (2.748)         | 2.399           | (3.725)        | (2.953)        | (1.317)        |
| <b>Group Net Income</b>                     | <b>4.019</b>   | <b>4.135</b>   | <b>(783)</b>   | <b>947</b>     | <b>(2.901)</b> | <b>(18.711)</b> | <b>(10.130)</b> | <b>(23.591)</b> | <b>4.102</b>   | <b>2.481</b>   | <b>59</b>      |
| Minority result                             | 64             | 11             | 37             | 44             | 60             | 54              | 265             | 99              | 0              | 0              | 0              |
| <b>NET INCOME</b>                           | <b>4.083</b>   | <b>4.146</b>   | <b>(746)</b>   | <b>991</b>     | <b>(2.841)</b> | <b>(18.657)</b> | <b>(9.865)</b>  | <b>(23.492)</b> | <b>4.102</b>   | <b>2.481</b>   | <b>59</b>      |

### Appendix 3.4. - NOPLAT calculation

|                           | 2015          | 2014          | 2013         | 2012         | 2011         | 2010            | 2009           | 2008            | 2007          | 2006          | 2005         |
|---------------------------|---------------|---------------|--------------|--------------|--------------|-----------------|----------------|-----------------|---------------|---------------|--------------|
| <b>NOPLAT calculation</b> |               |               |              |              |              |                 |                |                 |               |               |              |
| EBITA                     | 16.932        | 15.796        | 12.200       | 9.194        | 7.247        | (9.714)         | 2.484          | (10.213)        | 19.290        | 16.248        | 6.219        |
| Operating taxes           | (5.738)       | (5.489)       | (4.931)      | (2.891)      | (2.309)      | (2.659)         | (5.635)        | (2.083)         | (7.001)       | (6.029)       | (2.677)      |
| <b>NOPLAT</b>             | <b>11.194</b> | <b>10.307</b> | <b>7.269</b> | <b>6.303</b> | <b>4.938</b> | <b>(12.373)</b> | <b>(3.151)</b> | <b>(12.296)</b> | <b>12.290</b> | <b>10.219</b> | <b>3.542</b> |

Appendix 3.5. - Operating taxes calculation

|  | 2015           | 2014           | 2013           | 2012           | 2011           | 2010           | 2009           | 2008           | 2007           | 2006           | 2005           |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Operating taxes calculation</b>         |                |                |                |                |                |                |                |                |                |                |                |
| EBT  | 6.867,0        | 7.080,0        | 866,0          | 1.679,0        | (3.812,0)      | (18.722,0)     | (7.382,0)      | (25.990,0)     | 7.827,0        | 5.434,0        | 1.376,0        |
| Income taxes                               | (2.848,0)      | (2.945,0)      | (1.649,0)      | (732,0)        | 911,0          | 11,0           | (2.748,0)      | 2.399,0        | (3.725,0)      | (2.953,0)      | (1.317,0)      |
| <b>Actual (blended global) tax rate</b>    | <b>41,5%</b>   | <b>41,6%</b>   | <b>190,4%</b>  | <b>43,6%</b>   | <b>-23,9%</b>  | <b>-0,1%</b>   | <b>-37,2%</b>  | <b>-9,2%</b>   | <b>47,6%</b>   | <b>54,3%</b>   | <b>95,7%</b>   |
| <i>Adjustments:</i>                        |                |                |                |                |                |                |                |                |                |                |                |
| Amortization of assets similar to goodwill | (2.641,2)      | (3.477,0)      | (3.525,6)      | (3.411,7)      | (3.746,1)      | (4.573,0)      | (4.802,3)      | (2.904,1)      | (2.220,4)      | (2.102,8)      | (1.920,0)      |
| Estimated tax rate                         | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            |
| <i>Taxes</i>                               | <i>829,3</i>   | <i>1.091,8</i> | <i>1.107,0</i> | <i>1.071,3</i> | <i>1.176,3</i> | <i>1.435,9</i> | <i>1.507,9</i> | <i>911,9</i>   | <i>697,2</i>   | <i>660,3</i>   | <i>602,9</i>   |
| Non-recurring and extraordinary items      | 133,0          | 103,0          | 2,0            | 1.090,0        | 946,0          | 248,0          | 341,0          | 59,0           | 154,0          | 101,0          | 47,0           |
| Estimated tax rate                         | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            |
| <i>Taxes</i>                               | <i>(41,8)</i>  | <i>(32,3)</i>  | <i>(0,6)</i>   | <i>(342,3)</i> | <i>(297,0)</i> | <i>(77,9)</i>  | <i>(107,1)</i> | <i>(18,5)</i>  | <i>(48,4)</i>  | <i>(31,7)</i>  | <i>(14,8)</i>  |
| Interest income (expense) from investments | (623,0)        | (410,0)        | (713,0)        | (45,0)         | (1.790,0)      | (607,0)        | 6,0            | (837,0)        | (1.095,0)      | (624,0)        | 1.155,0        |
| Estimated tax rate                         | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            |
| <i>Taxes</i>                               | <i>195,6</i>   | <i>128,7</i>   | <i>223,9</i>   | <i>14,1</i>    | <i>562,1</i>   | <i>190,6</i>   | <i>(1,9)</i>   | <i>262,8</i>   | <i>343,8</i>   | <i>195,9</i>   | <i>(362,7)</i> |
| Net financial result                       | (6.934,0)      | (4.932,0)      | (7.097,0)      | (5.148,0)      | (6.469,0)      | (4.076,0)      | (5.411,0)      | (12.095,0)     | (8.302,0)      | (8.188,0)      | (4.125,0)      |
| Estimated tax rate                         | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            | 0,3            |
| <i>Taxes</i>                               | <i>1.906,9</i> | <i>1.356,3</i> | <i>1.951,7</i> | <i>1.415,7</i> | <i>1.779,0</i> | <i>1.120,9</i> | <i>1.488,0</i> | <i>3.326,1</i> | <i>2.283,1</i> | <i>2.251,7</i> | <i>1.134,4</i> |
| Estimated taxes on EBITA                   | (5.738,0)      | (5.489,5)      | (4.931,0)      | (2.890,8)      | (2.309,3)      | (2.658,6)      | (5.635,0)      | (2.083,3)      | (7.000,7)      | (6.029,2)      | (2.676,8)      |
| EBITA                                      | 16.932,2       | 15.796,0       | 12.199,6       | 9.193,7        | 7.247,1        | (9.714,0)      | 2.484,3        | (10.212,9)     | 19.290,4       | 16.247,8       | 6.219,0        |
| Estimated tax rate on EBITA                | 33,9%          | 34,8%          | 40,4%          | 31,4%          | 31,9%          | -27,4%         | 226,8%         | -20,4%         | 36,3%          | 37,1%          | 43,0%          |
| Taxes on EBITA                             | (5.738,0)      | (5.489,5)      | (4.931,0)      | (2.890,8)      | (2.309,3)      | (2.658,6)      | (5.635,0)      | (2.083,3)      | (7.000,7)      | (6.029,2)      | (2.676,8)      |
| Adjustments on taxes                       | 2.890,0        | 2.544,5        | 3.282,0        | 2.158,8        | 3.220,3        | 2.669,6        | 2.887,0        | 4.482,3        | 3.275,7        | 3.076,2        | 1.359,8        |
| Taxes on EBT                               | (2.848,0)      | (2.945,0)      | (1.649,0)      | (732,0)        | 911,0          | 11,0           | (2.748,0)      | 2.399,0        | (3.725,0)      | (2.953,0)      | (1.317,0)      |

Appendix 3.6. - Cash Flow Statement

|   | 2015           | 2014           | 2013           | 2012          | 2011           | 2010            | 2009           | 2008            | 2007            | 2006           |
|---|----------------|----------------|----------------|---------------|----------------|-----------------|----------------|-----------------|-----------------|----------------|
| <b>Free Cash Flow calculation</b>                             |                |                |                |               |                |                 |                |                 |                 |                |
| <b>NOPLAT</b>   | <b>11.194</b>  | <b>10.307</b>  | <b>7.269</b>   | <b>6.303</b>  | <b>4.938</b>   | <b>(12.373)</b> | <b>(3.151)</b> | <b>(12.296)</b> | <b>12.290</b>   | <b>10.219</b>  |
| Amortization of operating intangibles                         | 1.322          | 907            | 709            | 670           | 739            | 1.180           | 1.837          | 1.436           | 1.208           | 558            |
| Depreciation  | 1.953          | 1.509          | 1.433          | 2.141         | 2.849          | 5.872           | 6.893          | 6.954           | 6.141           | 7.252          |
| <b>Gross cash flow</b>  | <b>14.469</b>  | <b>12.723</b>  | <b>9.411</b>   | <b>9.114</b>  | <b>8.526</b>   | <b>(5.321)</b>  | <b>5.579</b>   | <b>(3.906)</b>  | <b>19.638</b>   | <b>18.029</b>  |
| Change in operating working capital                           | (602)          | 2.176          | (6.814)        | (449)         | 13.951         | 1.799           | 17.872         | 4.513           | (21.581)        | 6.793          |
| Net capital expenditures                                      | (6.031)        | (4.171)        | (721)          | (5.212)       | 4.075          | (964)           | (634)          | (13.294)        | (13.674)        | 30.603         |
| Change in other operating assets and liabilities              | (2.327)        | (3.970)        | 3.087          | 7.355         | (4.280)        | 3.396           | (5.901)        | 2.052           | (4.638)         | 475            |
| <i>Gross investment</i>                                       | <i>(8.960)</i> | <i>(5.965)</i> | <i>(4.448)</i> | <i>1.694</i>  | <i>13.746</i>  | <i>4.231</i>    | <i>11.337</i>  | <i>(6.729)</i>  | <i>(39.892)</i> | <i>37.871</i>  |
| <b>Free cash flow before goodwill and similar intangibles</b> | <b>5.509</b>   | <b>6.757</b>   | <b>4.963</b>   | <b>10.808</b> | <b>22.272</b>  | <b>(1.089)</b>  | <b>16.916</b>  | <b>(10.635)</b> | <b>(20.254)</b> | <b>55.900</b>  |
| Investments in goodwill and other intangibles                 | (2.035)        | (3.274)        | (2.527)        | (3.042)       | (1.804)        | (4.306)         | (3.671)        | (63)            | (1.445)         | (3.243)        |
| <b>Free cash flow after goodwill and similar intangibles</b>  | <b>3.474</b>   | <b>3.483</b>   | <b>2.436</b>   | <b>7.766</b>  | <b>20.467</b>  | <b>(5.396)</b>  | <b>13.245</b>  | <b>(10.698)</b> | <b>(21.699)</b> | <b>52.656</b>  |
| Investments in non-operating assets                           | 12             | 381            | 2.184          | (37)          | (5.711)        | (119)           | 2.602          | (1.253)         | 3.582           | (2.775)        |
| Non-recurring extraordinary items                             | 133            | 103            | 2              | 1.090         | 946            | 248             | 341            | 59              | 154             | 101            |
| Interest income (expense) from investments                    | (623)          | (410)          | (713)          | (45)          | (1.790)        | (607)           | 6              | (837)           | (1.095)         | (624)          |
| Non-operating taxes   | 2.890          | 2.544          | 3.282          | 2.159         | 3.220          | 2.670           | 2.887          | 4.482           | 3.276           | 3.076          |
| <i>Non-operating cash flow</i>                                | <i>2.412</i>   | <i>2.618</i>   | <i>4.755</i>   | <i>3.167</i>  | <i>(3.335)</i> | <i>2.192</i>    | <i>5.836</i>   | <i>2.451</i>    | <i>5.917</i>    | <i>(222)</i>   |
| <b>Cash available to investors</b>                            | <b>5.886</b>   | <b>6.102</b>   | <b>7.191</b>   | <b>10.933</b> | <b>17.133</b>  | <b>(3.204)</b>  | <b>19.081</b>  | <b>(8.247)</b>  | <b>(15.782)</b> | <b>52.434</b>  |
| Net financial result  | (6.934)        | (4.932)        | (7.097)        | (5.148)       | (6.469)        | (4.076)         | (5.411)        | (12.095)        | (8.302)         | (8.188)        |
| Change in debt equivalents                                    | 255            | 436            | 3              | (157)         | (360)          | (895)           | (798)          | (279)           | (2.413)         | (6)            |
| Change in minority interests                                  | (9)            | (7)            | (7)            | (6)           | (21)           | (113)           | 109            | 411             | 233             | 0              |
| Change in shareholders' equity                                | 3.401          | 278            | (2.098)        | 1.097         | (1.992)        | 5.848           | 2.040          | (3.425)         | 34.582          | (5.903)        |
| <b>Decrease (increase) in net financial position</b>          | <b>2.599</b>   | <b>1.877</b>   | <b>(2.008)</b> | <b>6.719</b>  | <b>8.291</b>   | <b>(2.440)</b>  | <b>15.021</b>  | <b>(23.635)</b> | <b>8.318</b>    | <b>38.337</b>  |
| <b>Beginning net financial position</b>                       | <b>87.003</b>  | <b>88.880</b>  | <b>86.872</b>  | <b>93.591</b> | <b>101.882</b> | <b>99.442</b>   | <b>114.463</b> | <b>90.828</b>   | <b>99.146</b>   | <b>137.483</b> |
| <b>Ending net financial position</b>                          | <b>84.405</b>  | <b>87.003</b>  | <b>88.880</b>  | <b>86.872</b> | <b>93.591</b>  | <b>101.882</b>  | <b>99.442</b>  | <b>114.463</b>  | <b>90.828</b>   | <b>99.146</b>  |

### Appendix 3.7. - Ratio Analysis

|  | 2015  | 2014   | 2013   | 2012  | 2011    | 2010    | 2009    | 2008    | 2007  | 2006   | 2005  |
|--|-------|--------|--------|-------|---------|---------|---------|---------|-------|--------|-------|
| <b>Financial ratio</b>                               |       |        |        |       |         |         |         |         |       |        |       |
| <b>Profitability</b>                                 |       |        |        |       |         |         |         |         |       |        |       |
| ROE  | 43,1% | 118,0% | -27,4% | 31,9% | -63,5%  | -140,3% | -41,8%  | -57,3%  | 11,7% | 14,2%  | 0,3%  |
| ROIC   | 12,2% | 11,8%  | 8,5%   | 7,2%  | 5,0%    | -10,8%  | -2,4%   | -8,6%   | 9,4%  | 7,5%   | 2,2%  |
| Premium over book capital                            | 1,15  | 1,16   | 1,17   | 1,18  | 1,17    | 1,16    | 1,14    | 1,15    | 1,18  | 1,17   | 1,14  |
| ROIC without goodwill                                | 14,0% | 13,6%  | 10,0%  | 8,6%  | 5,8%    | -12,5%  | -2,7%   | -9,8%   | 11,2% | 8,8%   | 2,5%  |
| Pretax ROIC  | 21,1% | 20,9%  | 16,8%  | 12,5% | 8,6%    | -9,8%   | 2,2%    | -8,1%   | 17,5% | 13,9%  | 4,5%  |
| Operating margin (ROS)                               | 9,8%  | 9,8%   | 7,7%   | 5,7%  | 4,2%    | -5,3%   | 1,3%    | -4,9%   | 8,7%  | 7,8%   | 3,3%  |
| Revenues/invested capital                            | 2,15  | 2,13   | 2,19   | 2,20  | 2,06    | 1,87    | 1,69    | 1,68    | 2,01  | 1,79   | 1,36  |
| Net working capital/revenues                         | 32,0% | 34,7%  | 33,7%  | 30,8% | 32,6%   | 35,0%   | 38,3%   | 40,7%   | 34,9% | 33,4%  | 38,6% |
| Operating fixed assets/revenues                      | 15,1% | 14,8%  | 14,9%  | 14,3% | 14,8%   | 17,7%   | 20,5%   | 19,7%   | 16,2% | 24,9%  | 37,6% |
| <b>Growth rates</b>                                  |       |        |        |       |         |         |         |         |       |        |       |
| Revenues   | 6,9%  | 1,4%   | -1,9%  | -6,8% | -5,7%   | -5,0%   | -7,6%   | -4,8%   | 5,9%  | -2,1%  |       |
| EBITDA   | 11,0% | 27,0%  | 19,5%  | 10,8% | -507,0% | -123,7% | -715,1% | -106,8% | 10,7% | 79,6%  |       |
| EBITA  | 7,2%  | 29,5%  | 32,7%  | 26,9% | -174,6% | -491,0% | -124,3% | -152,9% | 18,7% | 161,3% |       |
| NOPLAT   | 8,6%  | 41,8%  | 15,3%  | 27,6% | -139,9% | 292,7%  | -74,4%  | -200,1% | 20,3% | 188,5% |       |
| IC   | 5,7%  | 3,9%   | 1,5%   | -5,4% | -17,7%  | -9,6%   | -15,0%  | -3,1%   | 27,8% | -28,0% |       |
| IC excluding goodwill                                | 7,4%  | 4,8%   | 3,2%   | -5,9% | -18,6%  | -10,8%  | -16,1%  | -1,3%   | 34,7% | -32,8% |       |
| Net working capital                                  | 1,1%  | -3,8%  | 13,6%  | 0,9%  | -21,9%  | -2,7%   | -21,4%  | -5,1%   | 32,6% | -9,3%  |       |
| Operating fixed capital                              | 11,2% | 7,6%   | -5,8%  | 10,9% | -25,9%  | -17,0%  | -18,5%  | 12,6%   | 19,4% | -54,1% |       |
| <b>Working Capital Management (Days in revenues)</b> |       |        |        |       |         |         |         |         |       |        |       |
| Working Cash   | 4     | 4      | 4      | 4     | 4       | 4       | 4       | 4       | 4     | 4      | 4     |
| Receivables  | 128   | 153    | 138    | 140   | 119     | 138     | 126     | 125     | 136   | 128    | 142   |
| Inventories  | 83    | 78     | 81     | 79    | 95      | 104     | 78      | 105     | 93    | 76     | 86    |
| Suppliers  | 85    | 102    | 78     | 81    | 85      | 105     | 84      | 87      | 91    | 78     | 87    |
| Other current assets and liabilities                 | 12    | 9      | 13     | 28    | 29      | 14      | 1       | 2       | -4    | 14     | 4     |
| Net working capital                                  | 117   | 124    | 131    | 113   | 104     | 126     | 123     | 145     | 145   | 116    | 141   |
| <b>Financial Structure</b>                           |       |        |        |       |         |         |         |         |       |        |       |
| NFP/Equity   | 6,6   | 15,6   | 67,7   | 21,1  | 43,7    | 14,7    | 5,1     | 4,2     | 1,8   | 6,8    | 7,6   |
| NFP/EBITA  | 5,2   | 5,7    | 7,5    | 9,7   | 13,3    | -10,8   | 41,6    | -11,7   | 5,0   | 6,6    | 23,3  |
| NFP/EBITDA   | 4,3   | 4,9    | 6,4    | 7,4   | 8,9     | -39,4   | 9,2     | -65,3   | 3,6   | 4,4    | 10,8  |
| <b>Coverage</b>                                      |       |        |        |       |         |         |         |         |       |        |       |
| EBIT/interest  | 2,7   | 2,5    | 1,9    | 1,1   | 0,7     | -3,1    | -0,4    | -1,4    | 2,7   | 2,0    | 0,8   |
| EBITA/interest                                       | 3,1   | 3,2    | 2,6    | 1,8   | 1,5     | -2,1    | 0,4     | -1,1    | 3,1   | 2,3    | 1,2   |
| EBITDA/interest                                      | 3,8   | 3,6    | 3,1    | 2,3   | 2,2     | -0,6    | 1,8     | -0,2    | 4,2   | 3,4    | 2,5   |
| Cash available for investors/NFP                     | 1,9   | 2,1    | 2,9    | 4,5   | 6,6     | -1,1    | 5,0     | -1,8    | -3,2  | 7,1    |       |
| FCF from operation/NFP                               | 0,04  | 0,04   | 0,03   | 0,09  | 0,21    | -0,05   | 0,13    | -0,09   | -0,23 | 0,49   |       |

Appendix 3.8. - Key financial ratios and rating

| Debt/EBITDA |       |        | EBITA/Interest expense |       |        | FCF/Debt |       |        | Score |      |        | Synthetic |
|-------------|-------|--------|------------------------|-------|--------|----------|-------|--------|-------|------|--------|-----------|
| from        | to    | Rating | from                   | to    | Rating | from     | to    | Rating | from  | to   | Rating | score     |
| 0,0         | 0,4   | AAA    | 12,5                   | 100,0 | AAA    | 1,55     | 10,00 | AAA    | 0,00  | 0,50 | AAA    | 0,25      |
| 0,4         | 1,0   | AA     | 9,5                    | 12,5  | AA     | 0,43     | 1,55  | AA     | 0,50  | 1,00 | AA     | 0,75      |
| 1,0         | 1,5   | A      | 4,5                    | 9,5   | A      | 0,31     | 0,43  | A      | 1,00  | 1,50 | A      | 1,25      |
| 1,5         | 2,3   | BBB    | 4,0                    | 4,5   | BBB    | 0,14     | 0,31  | BBB    | 1,50  | 2,50 | BBB    | 2,00      |
| 2,3         | 3,0   | BB     | 3,0                    | 4,0   | BB     | 0,08     | 0,14  | BB     | 2,50  | 3,50 | BB     | 3,00      |
| 3,0         | 5,4   | B      | 2,0                    | 3,0   | B      | 0,02     | 0,08  | B      | 3,50  | 4,50 | B      | 4,00      |
| 5,4         | 7,0   | C      | 1,0                    | 2,0   | C      | 0,01     | 0,02  | C      | 4,50  | 5,00 | C      | 4,75      |
| 7,0         | 10,0  | CC     | 0,5                    | 1,0   | CC     | 0,005    | 0,01  | CC     | 5,00  | 5,50 | CC     | 5,25      |
| 10,0        | 100,0 | CCC    | 0,0                    | 0,5   | CCC    | 0,00     | 0,005 | CCC    | 5,50  | 6,00 | CCC    | 5,75      |

| Year<br>Ratio          | 2015     |             | 2014     |             | 2013     |             | 2012     |             | 2011     |             | 2010      |             | 2009      |             | 2008       |             | 2007     |             | 2006      |             |
|------------------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|-----------|-------------|-----------|-------------|------------|-------------|----------|-------------|-----------|-------------|
|                        | Rating   | Score       | Rating   | Score       | Rating   | Score       | Rating   | Score       | Rating   | Score       | Rating    | Score       | Rating    | Score       | Rating     | Score       | Rating   | Score       | Rating    | Score       |
| Debt/EBITDA            | B        | 4,00        | B        | 4,00        | C        | 4,75        | CC       | 5,25        | CC       | 5,25        | C         | 4,75        | CC        | 5,25        | CCC        | 5,75        | B        | 4,00        | B         | 4,00        |
| EBITA/Interest expense | BB       | 3,00        | BB       | 3,00        | B        | 4,00        | C        | 4,75        | C        | 4,75        | CCC       | 5,75        | CCC       | 5,75        | CCC        | 5,75        | BBB      | 2,00        | B         | 4,00        |
| FCF/Debt               | B        | 4,00        | B        | 4,00        | B        | 4,00        | BB       | 3,00        | BBB      | 2,00        | CCC       | 5,75        | BB        | 3,00        | CCC        | 5,75        | CCC      | 5,75        | AA        | 0,75        |
| <i>Weighted score</i>  |          | <i>3,67</i> |          | <i>3,67</i> |          | <i>4,38</i> |          | <i>4,71</i> |          | <i>4,54</i> |           | <i>5,25</i> |           | <i>5,04</i> |            | <i>5,75</i> |          | <i>3,63</i> |           | <i>3,46</i> |
| <b>Rating Class</b>    | <b>B</b> |             | <b>B</b> |             | <b>B</b> |             | <b>C</b> |             | <b>C</b> |             | <b>CC</b> |             | <b>CC</b> |             | <b>CCC</b> |             | <b>B</b> |             | <b>BB</b> |             |

Appendix 3.9. - Comparison with benchmark competitor (De Longhi Group)

|  | 2015            | 2014            | 2013            | 2012            | 2011            | 2010            | 2009            | 2008            | 2007             | 2006            |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|
| <b>Reorganized Balance-Sheet (Invested Capital)</b>                |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |
| Working cash*  | 18.668          | 17.045          | 16.068          | 15.060          | 14.062          | 12.599          | 13.793          | 15.036          | 14.629           | 13.347          |
| Trade receivables  | 372.072         | 366.159         | 335.233         | 381.233         | 349.490         | 387.937         | 351.879         | 367.180         | 377.982          | 348.014         |
| Inventories  | 323.420         | 317.763         | 283.415         | 273.758         | 277.984         | 288.012         | 257.084         | 320.464         | 335.194          | 323.733         |
| Trade payables   | (383.346)       | (382.545)       | (345.666)       | (351.731)       | (330.766)       | (374.184)       | (291.073)       | (286.177)       | (333.669)        | (327.088)       |
| <b>Trade working capital</b>                                       | <b>330.814</b>  | <b>318.422</b>  | <b>289.050</b>  | <b>318.320</b>  | <b>310.770</b>  | <b>314.364</b>  | <b>331.683</b>  | <b>416.503</b>  | <b>394.136</b>   | <b>358.006</b>  |
| Other operating current assets                                     | 58.480          | 100.777         | 70.011          | 61.191          | 69.794          | 40.903          | 47.759          | 56.219          | 71.963           | 41.156          |
| Other operating current liabilities                                | (104.277)       | (110.721)       | (98.161)        | (105.606)       | (97.538)        | (103.568)       | (87.326)        | (83.145)        | (79.927)         | (77.065)        |
| <b>Other current assets and liabilities</b>                        | <b>(45.797)</b> | <b>(9.944)</b>  | <b>(28.150)</b> | <b>(44.415)</b> | <b>(27.744)</b> | <b>(62.665)</b> | <b>(39.567)</b> | <b>(26.926)</b> | <b>(7.964)</b>   | <b>(35.909)</b> |
| <b>Net working capital</b>   | <b>285.017</b>  | <b>308.478</b>  | <b>260.900</b>  | <b>273.905</b>  | <b>283.026</b>  | <b>251.699</b>  | <b>292.116</b>  | <b>389.577</b>  | <b>386.172</b>   | <b>322.097</b>  |
| Tangible assets  | 197.983         | 189.904         | 171.428         | 158.584         | 109.051         | 186.431         | 177.609         | 178.488         | 202.573          | 213.522         |
| Operating intangibles  | 230.098         | 232.710         | 234.873         | 239.011         | 134.234         | 180.573         | 183.348         | 185.746         | 189.027          | 190.479         |
| <b>Total operating fixed capital</b>                               | <b>428.081</b>  | <b>422.614</b>  | <b>406.301</b>  | <b>397.595</b>  | <b>243.285</b>  | <b>367.004</b>  | <b>360.957</b>  | <b>364.234</b>  | <b>391.600</b>   | <b>404.001</b>  |
| Operating receivables and other non-current assets                 | 2.901           | 2.509           | 2.538           | 2.346           | 3.387           | 1.512           | 1.894           | 1.623           | 39.262           | 41.661          |
| Operating deferred-tax assets/(liabilities)                        | 17.329          | 22.359          | 28.011          | 34.179          | 23.131          | 14.078          | 12.756          | 20.652          | 15.623           | 20.871          |
| Operating provisions   | (50.266)        | (46.032)        | (53.113)        | (52.845)        | (61.536)        | (46.880)        | (37.717)        | (35.668)        | (31.330)         | (28.227)        |
| <b>Total other non-current operating assets and liabilities</b>    | <b>(30.036)</b> | <b>(21.164)</b> | <b>(22.564)</b> | <b>(16.320)</b> | <b>(35.018)</b> | <b>(31.290)</b> | <b>(23.067)</b> | <b>(13.393)</b> | <b>23.555</b>    | <b>34.305</b>   |
| <b>Invested capital excluding goodwill and similar intangibles</b> | <b>683.062</b>  | <b>709.928</b>  | <b>644.637</b>  | <b>655.180</b>  | <b>491.293</b>  | <b>587.413</b>  | <b>630.006</b>  | <b>740.418</b>  | <b>801.327</b>   | <b>760.403</b>  |
| Goodwill and similar intangibles                                   | 92.400          | 92.400          | 92.400          | 92.089          | 41.591          | 228.042         | 231.318         | 228.716         | 232.410          | 223.679         |
| <b>Goodwill and other similar intangibles</b>                      | <b>92.400</b>   | <b>92.400</b>   | <b>92.400</b>   | <b>92.089</b>   | <b>41.591</b>   | <b>228.042</b>  | <b>231.318</b>  | <b>228.716</b>  | <b>232.410</b>   | <b>223.679</b>  |
| <b>Invested capital including goodwill and similar intangibles</b> | <b>775.462</b>  | <b>802.328</b>  | <b>737.037</b>  | <b>747.269</b>  | <b>532.884</b>  | <b>815.455</b>  | <b>861.324</b>  | <b>969.134</b>  | <b>1.033.737</b> | <b>984.082</b>  |
| Non-operating assets   | 11.341          | 6.958           | 2.809           | 846             | 278.644         | 797             | 772             | 5.909           | 13.892           | 11.317          |
| <b>Non-operating assets and liabilities</b>                        | <b>11.341</b>   | <b>6.958</b>    | <b>2.809</b>    | <b>846</b>      | <b>278.644</b>  | <b>797</b>      | <b>772</b>      | <b>5.909</b>    | <b>13.892</b>    | <b>11.317</b>   |
| <b>TOTAL FUNDS INVESTED</b>  | <b>786.803</b>  | <b>809.286</b>  | <b>739.846</b>  | <b>748.115</b>  | <b>811.528</b>  | <b>816.252</b>  | <b>862.096</b>  | <b>975.043</b>  | <b>1.047.629</b> | <b>995.399</b>  |

|  | 2015             | 2014            | 2013           | 2012           | 2011            | 2010           | 2009           | 2008           | 2007             | 2006           |
|--|------------------|-----------------|----------------|----------------|-----------------|----------------|----------------|----------------|------------------|----------------|
| <b>Reorganized Balance-Sheet (Source of Financing)</b> |                  |                 |                |                |                 |                |                |                |                  |                |
| Excess cash  | (339.243)        | (371.485)       | (254.674)      | (228.935)      | (181.660)       | (180.916)      | (110.161)      | (94.126)       | (92.739)         | (99.605)       |
| Long-term borrowings                                   | 118.248          | 123.311         | 180.432        | 206.260        | 53.452          | 107.934        | 113.094        | 161.289        | 171.870          | 209.648        |
| Short-term borrowings                                  | 71.498           | 232.000         | 115.495        | 115.333        | 60.957          | 102.755        | 141.973        | 215.103        | 302.099          | 222.742        |
| <b>Net financial position</b>                          | <b>(149.497)</b> | <b>(16.174)</b> | <b>41.253</b>  | <b>92.658</b>  | <b>(67.251)</b> | <b>29.773</b>  | <b>144.906</b> | <b>282.266</b> | <b>381.230</b>   | <b>332.785</b> |
| Provision for employee benefit                         | 30.443           | 39.313          | 28.650         | 24.913         | 15.502          | 25.907         | 28.667         | 30.502         | 35.721           | 42.009         |
| <b>Debt equivalents</b>                                | <b>30.443</b>    | <b>39.313</b>   | <b>28.650</b>  | <b>24.913</b>  | <b>15.502</b>   | <b>25.907</b>  | <b>28.667</b>  | <b>30.502</b>  | <b>35.721</b>    | <b>42.009</b>  |
| <b>Net financial position and debt equivalents</b>     | <b>(119.054)</b> | <b>23.139</b>   | <b>69.903</b>  | <b>117.571</b> | <b>(51.749)</b> | <b>55.680</b>  | <b>173.573</b> | <b>312.768</b> | <b>416.951</b>   | <b>374.794</b> |
| Minority interests                                     | 2.973            | 2.910           | 2.530          | 2.178          | 4.237           | 1.651          | 1.678          | 2.346          | 5.458            | 5.037          |
| Shareholders' equity                                   | 902.883          | 783.237         | 667.413        | 628.366        | 859.040         | 758.921        | 686.845        | 659.929        | 625.220          | 615.568        |
| <b>Total equity</b>                                    | <b>905.856</b>   | <b>786.147</b>  | <b>669.943</b> | <b>630.544</b> | <b>863.277</b>  | <b>760.572</b> | <b>688.523</b> | <b>662.275</b> | <b>630.678</b>   | <b>620.605</b> |
| <b>TOTAL SOURCE OF FINANCING</b>                       | <b>786.803</b>   | <b>809.286</b>  | <b>739.846</b> | <b>748.115</b> | <b>811.528</b>  | <b>816.252</b> | <b>862.096</b> | <b>975.043</b> | <b>1.047.629</b> | <b>995.399</b> |

|   | 2015             | 2014             | 2013             | 2012             | 2011             | 2010             | 2009             | 2008             | 2007             | 2006             |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| <b>Reorganized Income Statement</b>         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| <b>Revenues</b>                             | <b>1.866.750</b> | <b>1.704.479</b> | <b>1.606.763</b> | <b>1.506.039</b> | <b>1.406.152</b> | <b>1.259.902</b> | <b>1.379.323</b> | <b>1.503.598</b> | <b>1.462.920</b> | <b>1.334.690</b> |
| Other income                                | 24.348           | 22.205           | 25.870           | 24.066           | 23.247           | 21.494           | 24.744           | 29.809           | 27.976           | 28.285           |
| Changes in inventories                      | 579              | 29.763           | 24.641           | 4.164            | 35.185           | 21.511           | (69.584)         | (3.891)          | 31.626           | (4.666)          |
| Raw materials, consumables and goods        | (829.148)        | (786.286)        | (730.457)        | (693.799)        | (675.075)        | (606.512)        | (627.695)        | (786.599)        | (799.322)        | (709.085)        |
| Other operating costs                       | (26.508)         | (14.695)         | (26.086)         | (25.625)         | (22.081)         | (26.297)         | (30.361)         | (22.424)         | (25.242)         | (9.695)          |
| Operating cost (personnel and D&A excluded) | (522.151)        | (489.547)        | (466.252)        | (409.686)        | (403.799)        | (361.364)        | (359.788)        | (389.666)        | (372.886)        | (349.325)        |
| Personnel expenses                          | (228.707)        | (207.003)        | (194.644)        | (179.635)        | (160.211)        | (142.113)        | (186.733)        | (190.347)        | (179.717)        | (164.633)        |
| <b>EBITDA</b>                               | <b>285.163</b>   | <b>258.916</b>   | <b>239.835</b>   | <b>225.524</b>   | <b>203.418</b>   | <b>166.621</b>   | <b>129.906</b>   | <b>140.480</b>   | <b>145.355</b>   | <b>125.571</b>   |
| Total D&A                                   | (38.882)         | (34.771)         | (33.323)         | (23.955)         | (16.767)         | (16.101)         | (23.828)         | (37.882)         | (29.031)         | (27.413)         |
| <b>EBITA</b>                                | <b>246.281</b>   | <b>224.145</b>   | <b>206.512</b>   | <b>201.569</b>   | <b>186.651</b>   | <b>150.520</b>   | <b>106.078</b>   | <b>102.598</b>   | <b>116.324</b>   | <b>98.158</b>    |
| Amortization of assets similar to goodwill  | (13.608)         | (12.047)         | (11.543)         | (11.635)         | (14.163)         | (15.051)         | (13.640)         | (13.807)         | (12.635)         | (13.204)         |
| <b>EBIT</b>                                 | <b>232.673</b>   | <b>212.098</b>   | <b>194.969</b>   | <b>189.934</b>   | <b>172.488</b>   | <b>135.469</b>   | <b>92.438</b>    | <b>88.791</b>    | <b>103.689</b>   | <b>84.954</b>    |
| Non-recurring and extraordinary items       | 0                | 643              | 0                | (971)            | (3.913)          | (5.185)          | 0                | 22.461           | 3                | 24.980           |
| Interest (expense) income                   | (33.551)         | (41.705)         | (37.876)         | (34.373)         | (33.688)         | (23.896)         | (35.263)         | (52.607)         | (51.300)         | (48.612)         |
| <b>EBT</b>                                  | <b>199.122</b>   | <b>171.036</b>   | <b>157.093</b>   | <b>154.590</b>   | <b>134.887</b>   | <b>106.388</b>   | <b>57.175</b>    | <b>58.645</b>    | <b>52.392</b>    | <b>61.322</b>    |
| Taxes                                       | (49.323)         | (43.812)         | (39.602)         | (35.728)         | (44.360)         | (31.287)         | (24.394)         | (18.256)         | (21.140)         | (20.876)         |
| <b>Group Net Income</b>                     | <b>149.799</b>   | <b>127.224</b>   | <b>117.491</b>   | <b>118.862</b>   | <b>90.527</b>    | <b>75.101</b>    | <b>32.781</b>    | <b>40.389</b>    | <b>31.252</b>    | <b>40.446</b>    |
| Minority result                             | (266)            | (692)            | (570)            | (472)            | (279)            | (186)            | (424)            | (229)            | (688)            | (670)            |
| <b>NET INCOME</b>                           | <b>149.533</b>   | <b>126.532</b>   | <b>116.921</b>   | <b>118.390</b>   | <b>90.248</b>    | <b>74.915</b>    | <b>32.357</b>    | <b>40.160</b>    | <b>30.564</b>    | <b>39.776</b>    |

|   | 2015             | 2014             | 2013            | 2012             | 2011             | 2010           | 2009           | 2008           | 2007            |
|---|------------------|------------------|-----------------|------------------|------------------|----------------|----------------|----------------|-----------------|
| <b>Free Cash Flow calculation</b>                             |                  |                  |                 |                  |                  |                |                |                |                 |
| <b>NOPLAT</b>   | <b>168.949</b>   | <b>153.763</b>   | <b>141.667</b>  | <b>138.276</b>   | <b>128.043</b>   | <b>103.257</b> | <b>72.770</b>  | <b>70.382</b>  | <b>79.798</b>   |
| Total D&A   | 38.882           | 34.771           | 33.323          | 23.955           | 16.767           | 16.101         | 23.828         | 37.882         | 29.031          |
| <b>Gross cash flow</b>  | <b>207.831</b>   | <b>188.534</b>   | <b>174.990</b>  | <b>162.231</b>   | <b>144.810</b>   | <b>119.358</b> | <b>96.598</b>  | <b>108.264</b> | <b>108.829</b>  |
| Change in operating working capital                           | 23.461           | (47.578)         | 13.006          | 9.120            | (31.327)         | 40.417         | 97.461         | (3.405)        | (64.075)        |
| Net capital expenditures                                      | (44.349)         | (51.084)         | (42.029)        | (178.265)        | 106.952          | (22.148)       | (20.551)       | (10.516)       | (16.630)        |
| Change in other operating assets and liabilities              | 8.872            | (1.400)          | 6.244           | (18.698)         | 3.728            | 8.223          | 9.674          | 36.948         | 10.750          |
| <i>Gross investment</i>                                       | <i>(12.016)</i>  | <i>(100.062)</i> | <i>(22.779)</i> | <i>(187.843)</i> | <i>79.354</i>    | <i>26.492</i>  | <i>86.584</i>  | <i>23.027</i>  | <i>(69.955)</i> |
| <b>Free cash flow before goodwill and similar intangibles</b> | <b>195.815</b>   | <b>88.472</b>    | <b>152.211</b>  | <b>(25.612)</b>  | <b>224.163</b>   | <b>145.850</b> | <b>183.181</b> | <b>131.291</b> | <b>38.874</b>   |
| Investments in goodwill and other intangibles                 | (13.608)         | (12.047)         | (11.854)        | (62.133)         | 172.288          | (11.775)       | (16.242)       | (10.113)       | (21.366)        |
| <b>Free cash flow after goodwill and similar intangibles</b>  | <b>182.207</b>   | <b>76.425</b>    | <b>140.357</b>  | <b>(87.745)</b>  | <b>396.451</b>   | <b>134.075</b> | <b>166.939</b> | <b>121.178</b> | <b>17.508</b>   |
| Investments in non-operating assets                           | (4.383)          | (4.149)          | (1.963)         | 277.798          | (277.847)        | (25)           | 5.137          | 7.983          | (2.575)         |
| Non-recurring extraordinary items                             | 0                | 643              | 0               | (971)            | (3.913)          | (5.185)        | 0              | 22.461         | 3               |
| Non-operating taxes   | 28.009           | 26.570           | 25.243          | 27.565           | 14.248           | 15.976         | 8.914          | 13.960         | 15.386          |
| <i>Non-operating cash flow</i>                                | <i>23.626</i>    | <i>23.064</i>    | <i>23.280</i>   | <i>304.392</i>   | <i>(267.512)</i> | <i>10.766</i>  | <i>14.051</i>  | <i>44.404</i>  | <i>12.814</i>   |
| <b>Cash available to investors</b>                            | <b>205.833</b>   | <b>99.489</b>    | <b>163.637</b>  | <b>216.647</b>   | <b>128.940</b>   | <b>144.841</b> | <b>180.991</b> | <b>165.582</b> | <b>30.322</b>   |
| Net financial result  | (33.551)         | (41.705)         | (37.876)        | (34.373)         | (33.688)         | (23.896)       | (35.263)       | (52.607)       | (51.300)        |
| Change in debt equivalents                                    | (8.870)          | 10.663           | 3.737           | 9.411            | (10.405)         | (2.760)        | (1.835)        | (5.219)        | (6.288)         |
| Change in minority interests                                  | (203)            | (312)            | (218)           | (2.531)          | 2.307            | (213)          | (1.092)        | (3.341)        | (267)           |
| Change in shareholders' equity                                | (29.887)         | (10.708)         | (77.874)        | (349.064)        | 9.871            | (2.839)        | (5.441)        | (5.451)        | (20.912)        |
| <b>Decrease (increase) in net financial position</b>          | <b>133.322</b>   | <b>57.427</b>    | <b>51.406</b>   | <b>(159.910)</b> | <b>97.025</b>    | <b>115.133</b> | <b>137.360</b> | <b>98.964</b>  | <b>(48.445)</b> |
| <b>Beginning net financial position</b>                       | <b>(16.174)</b>  | <b>41.253</b>    | <b>92.658</b>   | <b>(67.251)</b>  | <b>29.773</b>    | <b>144.906</b> | <b>282.266</b> | <b>381.230</b> | <b>332.785</b>  |
| <b>Ending net financial position</b>                          | <b>(149.497)</b> | <b>(16.174)</b>  | <b>41.253</b>   | <b>92.658</b>    | <b>(67.251)</b>  | <b>29.773</b>  | <b>144.906</b> | <b>282.266</b> | <b>381.230</b>  |



|  | 2015  | 2014  | 2013  | 2012  | 2011   | 2010   | 2009   | 2008   | 2007  | 2006  |
|--|-------|-------|-------|-------|--------|--------|--------|--------|-------|-------|
| <b>Financial ratio</b>                               |       |       |       |       |        |        |        |        |       |       |
| <b>Profitability</b>                                 |       |       |       |       |        |        |        |        |       |       |
| ROE  | 17,7% | 17,4% | 18,0% | 15,9% | 11,2%  | 10,4%  | 4,8%   | 6,2%   | 4,9%  | 6,5%  |
| ROIC   | 21,4% | 20,0% | 19,1% | 21,6% | 19,0%  | 12,3%  | 8,0%   | 7,0%   | 7,9%  | 6,8%  |
| Premium over book capital                            | 1,14  | 1,13  | 1,14  | 1,14  | 1,08   | 1,39   | 1,37   | 1,31   | 1,29  | 1,29  |
| ROIC without goodwill                                | 24,3% | 22,7% | 21,8% | 24,1% | 23,7%  | 17,0%  | 10,6%  | 9,1%   | 10,2% | 8,9%  |
| Pretax ROIC  | 35,4% | 33,1% | 31,8% | 35,2% | 34,6%  | 24,7%  | 15,5%  | 13,3%  | 14,9% | 12,9% |
| Operating margin (ROS)                               | 13,2% | 13,2% | 12,9% | 13,4% | 13,3%  | 11,9%  | 7,7%   | 6,8%   | 8,0%  | 7,4%  |
| Revenues/invested capital                            | 2,68  | 2,52  | 2,47  | 2,63  | 2,61   | 2,07   | 2,01   | 1,95   | 1,87  | 1,76  |
| Net working capital/revenues                         | 15,3% | 18,1% | 16,2% | 18,2% | 20,1%  | 20,0%  | 21,2%  | 25,9%  | 26,4% | 24,1% |
| Operating fixed assets/revenues                      | 22,9% | 24,8% | 25,3% | 26,4% | 17,3%  | 29,1%  | 26,2%  | 24,2%  | 26,8% | 30,3% |
| <b>Growth rates</b>                                  |       |       |       |       |        |        |        |        |       |       |
| Revenues   | 9,5%  | 6,1%  | 6,7%  | 7,1%  | 11,6%  | -8,7%  | -8,3%  | 2,8%   | 9,6%  |       |
| EBITDA   | 10,1% | 8,0%  | 6,3%  | 10,9% | 22,1%  | 28,3%  | -7,5%  | -3,4%  | 15,8% |       |
| EBITA  | 9,9%  | 8,5%  | 2,5%  | 8,0%  | 24,0%  | 41,9%  | 3,4%   | -11,8% | 18,5% |       |
| NOPLAT   | 9,9%  | 8,5%  | 2,5%  | 8,0%  | 24,0%  | 41,9%  | 3,4%   | -11,8% | 18,5% |       |
| IC   | -3,3% | 8,9%  | -1,4% | 40,2% | -34,7% | -5,3%  | -11,1% | -6,2%  | 5,0%  |       |
| IC excluding goodwill                                | -3,8% | 10,1% | -1,6% | 33,4% | -16,4% | -6,8%  | -14,9% | -7,6%  | 5,4%  |       |
| Net working capital                                  | -7,6% | 18,2% | -4,7% | -3,2% | 12,4%  | -13,8% | -25,0% | 0,9%   | 19,9% |       |
| Operating fixed capital                              | 1,3%  | 4,0%  | 2,2%  | 63,4% | -33,7% | 1,7%   | -0,9%  | -7,0%  | -3,1% |       |
| <b>Working Capital Management (Days in revenues)</b> |       |       |       |       |        |        |        |        |       |       |
| Working Cash   | 4     | 4     | 4     | 4     | 4      | 4      | 4      | 4      | 4     | 4     |
| Receivables  | 73    | 78    | 76    | 92    | 91     | 112    | 93     | 89     | 94    | 95    |
| Inventories  | 63    | 68    | 64    | 66    | 72     | 83     | 68     | 78     | 84    | 89    |
| Suppliers  | 75    | 82    | 79    | 85    | 86     | 108    | 77     | 69     | 83    | 89    |
| Other current assets and liabilities                 | 9     | 2     | 6     | 11    | 7      | 18     | 10     | 7      | 2     | 10    |
| Net working capital                                  | 56    | 66    | 59    | 66    | 73     | 73     | 77     | 95     | 96    | 88    |
| <b>Financial Structure</b>                           |       |       |       |       |        |        |        |        |       |       |
| NFP/Equity   | -0,1  | 0,0   | 0,1   | 0,2   | -0,1   | 0,1    | 0,3    | 0,5    | 0,7   | 0,6   |
| NFP/EBITA  | -0,6  | -0,1  | 0,2   | 0,5   | -0,4   | 0,2    | 1,4    | 2,8    | 3,3   | 3,4   |
| NFP/EBITDA   | -0,5  | -0,1  | 0,2   | 0,4   | -0,3   | 0,2    | 1,1    | 2,0    | 2,6   | 2,7   |
| <b>Coverage</b>                                      |       |       |       |       |        |        |        |        |       |       |
| EBIT/interest  | 6,9   | 5,1   | 5,1   | 5,5   | 5,1    | 5,7    | 2,6    | 1,7    | 2,0   | 1,7   |
| EBITA/interest                                       | 7,3   | 5,4   | 5,5   | 5,9   | 5,5    | 6,3    | 3,0    | 2,0    | 2,3   | 2,0   |
| EBITDA/interest                                      | 8,5   | 6,2   | 6,3   | 6,6   | 6,0    | 7,0    | 3,7    | 2,7    | 2,8   | 2,6   |
| Cash available for investors/NFP                     | -1,4  | -6,2  | 4,0   | 2,3   | -1,9   | 4,9    | 1,2    | 0,6    | 0,1   | 0,0   |
| FCF from operation/NFP                               | -1,22 | -4,73 | 3,40  | -0,95 | -5,90  | 4,50   | 1,15   | 0,43   | 0,05  | 0,00  |



## CHAPTER 4 - Valuation of Bialetti Group

### 4.1. Introduction

The final chapter of the thesis is dedicated to the valuation of Bialetti Group which represents an example of firm in trouble.

As previously mentioned, valuation of a firm in crisis requires particular accuracy and the use of specific adjustments in order to capture the distress effects on firm's value.

Considering Bialetti Group's crisis analyzed in chapter 3 and the main interventions specified in the restructuring plan 2014-2017, the following paragraphs will present some of the possible scenarios the Group can face in the next future. We considered as reference scenario (or *base scenario*) that is based on management expectations included in the strategic plan. Despite the base scenario, a best and a worst scenarios have been considered to include in the free cash flows projections the uncertainty about the crisis evolution. Assumptions for each scenario about economic and financial projections in the period 2016-2020 are described in paragraph 4.2.

Paragraph 4.3 focuses on the valuation of the Group by applying the Adjusted Present Value (APV) method in the explicit forecasting period and the traditional Discounted Cash Flow (DCF) formulation for continuing value. APV methodology allows to better reflect capital structure dynamics of a firms in trouble. The discount rate used in the model is the unlevered *cost of capital* ( $K_U$ ), determined using the Capital Asset Pricing Model (CAPM) technique. This choice permits to avoid the difficulty of estimating a dynamic WACC that change every year according to the debt to equity ratio, determined at market values. In the continuing value calculation a fixed and target capital structure is assumed, so in this case a fixed WACC can be applied. However, even this choice is not exempt of complications which will be analyzed and partially solved in the following.

To improve our valuation estimates, beside the DCF valuation, Option Pricing Valuation (OPV) will be applied. From the applied model it is possible to obtain the probability of default for the firm being valued that is a fundamental input of DCF model adjusted for probability of default that will be discussed in paragraph 4.5. This model can be used to improve overall valuation accuracy as it permits to limit the use of new paradigms and personal judgments.

In paragraph 4.6, it will be presented the Monte Carlo technique applied to the DCF model. This is a useful model to control the uncertainty underlying critical value drivers such as sales growth rate and raw materials costs. Moreover, this method allows to determine the entire probability distribution of the firm's enterprise value.

Finally, we conclude the thesis with a series of considerations about the results obtained and the main criticisms underlying the valuation process applied.

#### *4.2. Valuation parameters*

In the previous chapter we saw that Bialelli's strategy for the next years will be based on the development of coffee business and the network of single-branded shops. These value drivers, together with significant structural cost reduction from restructuring, should allow the Group to obtain a performance improvement and the achievement of financial and economic stability. However the firm's evolution is influenced by several risks and uncertainties that could compromise the recovery and business continuity. Even in presence of uncertainties (with particular reference to the capital increase and the results of restructuring interventions), we expect that the Group will continue to operate in the future. For this reason we adopted in our valuation framework the going concern prerequisite.

In order to take into account the risks associated with the crisis situation and the relevant uncertainties about the future, the valuation is carried out through a scenarios analysis

The creation of a reference scenario (base case) is based on the management indications included in Bialelli's certificate plan. Then, by modifying assumptions on main operating variables and considering some uncertainty profiles and conditions the firm could face in the future, a best and a worst scenarios were identified.

Enterprise value, debt value and equity value of the firm were identified for each scenario. Finally, by assigning a specific probability to each scenario we determined the firm's expected value.

31st December 2015 is the date at which our valuation makes reference. Since complete financial statements data for year 2016 are not available, this year has been considered as expected, even though we made our assumptions considering intermediate results presented by the company on 30th June 2016.

The time interval considered for the explicit forecasting period is five years. We expect in 2020 the firm will restore normal going concern conditions and reach a steady state.

Assumptions about main variables on which the valuation is based have been particularly complex given the impossibility to obtain detailed data from industrial plan, for which only

guidelines were published. Moreover, given the crisis situation, the company is not adequately covered by financial analysts. From our researches, the unique recent financial report was published by Twice Research on 3rd May 2016.

Finally, the restructuring process is based on a business model change concerning distribution strategy and markets. This makes it difficult to use historical performance for future projections. Our effort concerns to translate in quantitative amounts the qualitative guidelines indicated by the management, taking into consideration the adjustments of traditional valuation techniques illustrated in chapter 2.

#### 4.3. Scenarios analysis

Base scenario makes reference to going concern perspective draft in the certificate plan 2014-2017. Reorganization strategy is based on coffee business development and the retail channels extension thanks to the communication investments aimed to strengthen Bialetti brand. This strategy will be supported by a careful cost reduction policy. Furthermore, financial strengthening will be pursued by a capital increase and standstill agreement signed with creditor banks until 2017.

Sales growth rate underlying base case is negative in the first year of projections and then it starts to increase until reaching 5.3% in 2020. Negative sales growth rate in 2016 is due to the sale agreement reached by Bialetti for the sale of Girmi brand and patent at the end of 2016. Management communicated that Girmi brand was sold for an amount of € 4.5 million in April 2016. Moreover, we assumed that coffee business will grow at an higher rate than cookware business given the company's new business model. In our sales projections the coffee world sales pass from 51.5% in 2016 to 53.5% in 2020.

The following table illustrates the assumptions on sales growth rates in the base scenario.

Table 4.1. - Sales growth rates assumptions underlying base case

|                          | 2015 A       | 2016 E       | 2017E        | 2018 E      | 2019 E      | 2020 E      |
|--------------------------|--------------|--------------|--------------|-------------|-------------|-------------|
| Cookware                 | 6,8%         | 1,0%         | 2,0%         | 2,0%        | 3,0%        | 3,0%        |
| Grimi PED                | 58,4%        | -            | -            | -           | -           | -           |
| <i>Total House World</i> | <i>12,8%</i> | <i>-9,9%</i> | <i>-4,1%</i> | <i>2,0%</i> | <i>3,0%</i> | <i>3,0%</i> |
| Moka & Coffeemakers      | 7,9%         | 4,0%         | 5,0%         | 6,0%        | 7,0%        | 8,0%        |
| Espresso                 | -10,8%       | -5,0%        | 0,0%         | 2,0%        | 4,0%        | 5,0%        |
| <i>Total Coffe World</i> | <i>1,4%</i>  | <i>1,3%</i>  | <i>3,6%</i>  | <i>4,9%</i> | <i>6,2%</i> | <i>7,2%</i> |
| <b>Total revenues</b>    | <b>6,9%</b>  | <b>-4,4%</b> | <b>-0,1%</b> | <b>3,6%</b> | <b>4,8%</b> | <b>5,3%</b> |

EBITDA margin is expected to improve overtime as the firm will benefit from reorganization and restructuring interventions and sales increase more than operating costs. Based on our assumptions, EBITDA margin will decrease from 11.7 per cent to 9.3 per cent between 2015 and 2016. This is mainly due to the revenues slowdown expected in 2016 and the marketing expenses incurred to promote Bialetti brand in the coffee market. From 2017 EBITDA margin is expected to improve until reaching 11.8 per cent in 2020.

Depreciation and amortization is expected to vary proportionally with total operating fixed capital. We assumed that the amortization rate on total operating fixed capital is 13 per cent for every year of projections (in line with company's history).

Operating taxes amount to approximately 29.5 per cent of EBITA.

Amortization of goodwill and similar intangibles are assumed constant as in 2015 because there is no intention for Bialetti of new acquisitions.

Forecast Balance Sheet was built up considering that net working capital will increase overtime during projection period according to sales evolution. However, we assumed that net working capital policies undertaken by management with the aim to increase inventory rotation and reduce trade receivables days. Resources optimization and planning allowed the company to reduce trade working capital incidence on sales from 36.1 per cent in 2016 to 34.4 per cent in 2020.

The increase of total operating fixed capital is mainly due to investments necessary for the realization of new single-brand stores.

Best scenario, or *best case*, is based on more optimistic assumptions on sales growth rates. In particular we assumed that, after revenues slowdown in 2016, due to the sale of Girmi brand, sales will start to recover faster than in the base case.

EBITDA is assumed to increase from € 16.5 million in 2016 until € 23.4 million in the last year of projections thanks to the success of new business model. Finally, working capital policies permit to reduce TWC/sales ratio from 35.8 per cent in 2016 to 33.6 per cent in 2020.

In worst scenario the recovery of sales is much more flatter. EBITDA is expected to improve from € 15.3 million in 2016 to €17.8 million in 2020. A negative path is also visible from the evolution of the trade working capital incidence on sales which increase from 36.3 per cent in 2016 to 40.2 per cent in 2020.

Table 4.2 illustrates the economic and financial assumptions used for the analysis of the three scenarios.

Finally, for continuing value (CV) calculation we assumed a 1.0 per cent perpetual growth rate (g) in base scenario, equal to expected inflation rate in Euro zone. Growth rate used in best scenario is 1.5 per cent while in worst scenario no growth was assumed.

Forecast Income Statement, Balance Sheet and Cash Flow Statement for each of the considered scenarios are reported in appendix 4.1, 4.2 and 4.3.

*Table 4.2. - Main assumptions underlying the three scenarios*

|                       | <b>2015A</b> | <b>2016E</b> | <b>2017E</b> | <b>2018E</b> | <b>2019E</b> | <b>2020E</b> |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Base scenario</b>  |              |              |              |              |              |              |
| Sales growth          | 6,9%         | -4,4%        | -0,1%        | 3,6%         | 4,8%         | 5,3%         |
| EBITDA margin         | 11,7%        | 9,3%         | 10,7%        | 11,5%        | 11,6%        | 11,8%        |
| NWC/sales             | 32,1%        | 33,0%        | 32,5%        | 32,3%        | 31,9%        | 31,8%        |
| CAPEX/sales           | 4,8%         | 6,0%         | 6,0%         | 5,5%         | 5,5%         | 5,0%         |
| <b>Best scenario</b>  |              |              |              |              |              |              |
| Sales growth          | 6,9%         | -4,1%        | 0,3%         | 4,3%         | 6,2%         | 7,9%         |
| EBITDA margin         | 11,7%        | 10,0%        | 11,5%        | 11,8%        | 12,2%        | 12,5%        |
| NWC/sales             | 32,1%        | 32,8%        | 32,2%        | 31,8%        | 31,4%        | 31,1%        |
| CAPEX/sales           | 4,8%         | 6,0%         | 6,0%         | 5,5%         | 5,5%         | 5,0%         |
| <b>Worst scenario</b> |              |              |              |              |              |              |
| Sales growth          | 6,9%         | -4,5%        | -0,5%        | 1,4%         | 0,7%         | 0,5%         |
| EBITDA margin         | 11,7%        | 9,1%         | 9,7%         | 10,3%        | 10,3%        | 10,4%        |
| NWC/sales             | 32,1%        | 33,4%        | 34,2%        | 35,0%        | 36,2%        | 37,3%        |
| CAPEX/sales           | 4,8%         | 6,0%         | 6,0%         | 5,5%         | 5,5%         | 5,0%         |

#### *4.4. Bialetti Group valuation: APV technique in mixed version*

In this paragraph Bialetti's value will be determined by using the Adjusted Present Value method in mixed version. In this case, APV technique is used for the estimation of firm's economic value during the explicit forecasting period. While, traditional DCF/WACC approach is used for the estimation of continuing value. This methodology was considered the most coherent for Bialetti case because it reflects the dynamic characteristics of capital structure typical in the firms in crisis.

As mentioned above, the problem of using DCF approach with WACC as discount rate concerns the estimation of the market ratio between debt and equity. In fact, the conventional practice to assume a target capital structure for the entire forecasting period is not applicable because of the high volatility of projected debt/equity ratio.

Furthermore, circularity of the model is another important issue of traditional DCF/WACC approach. In fact, equity value is an important input of WACC calculation which affect at the same time the enterprise value of the firm and thus indirectly its equity value.

Estimation of the market value of debt is another important issue the analyst should not underestimate in the valuation of firms in trouble. For healthy firms nominal and market value of debt tend to coincide because there is a high probability the firm will be able to fulfill its debt payments and pay back money to debt holders. However, for firms in crisis there is a significant probability the firm will result insolvent at debt maturity or part of debt could be converted in equity during restructuring process. For this reason, market value of debt can be significantly lower than its face value making complex WACC determination.

In addition, Bialelli's debt is mainly represented by financing provided by banks in different forms and the value of these instruments cannot be observed directly in the market.

To solve all these problems simultaneously we decided to discount expected free cash flows at a rate different than WACC. Discount rate applied in APV technique is the unlevered cost of capital which can be estimated from market information of comparable firms.

In a scenarios analysis, expected free cash flows are estimated for each scenario. This allows to incorporate in the firm's value the uncertainty concerning different sales growth rates, EBITDA margin and all the other variables discussed in the previous paragraph.

Free cash flows associated to each scenario are reported in the following tables.

*Table 4.3. Free cash flows calculation (base case)*

| €/000                                | 2016         | 2017         | 2018         | 2019         | 2020         |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|
| NOPLAT                               | 8.281        | 9.370        | 10.260       | 10.580       | 11.309       |
| Change in IC excl. goodwill and s.i. | (5.347)      | (4.533)      | (5.893)      | (6.040)      | (6.000)      |
| Change in goodwill and similar int.  | 0            | 0            | 0            | 0            | 0            |
| <b>Free cash flow</b>                | <b>2.934</b> | <b>4.837</b> | <b>4.367</b> | <b>4.540</b> | <b>5.309</b> |

*Table 4.4. Free cash flows calculation (best case)*

| €/000                                | 2016         | 2017         | 2018         | 2019         | 2020         |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|
| NOPLAT                               | 9.136        | 10.328       | 10.804       | 11.730       | 12.056       |
| Change in IC excl. goodwill and s.i. | (5.143)      | (4.829)      | (5.958)      | (7.144)      | (7.547)      |
| Change in goodwill and similar int.  | 0            | 0            | 0            | 0            | 0            |
| <b>Free cash flow</b>                | <b>3.993</b> | <b>5.498</b> | <b>4.846</b> | <b>4.586</b> | <b>4.509</b> |

*Table 4.5. - Free cash flows calculation (worst case)*

| €/000                                | 2016         | 2017         | 2018         | 2019         | 2020         |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|
| NOPLAT                               | 8.299        | 8.312        | 8.679        | 8.373        | 8.256        |
| Change in IC excl. goodwill and s.i. | (7.291)      | (6.711)      | (6.441)      | (6.026)      | (4.631)      |
| Change in goodwill and similar int.  | 0            | 0            | 0            | 0            | 0            |
| <b>Free cash flow</b>                | <b>1.008</b> | <b>1.601</b> | <b>2.238</b> | <b>2.347</b> | <b>3.625</b> |



As we can observe, free cash flow of year 2020 is lower under the best case than in base case. This is due to the fact we assumed in 5 per cent capex on total sales in all the three scenarios. Since expected sales in the best scenario are higher than those expected under the base scenario, capital expenses will reduce cash flows. However, these capital expenses are related with the opening of new stores that justify an higher continuing value in the best scenario.

#### 4.4.1. Unlevered cost of capital calculation

APV method consists to determine the levered value of the firm as the sum between its unlevered value (the firm's value in absence of debt) and the fiscal benefit of debt.

The unlevered value of the firm is determined by discounting free cash flows at the unlevered cost of capital ( $K_U$ ).

To obtain  $K_U$ , CAPM formula can be employed:

$$K_U = r_f + CRP + \beta_U * MRP$$

where  $r_f$  is the risk-free rate,  $CRP$  is the country risk premium,  $\beta_U$  is the firm's unlevered beta and  $MRP$  is the market risk premium.

In this study, risk-free rate was assumed equal to 1.51%, which corresponds to the return of *Interest Rate Swap (IRS)* with 10 years maturity in Euro area. We added to risk-free rate a *country risk premium* estimated by using *Credit Default Swap (CDS)* for each country in which the Group operates weighted for the percentage of sales realized by Bialelli Group in 2015.

Table 4.6 illustrates the CRP calculation applied to Bialelli case.

Table 4.6. - Country risk premium calculation

| Country         | CRP   | % of sales    | CRP weighted |
|-----------------|-------|---------------|--------------|
| Italy           | 1,90% | 70,94%        | 1,35%        |
| Europe          | 2,15% | 23,44%        | 0,50%        |
| North America   | 1,60% | 2,20%         | 0,04%        |
| Other countries | 2,41% | 3,42%         | 0,08%        |
| <b>Total</b>    |       | <b>100,0%</b> | <b>1,97%</b> |

Market risk premium (MRP) was assumed equal to 6 per cent, in line with historical evolution and expected estimates of this rate (Damodaran, 2005)

Before proceeding with unlevered beta determination, it is necessary to introduce the concept of beta debt. In fact, to determine Bialetti's unlevered beta it is first necessary to determine beta debt ( $\beta_D$ ).

$\beta_D$  is a parameter that often it is not considered in practice of cost of capital calculation. It expresses the risk related to the firm's debt and it is assumed in most cases equal to zero. In case of healthy firms this assumption is realistic and ignoring the beta debt do not significantly affect the estimation results. However, for highly leveraged firms, as firms in trouble,  $\beta_D$  cannot be ignored because the risk of default is incorporated in the cost of debt.

Determining this component is not easy because many firms, like Bialetti, do not have bonds listed in financial market from which it is possible to estimate debt historical systematic risk. For this reason, in Bialetti case,  $\beta_D$  was determined considering firm's rating class illustrated in Appendix 3.8.

The following table illustrates reasonable beta debt associated to each rating class.

*Table 4.7. - Rating class and  $\beta_D$  (Pratt et al., 2010)*

| <i>Rating class</i> | <i>Beta Debt</i> |
|---------------------|------------------|
| AAA                 | 0,05             |
| AA                  | 0,07             |
| A                   | 0,10             |
| BBB                 | 0,14             |
| BB                  | 0,28             |
| B                   | 0,40             |
| CCC                 | 0,60             |
| CC                  | 0,80             |
| C                   | 1,00             |

To determine Bialetti's unlevered beta a bottom-up approach was applied. This consists to averaging unlevered beta obtained from a sample of comparable companies.

The firms included in the reference sample are:

- De Longhi S.p.A.
- SEB
- Leifheit AG
- Arcelik AS
- Midea Group Co Ltd
- Newell Brands Inc.
- Helen of Troy Ltd.
- Mastrad SA

- Gruppo Beghelli
- Cembre SpA
- Biesse SpA
- Sabaf SpA
- Elica S.p.A

All these firms operate in the cookware and coffee business and represent the best comparables of Bialetti.

Average or median unlevered beta computed from the sample permits to determine systematic risk of the business irrespective of capital structure.

Unlevered beta determined for each comparable company was computed by using the following formula:

$$\beta_U = \frac{\beta_L + \beta_D * \frac{D}{E}}{1 + \frac{D}{E}}$$

where  $\beta_L$  is the levered beta of each firm in the sample,  $\beta_D$  is beta debt calculated using the above mentioned approach and  $\frac{D}{E}$  is the market debt to equity ratio.

Calculations were made by considering 5 years average D/E ratio in order to avoid including temporary fluctuations. Levered beta was obtained from Reuters.com, a service provider which determines firm's beta as regression of historical returns of the firm's stock against S&P 500 index, used as proxy of the market.

Appendix 4.4 illustrates the calculations of unlevered beta for each firm in the sample. Bialetti's bottom-up unlevered beta is 0.79. By applying all the above mentioned data,  $K_U$  can be determined as follow:

$$K_U = r_f + CRP + \beta_U * MRP = 8.25\%$$

#### 4.4.2. Explicit forecasting period valuation

The estimation of Bialetti's unlevered cost capital permits to determine firm's during explicit forecasting period. By taking previously estimated free cash flows for the three scenarios and discounting them by unlevered cost of capital we can determine the firm's *business enterprise value (BEV)* for the period 2016-2020.

Tax shield valuation requires to discount fiscal benefits of debt at a rate equal to the unlevered cost of capital if we assume that fiscal benefits have the same risk of business opera-

tions. The following tables illustrate Bialetti's valuation in the three scenarios during explicit forecasting period.

Table 4.8. - APV valuation 2016-2020 (base case)

| €/000                      | 2015          | 2016  | 2017  | 2018  | 2019  | 2020  |
|----------------------------|---------------|-------|-------|-------|-------|-------|
| Free cash flow             |               | 2.934 | 4.837 | 4.367 | 4.540 | 5.309 |
| Ku                         |               | 8,25% | 8,25% | 8,25% | 8,25% | 8,25% |
| Discount Factor            |               | 0,92  | 0,85  | 0,79  | 0,73  | 0,67  |
| Present value of FCF       |               | 2.710 | 4.128 | 3.443 | 3.307 | 3.572 |
| <b>Unlevered value</b>     | <b>17.160</b> |       |       |       |       |       |
| Interest expense           |               | 4.633 | 4.559 | 4.437 | 4.319 | 4.256 |
| Tax shield (t=27,5%)       |               | 1.274 | 1.254 | 1.220 | 1.188 | 1.170 |
| PV(Tax shield)             |               | 1.177 | 1.070 | 962   | 865   | 787   |
| <b>Present value of TS</b> | <b>4.861</b>  |       |       |       |       |       |
| <b>BEV 2016-2020</b>       | <b>22.021</b> |       |       |       |       |       |

Table 4.9. - APV valuation 2016-2020 (best case)

| €/000                      | 2015          | 2016  | 2017  | 2018  | 2019  | 2020  |
|----------------------------|---------------|-------|-------|-------|-------|-------|
| Free cash flow             |               | 3.993 | 5.498 | 4.846 | 4.586 | 4.509 |
| Ku                         |               | 8,25% | 8,25% | 8,25% | 8,25% | 8,25% |
| Discount Factor            |               | 0,92  | 0,85  | 0,79  | 0,73  | 0,67  |
| Present value of FCF       |               | 3.689 | 4.692 | 3.820 | 3.340 | 3.034 |
| <b>Unlevered value</b>     | <b>18.575</b> |       |       |       |       |       |
| Interest expense           |               | 4.603 | 4.478 | 4.321 | 4.182 | 4.115 |
| Tax shield (t=27,5%)       |               | 1.266 | 1.231 | 1.188 | 1.150 | 1.132 |
| PV(Tax shield)             |               | 1.169 | 1.051 | 937   | 838   | 761   |
| <b>Present value of TS</b> | <b>4.756</b>  |       |       |       |       |       |
| <b>BEV 2016-2020</b>       | <b>23.331</b> |       |       |       |       |       |

Table 4.10. - APV valuation 2016-2020 (worst case)

| €/000                      | 2015          | 2016  | 2017  | 2018  | 2019  | 2020  |
|----------------------------|---------------|-------|-------|-------|-------|-------|
| Free cash flow             |               | 1.008 | 1.601 | 2.238 | 2.347 | 3.625 |
| Ku                         |               | 8,25% | 8,25% | 8,25% | 8,25% | 8,25% |
| Discount Factor            |               | 0,92  | 0,85  | 0,79  | 0,73  | 0,67  |
| Present value of FCF       |               | 931   | 1.366 | 1.765 | 1.709 | 2.439 |
| <b>Unlevered value</b>     | <b>8.210</b>  |       |       |       |       |       |
| Interest expense           |               | 4.687 | 4.760 | 4.799 | 4.819 | 4.827 |
| Tax shield (t=27,5%)       |               | 1.289 | 1.309 | 1.320 | 1.325 | 1.327 |
| PV(Tax shield)             |               | 1.191 | 1.117 | 1.040 | 965   | 893   |
| <b>Present value of TS</b> | <b>5.207</b>  |       |       |       |       |       |
| <b>BEV 2016-2020</b>       | <b>13.417</b> |       |       |       |       |       |

#### 4.4.3. WACC calculation

Continuing value calculation requires the application of DCF model in its traditional version. In this case we assume the firm will reach a steady state and WACC remains stable because the firm aims to reach a target capital structure after the forecasting period.

Under these assumptions, continuing value can be determined as follow:

$$CV = \frac{FCF_{CV}}{(WACC - g)}$$

where  $FCF_{CV}$  is the normalized free cash flow the first year after the explicit forecasting period,  $WACC$  is the firm's weighted average cost of capital and  $g$  is the free cash flows growth rate.

The normalized free cash flow in the year 2021 is calculated as follow:

$$FCF_{CV} = NOPLAT_{2020} * (1 + g) + \{[IC_{2020} * (1 + g)] - (IC_{2020})\}$$

Weighted average cost of capital is:

$$WACC = K_E * \frac{E}{D + E} + K_D(1 - t) * \frac{D}{D + E}$$

Since the company is expected to return to financial health after explicit forecasting period, we assumed that current relatively high debt to equity ratio will improve and converge with the industry average of 26.7 per cent (Appendix 4.4.). As a consequence:  $\frac{E}{D+E} = 78.92\%$  and  $\frac{D}{D+E} = 21.08\%$ .

In presence of risky debt, i.e. when  $\beta_D$  is different than 0 (as in Bialetti case), debt holders do not accept to earn risk-free rate but they requires a premium to remunerate the risk that the firm will be unable to fulfill its debt payments. For this reason cost of debt can be determined as:

$$K_D = r_f + \text{Default spread on debt}$$

where default spread is the spread which compensate investors from the company's risk of default. Default Spread on debt is often determined according to the rating class of the firm and the following table can be used to compute  $K_D$  after a rating analysis.

Since Bialetti is expected to converge to the average capital structure in the industry, we can reasonably assume that it will also reach the average rating class in the industry which is BBB. According to the table 4.11, a BBB rating class corresponds to a default spread of 2.50%. This means that Bialetti's cost of debt is:

$$K_D = r_f + \text{Default Spread} = 4,01\%$$

Table 4.11. - Rating class and default spread (Pratt et al., 2010)

| Rating class | Default spread |
|--------------|----------------|
| AAA          | 0,40%          |
| AA           | 0,70%          |
| A            | 1,00%          |
| BBB          | 2,50%          |
| BB           | 4,50%          |
| B            | 6,50%          |
| CCC          | 8,75%          |
| CC           | 9,50%          |
| C            | 10,50%         |

The last input we need for WACC calculation is the firm's cost of equity ( $K_E$ ). Starting from unlevered beta, we can determine cost of equity as follow:

$$\beta_L = \beta_U + \frac{D}{E}(\beta_U - \beta_D) = 0,97$$

$$K_E = r_f + CRP + \beta_L * MRP = 9.30\%$$

Finally, table 4.12 summarizes all calculations made to estimate WACC in the continuing value formula.

Table 4.12. - WACC calculations

|                                  |             |
|----------------------------------|-------------|
| Risk free rate                   | 1,5%        |
| Country risk premium             | 2,0%        |
| Equity risk premium (ERP)        | 6,0%        |
| Unlevered beta                   | 0,79        |
| Beta debt                        | 0,14        |
| Debt/Equity (D/E)                | 27,0%       |
| Beta equity                      | 0,97        |
| <b>Unlevered cost of capital</b> | <b>8,3%</b> |
| <b>Cost of equity</b>            | <b>9,3%</b> |
| Debt spread                      | 2,5%        |
| <b>Cost of debt</b>              | <b>4,0%</b> |
| Debt tax rate                    | 27,5%       |
| $K_D (1 - t)$                    | 2,9%        |
| E/EV                             | 78,9%       |
| D/EV                             | 21,1%       |
| <b>WACC</b>                      | <b>8,0%</b> |

#### 4.4.4 Business enterprise value calculation

Given free cash flow in the first year following explicit forecasting period, the growth rate  $g$  and WACC we can estimate the continuing value through the following formula:

$$CV = \frac{FCF_{cv}}{(WACC - g)}$$

The following table reports the continuing value for each considered scenario.

Table 4.13 - Continuing value calculation

| €/000                   | Base case      | Best case      | Worst case     |
|-------------------------|----------------|----------------|----------------|
| NOPLAT                  | 11.422         | 12.237         | 8.256          |
| Change in IC            | (1.108)        | (1.704)        | 0              |
| <b>Free cash flow</b>   | <b>10.314</b>  | <b>10.533</b>  | <b>8.256</b>   |
| <br>                    |                |                |                |
| $g$                     | 1,00%          | 1,50%          | 0,00%          |
| <b>Continuing value</b> | <b>148.401</b> | <b>163.295</b> | <b>107.470</b> |

The total business enterprise value (BEV) of Bialetti Group is given by the sum of the business enterprise value computed during explicit forecasting period and continuing value calculated through DCF formula.

The following table summarizes the business enterprise value associated to each scenario and the relating probability.

Table 4.14. - BEV summary

| €/000               | BEV     | Probability | Weighted BEV   |
|---------------------|---------|-------------|----------------|
| Base case           | 121.869 | 50%         | 60.934         |
| Best case           | 133.199 | 25%         | 33.300         |
| Worst case          | 85.725  | 25%         | 21.431         |
| <b>Expected BEV</b> |         | <b>100%</b> | <b>115.666</b> |

#### 4.4.5. From business enterprise value to equity value

Once estimated BEV, some steps are needed before determining firm's equity value. Equity value is the value of the firm available to shareholders. It can be obtained by using the following formula.

$$\text{Value of Equity} = \text{BEV} + \text{Non operating Assets} - \text{Debt value} - \text{Minorities}$$

Moving from enterprise value to equity value is not straightforward because estimation of market value of debt is quite critical for firms in trouble. From the inputs needed to go from BEV to equity value, the determination of the value of debt is the most critical.

As specified by Buttignon (2014), face value of the distressed firms' NFP cannot be used as a proxy of economic value of debt because there is a substantial risk of default. Various procedures can be applied to value the firm's risky debt. The most widely used approaches are:

1. *DCF model*, which estimates economic value of debt by discounting cash flows to debt (FCD) expected by the plan at a market cost of debt (obtained considering FCD timing and risk).
2. A model based on *Black, Scholes and Merton (BSM)* theory which considers risky debt as a composition of risk-free debt and a put option granted to shareholders by creditors to yield assets upon maturity to the debt's nominal value.

The two approaches can be used in a complementary manner to check consistency of application.

The starting point of DCF method is the determination of free cash flows to debt (FCD), as provided in the plan. For simplicity, in Bialetti case, the entire debt was considered into a single category. Debt value is then computed by discounting FCD at a market rate of return. The following table shows the main steps for calculating the economic value of the debt of Bialetti by applying the DCF approach

*Table 4.15. - Debt value (DCF model)*

| €/000   | 2015          | 2016         | 2017         | 2018         | 2019         | 2020         |
|---|---------------|--------------|--------------|--------------|--------------|--------------|
| EBIT  | 14.291        | 9.215        | 10.773       | 12.049       | 12.511       | 14.667       |
| Int. Expense (revised at the market cost of debt) |               | 8.731        | 8.116        | 8.075        | 8.030        | 6.162        |
| EBIT/Int. Expense                                 |               | 1,06         | 1,33         | 1,49         | 1,56         | 2,38         |
| Rating class                                      |               | CC           | CCC          | CCC          | CCC          | B            |
| <b>Credit or default spread</b>                   |               | <b>9,5%</b>  | <b>8,8%</b>  | <b>8,8%</b>  | <b>8,8%</b>  | <b>6,5%</b>  |
| Risk-free rate                                    |               | 0,5%         | 0,7%         | 0,9%         | 1,1%         | 1,3%         |
| <b>Market cost of debt</b>                        |               | <b>10,0%</b> | <b>9,5%</b>  | <b>9,7%</b>  | <b>9,9%</b>  | <b>7,8%</b>  |
| Reorganized debt (nominal value)                  | 87.537        | 87.076       | 84.690       | 82.670       | 80.384       | 77.616       |
| Interest expense from plan                        | 6.934         | 4.633        | 4.559        | 4.437        | 4.319        | 4.256        |
| Debt variation from plan                          |               | 460          | 2.387        | 2.020        | 2.286        | 2.768        |
| <b>Free cash flow to debt (FCD) from plan</b>     |               | <b>5.093</b> | <b>6.945</b> | <b>6.457</b> | <b>6.604</b> | <b>7.024</b> |
| Discount factor                                   |               | 0,91         | 0,83         | 0,76         | 0,69         | 0,69         |
| Present value of annual FCD                       |               | 4.630        | 5.798        | 4.898        | 4.536        | 4.825        |
| Present value of FCD (total)                      | 24.687        |              |              |              |              |              |
| Debt value at the end of projection period        | 53.316        |              |              |              |              | 77.616       |
| <b>Market value of debt</b>                       | <b>78.003</b> |              |              |              |              |              |
| Nominal value                                     | 87.537        |              |              |              |              |              |
| Shareholder's value of reorganization plan        | 9.534         |              |              |              |              |              |
| <b>Discount on nominal value of debt</b>          | <b>10,9%</b>  |              |              |              |              |              |



The FCD have to be discounted at the debt's fair market cost (rate of return), which may not correspond to the cost agreed with creditors and included in the restructuring plan. Indeed, it is typical in distressed firms to negotiate with creditors favorable conditions to restore the normal going concern condition. However this gives rise the problem to quantify the market cost of debt.

The proposal of Buttignon (2014), is to proceed with an iterative calculation (using a spreadsheet) along the following lines:

1. Start from the operating income (EBIT) forecast in the restructuring plan.
2. Estimate the financial expenses using market cost of debt.
3. Calculate the debt coverage ratio EBIT/Interest expenses.
4. Forecast the debt rating class, based on the previously calculated coverage ratio, and the corresponding credit default spread (see Appendix 4.5).
5. Estimate the market cost of debt as the sum of risk-free rate plus the credit default spread.
6. Compute financial expenses, multiplying the debt being restructured by the market cost of debt.

Given the estimate of the market cost of debt, we can calculate the value of debt, discontinuing at this rate the FCD forecasted in the plan.

Debt value at the end of forecasting period is assumed to be equal to nominal value. This holds if the company recovers its normal operating conditions at the end of the reorganization plan, including the capacity to remunerate creditors at a fair market return.

The difference between debt value, estimated using DCF, and the corresponding face value at the valuation date is the sacrifice asked of creditors to facilitate business continuity and, at the same time, the shareholder value of the debt from restructuring plan.

DCF model for estimating the value of the risky debt is easier to apply, anchored to the cash flows expected from the plan (FCD), but estimating the market cost of debt can be particularly difficult. Alternatively, or complementarily, we can apply a model based on the options pricing theory.

In the BSM model, debt is conceived as a combination of risk-free debt (remunerated at the risk-free rate) and a put option granted to shareholders by creditors to divest assets (EV) at the nominal value of debt. This put option exploits the situation in which, at the debt's maturity, if EV is lower than face value of debt (D), shareholders can leave the company to creditors, who will suffer a loss equal to EV minus D.

In distressed companies, the conditions granted to shareholders by creditors, as part of a restructuring plan, can give rise to a put option value (which is negative for creditors but posi-

tive for shareholders). This is due to the fact that in a distress situation, creditors find themselves ex post in a different position from that anticipated ex ante when the credit was granted and they are willing to sacrifice their value if they estimate the value of debt deriving from the firm as a going-concern as higher than for other feasible alternatives (liquidation under bankruptcy included).

Application of BSM model to Bialetti case is shown in the following table.

Table 4.16. - Debt value (BSM model)

|                                    |                |
|------------------------------------|----------------|
| <b>Enterprise value (S)</b>        | <b>128.218</b> |
| Risk-free debt value*              | 103.872        |
| Debt Duration (T)*                 | 4,43           |
| Risk-free rate                     | 1,2%           |
| Debt nominal value at maturity (K) | 114.407        |
| EV volatility                      | 39,9%          |
| d1                                 | 0,619          |
| d2                                 | -0,220         |
| N(d1)                              | 0,732          |
| N(d2)                              | 0,413          |
| <b>Equity value</b>                | <b>49.113</b>  |
| <b>Debt value</b>                  | <b>79.105</b>  |
| <b>Put value of debt</b>           | <b>24.767</b>  |

Table 4.17. - Risk free debt and duration\*

| <b>Year</b>                 | <b>0</b>       | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|-----------------------------|----------------|----------|----------|----------|----------|----------|
| FCD                         |                | 5.093    | 6.945    | 6.457    | 6.604    | 84.640   |
| Risk-free rate              |                | 0,5%     | 0,7%     | 0,9%     | 1,1%     | 1,3%     |
| Discount factor             |                | 1,00     | 0,99     | 0,97     | 0,96     | 0,94     |
| Present value of FCD        |                | 5.068    | 6.849    | 6.286    | 6.322    | 79.347   |
| <b>Risk-free debt value</b> | <b>103.872</b> |          |          |          |          |          |
| Cumulative FCD              |                | 5.068    | 13.698   | 18.858   | 25.287   | 396.734  |
| Sum of cumulative FCD       | 459.646        |          |          |          |          |          |
| <b>Duration</b>             | <b>4,43</b>    |          |          |          |          |          |

EV (previously estimated via DCF model) is the underlying asset of the put option. Under the BSM model, the debt is treated as a zero-coupon bond (that can be refunded and remunerated upon maturity). Reworking is necessary to adapt it to the typical case of debt under periodic remuneration and reimbursement. One possible (simplified) solution is to capitalize debt face value at the projected cost of debt (assumed equal to 5.5 per cent in our projections).

With these elements, assuming a measure of volatility for underlying assets, it is possible to apply BSM model. EV volatility is the most critical variable in BSM model, which can be

estimated on the basis of comparable listed companies or by running simulations with Monte Carlo technique or similar.

In Bialetti case, enterprise value volatility was assumed equal to 39.9 per cent as estimated by Damodaran at the beginning of 2016 for household industry.

Economic value of debt obtained with BSM model can be compared to that estimated with DCF model. In our example, given all the calculation assumptions, the two perspectives tend to converge to the same value. For this reason we assume that the market value of debt for Bialetti (in base scenario) is equal to € 78.6 million, which is the average value of debt obtained with DCF and BSM models. It is clear that, in the other cases, the two values may not coincide due to the numerous assumptions underlying the application of two methods (particularly the rating and market cost of debt in DCF, as well as EV volatility in BSM model). The comparison between the two perspectives is useful to enrich the valuation framework and arrive at a summary opinion.

Once estimated the BEV and D, it is possible to quantify net capital value (E). For simplicity, we assume that the value of non-operating assets is given by their face value at the valuation date. The sum between BEV and non-operating assets is the firm's enterprise value (EV).

In absence of minority interests, equity value is simply the difference between EV and D. If there are minority shareholders in the firm's subsidiaries, the value of minorities will be deducted from the calculation of equity.

At this point, it is possible to resume the scenario analysis. EV, D and E in all the alternative scenarios are shown in the following table.

*Table 4.18. - Scenarios analysis summary*

| <i>€/000</i>                  | <i>Base case (50%)</i> | <i>Best case (25%)</i> | <i>Worst case (25%)</i> |
|-------------------------------|------------------------|------------------------|-------------------------|
| Business Enterprise Value     | 121.869                | 133.199                | 85.725                  |
| Non-operating assets          | 6.349                  | 6.349                  | 6.349                   |
| <b>Total Enterprise Value</b> | <b>128.218</b>         | <b>139.548</b>         | <b>92.074</b>           |
| Debt Value                    | 78.554                 | 81.567                 | 67.866                  |
| Minorities                    | (44)                   | (44)                   | (44)                    |
| <b>Equity Value</b>           | <b>49.708</b>          | <b>58.025</b>          | <b>24.252</b>           |

Operating assumptions for each scenario were introduced previously (Table 4.2) and the valuation model, not reproduced here, is the same followed for the base case. By assigning a probability of occurrence to each scenario we can determine the expected value of equity for Bialetti Industrie S.p.A.

Table 4.19. - Expected values from scenarios analysis

|                               |                |
|-------------------------------|----------------|
| Business Enterprise Value     | 115.666        |
| Non-operating assets          | 6.349          |
| <b>Total Enterprise Value</b> | <b>122.015</b> |
| Debt Value                    | 76.635         |
| Minorities                    | (44)           |
| <b>Equity Value</b>           | <b>45.423</b>  |
| Number of shares outstanding  | 108.060        |
| <b>Value per share</b>        | <b>0,42</b>    |

In our case the expected value of equity appears in line with the average market capitalization of Bialetti in the last year. This is a demonstration that scenario analysis is a good tool for assessing the uncertainty underlying future operations of a firm in trouble.

#### 4.5. Bialetti Group Valuation: Option Pricing valuation approach

Another feasible option to value declining and distressed firms in addition to APV/DCF valuation is the *Option Pricing Valuation (OPV)*. OPV allows to estimate the potential of Bialetti Group from the success of restructuring process and the recovery of general economic conditions. This methodology permits to assign a value to uncertainty and future opportunities, so the equity value can be positive even though enterprise value is lower than face value of debt. Moreover, OPV method permits to calculate the probability of default of the Group which will be used in the following paragraph to apply the DCF method adjusted for the probability of default.

Inputs required for the implementation of OPV method are:

1. *Enterprise value of the firm (S)*. S is assumed to be equal to the sum of Bialetti's market capitalization, market value of debt and the minorities. The average market capitalization of Bialetti in the last six months of 2015 was about € 42,8 million while the value of minorities at the end of 2015 was € -44 thousands. By using these two inputs, we implement a recursive model in a spreadsheet which will compute both market value of debt and enterprise value of Bialetti. In this case, EV is not an input of the model but a variable that is derived from the same model.
2. *Enterprise value volatility ( $\sigma_A$ )*. As already illustrated in the previous paragraph, enterprise value volatility can be considered equal to 39.9% as estimated by Damodaran for the industry of household products. However, since this variable affects significantly valuation results, we made a sensitivity analysis to appreciate values variations depending on the EV volatility.

3. *Time horizon (T)*. T is equal to the duration of the firm's zero coupon debt, which was estimated in table 4.17 equal to 4,4 years.
4. *Risk-free rate ( $r_f$ )*. Risk-free rate was fixed in a prudential logic equal to 1,21 per cent, which is the return of Euro Interest Rate Swap 5 years. In this case we did not include Country Risk Premium because it is implicitly adsorbed by EV volatility.
5. *Strike price (K)*. Strike price of the option was assumed equal to face value of debt (€ 87,5 million) capitalized at the projected cost of debt (equal to 5.5 per cent). In this way, interest expenses are assumed to be paid at maturity and Bialetti's debt is considered a zero coupon debt as required by OPV approach. So, the strike price (K) is assumed equal to € 118.0 million.

By applying the BSM formula we can determine Bialetti's EV by imposing that equity value (the call option) must be equal to the sum of the firm's market capitalization of Bialetti on 31st Decemeber 2015 and the value of minorities. At the same time, by subtracting equity value and minorities to enterprise value, we can also obtain market value of debt.

Analytically we have:

$$EV = D + E + Minorities$$

where:

$$E + Minorities = EV * N(d1) - K * e^{(-r_f * T)} * N(d2) = 42.8 - 0.04 = € 42.8 \text{ million}$$

$$d1 = \frac{\ln\left(\frac{S}{D}\right) + \left(r_f + \left(\frac{\sigma^2}{2}\right)\right) * T}{\sigma * \sqrt{T}}$$

$$d2 = d1 - \sigma * \sqrt{T}$$

To find the solution of this model a spreadsheet is necessary because of the iterative calculations. By using solver tool we can indirectly find the solution of BSM model. Market value of debt resulting from the Option Pricing approach is € 78.6 million. This means that market discounts crisis situation and restructuring efforts implemented by Bialetti by applying a discount rate of 10.3% on the Net financial Position resulting at the end of 2015. This is the sacrifice asked of creditors to facilitate business continuity and, at the same time, it is the shareholder value of the debt restructuring plan.

Enterprise value of the Group amounts to € 121.3 million. Debt to equity ratio obtained using market values is 1.84, while E/EV is 35.3 per cent and D/EV is 64.7 per cent.

N(d1) is equal to 0.70 while N(d2) is equal to 0.37. Having these information we can directly obtained the risk-free probability of default for Bialetti Group which is:

$$\text{Risk – neutral probability of default} = 1 - N(d2) = 62.63\%$$

So, this means the market estimates that the value of Bialetti's assets will be lower than face value of debt with a probability of 62.67% in the next 5 years.

The following table shows EV and D computed through OPV method obtained by changing asset volatility and assuming that the equity value remains constant at € 42.8 million.

Table 4.20. - Sensitivity analysis on OPV

| Asset volatility | 30.0%   | 35.0%   | <b>39.9%</b>   | 45.0%   | 50.0%   |
|------------------|---------|---------|----------------|---------|---------|
| EV               | 134.131 | 127.640 | <b>121.315</b> | 114.922 | 108.938 |
| D                | 91.367  | 84.876  | <b>78.551</b>  | 72.158  | 66.174  |
| E                | 42.764  | 42.764  | <b>42.764</b>  | 42.764  | 42.764  |

#### 4.6. Bialetti Group Valuation: DCF model adjusted for probability of default

OPV method allowed to estimate probability of default from market data. This is a fundamental information when firm's value is estimated by using a model that explicitly considers the effects and consequences of bankruptcy, as the DCF method adjusted for probability of default. As already specified in chapter 2, this simplifies a lot the work of analyst because it permits to avoid making assumptions for every overcoming scenario.

In such a case, the firm's enterprise value is equal to the weighted average between the going concern value and the estimated liquidation value where weights are determined on the basis of probability of default. The model can be summarized as follow.

$$\text{Enterprise value} = \text{Going concern value} * (1 - \pi_{\text{distress}}) + \text{Distress sale value} * \pi_{\text{distress}}$$

The going concern value assumes that Bialetti's restructuring efforts will be successful and that the firm will return to financial health in the future. In order avoid making further assumptions, we consider that going concern value is obtained from DCF model of most probable scenario analysis which is € 121.9 million as illustrated in paragraph 4.3.4.

Liquidation value (or distress sale value) is estimated on the basis of expected proceeds in an event of a distress sale. However, distress sale proceeds are significantly more depressed than those which can be obtained from an orderly sale.

There are several ways to estimate Bialetti's liquidation value but the *earning-power-of-assets approach* is the most suitable to our case. This is mainly due to the industry in which Bialetti operates and the history of the firm which could be highly interesting for other strategic investors.

The earning power of the existing assets is estimated considering the average firm's EBIT over the last 3 years, which in Bialetti case is roughly \$11.8 million. Assuming an industry tax rate of 30 per cent and a healthy industry cost of capital of 7.95% (as estimated in paragraph 4.3.3), the distress sale proceeds can be estimated through the following formula.

$$\text{Liquidation value} = \frac{EBIT_{2013-2015} \times (1 - \text{tax rate})}{WACC} = \text{€ } 103.6 \text{ million}$$

In order to derive Bialetti's liquidation value, cash balance of € 8.6 million has to be added to arrive at a total liquidation value of € 112.2 million. This would represent a discount on book value of assets of 34%.

The probability of default at the end of 2015, determined by applying OPV approach to market data, is 62.63%.

Finally, Bialetti Group valuation obtained by using DCF method adjusted for probability of default can be performed as follow:

$$\text{Business Enterprise Value} = 121.9 * (1 - 62.63\%) + 112.2 * 62.63\% = \text{€ } 115.8 \text{ million}$$

To obtain firm's equity, we add to BEV the value of non-operating assets and we deduct the market value of debt (obtained through OPV valuation approach) and minorities. The following table summarizes all the calculations performed to value Bialetti Group by applying DCF approach adjusted for the probability of default.

*Table 4.21. – Bialetti Group valuation: DCF adjusted for probability of default*

|                                  |                |
|----------------------------------|----------------|
| <b>Liquidation value</b>         | <b>112.177</b> |
| Book value of assets             | 170.043        |
| Discount on Book value           | 34,03%         |
| <b>Going concern value</b>       | <b>121.869</b> |
| Probability of default           | 62,63%         |
| <b>Business Enterprise Value</b> | <b>115.799</b> |
| Non-operating assets             | 6.349          |
| <b>Enterprise value</b>          | <b>122.148</b> |
| Value of debt                    | 78.551         |
| Minorities                       | (44)           |
| <b>Value of equity</b>           | <b>43.641</b>  |

#### *4.7. Bialetti Group Valuation: Monte Carlo technique applied to DCF methodology*

All the methods illustrated so far attempt to introduce different adjustments in order to take into account the uncertainty underlying future economic perspectives of the Group. However, no of these methods permits to adequately represent in the firm's enterprise value the possible overcoming scenarios that could occur in the future.

In fact, given the firm's uncertainty, each of the key value drivers can assume a wide range of values and the choice to consider only a fixed value of an hypothetical distribution can represent a significant limitation in the valuation process.

One solution to the problem consists to use a stochastic model repeated numerous times in order to reveal the uncertainty about the most critical value drivers and to estimate the probability distribution of the firm's business enterprise value. Monte Carlo approach permits to achieve this purpose.

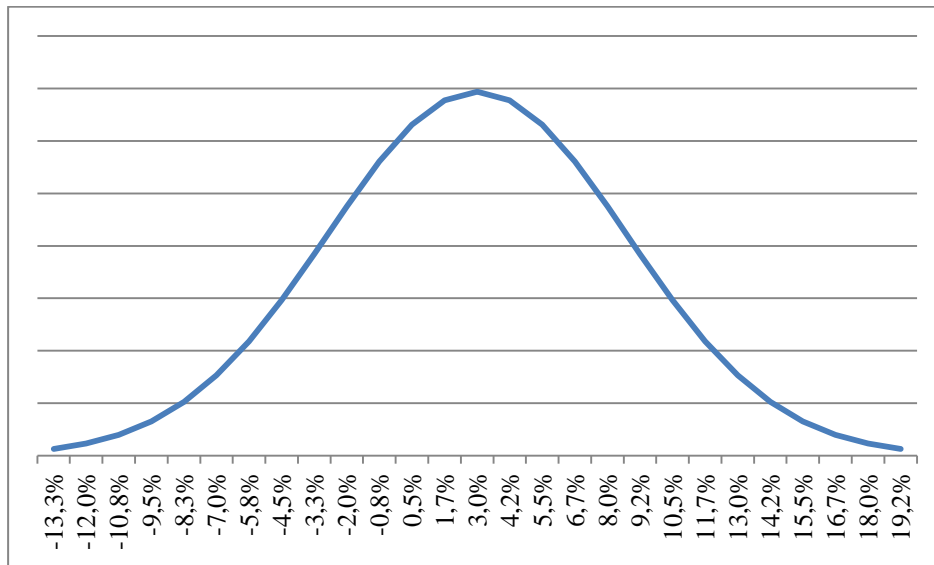
To maintain the model relatively simple, we decided to introduce only two uncertainty variables for Bialetti: the first describes the distribution of sales growth rates and the second considers the percentage incidence of raw materials costs on sales. This choice is based on the awareness that these two variables are those that mostly affect valuation results. Clearly, other assumptions can be transformed in a stochastic form but their underlying uncertainty are not so significant. They could have the only effect to increase the level of difficulty and the time required for calculations. For this reason all other assumptions were maintained fixed as illustrated in the table 4.2. for the base case in scenarios analysis.

After identifying the two critical variables in terms of uncertainty, the second step is to choose the probability distribution or the stochastic process which better fit the dynamics of identified variables. For simplicity we assumed that both variables are normally distributed. This choice is due to the fact that normal distribution depends on two parameters that can be easily estimated from past data of the firm. It is sufficient to estimate mean and standard deviation of sales growth rates and raw materials costs to obtain the two probabilities distributions necessary for applying Monte Carlo technique.

Looking at past data, mean and standard deviation for sales growth rates and raw materials costs expressed as percentage incidence on sales can be easily computed. Average sales growth rate of Bialetti Group, estimated for each forecasting period, is 2.9 per cent and the corresponding standard deviation is 5.75 per cent. The mean of the distribution was obtained by averaging the sales growth rates from explicit forecasting period hypnotized in the base case scenario. Standard deviation, instead, was determined by considering sales growth rates volatility in the past five years.

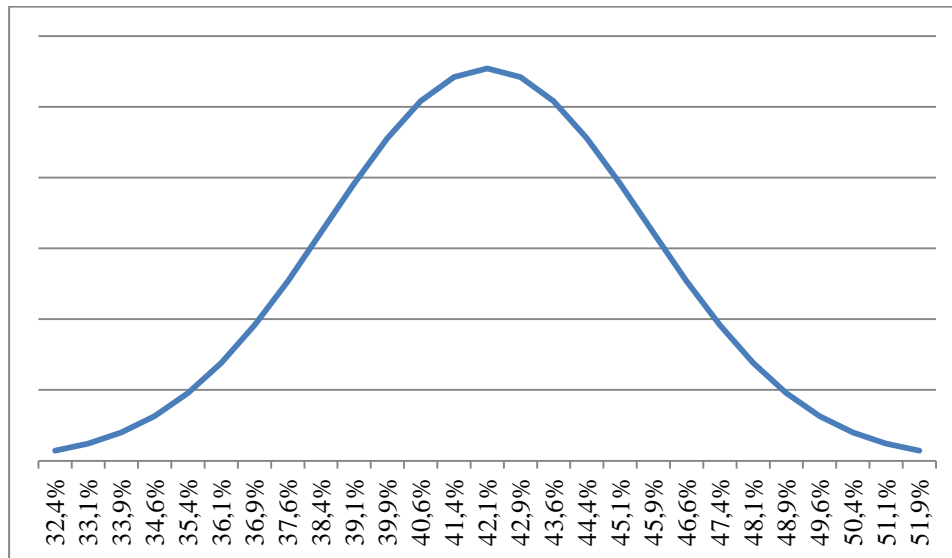


Figure 4.1. – Sales growth rate distribution for each forecasting period



The average historical incidence of raw material costs on sales is 42.3 per cent. Similarly, standard deviation of the distribution was fixed at 3.6 per cent from historical financial statements data.

Figure 4.2. – Distribution of raw materials costs expressed as incidence of sales



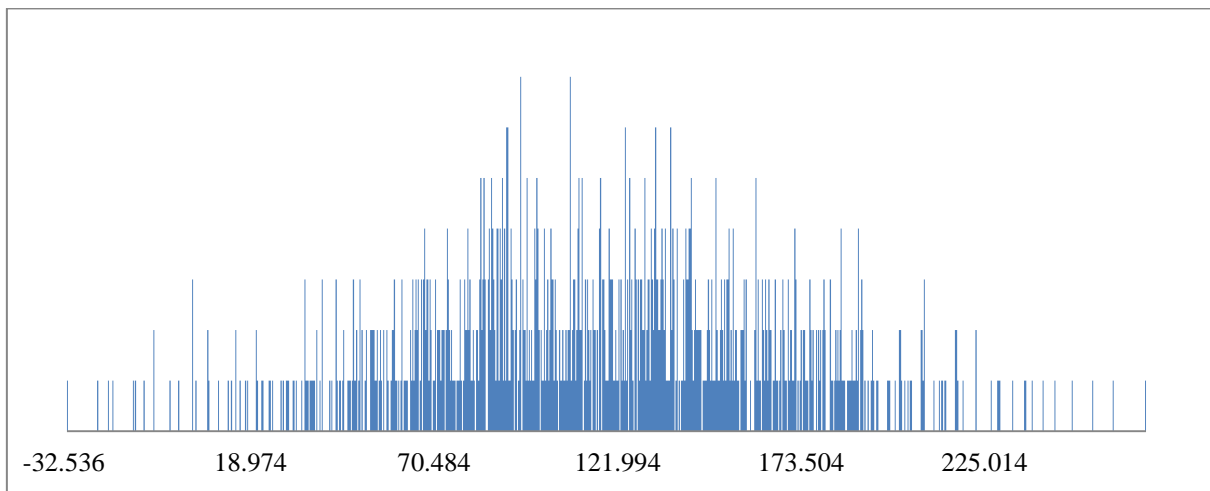
At this point, through a spreadsheet, a random value is extracted from normal distribution for both relevant variables. To compute firm’s BEV, we applied the APV technique in mixed version as illustrated in paragraph 4.3.2. Continuing value was determined using the traditional DCF/WACC approach with a perpetual growth rate of 1 per cent and WACC determined by assuming that the current debt to equity ratio will improve and converge with the

industry average of 27 per cent. In this way, the Business Enterprise value for a single simulation is obtained.

We repeated this simulation for 1.000 times using data a spreadsheet. In general, the more complex distributions are, the greater is the number of simulations required. This because more complex distributions require to estimate many parameters that can determine a wide range of values.

The following figure illustrates the distribution probability of business enterprise value obtained with 1.000 simulations.

*Figure 4.3. Bialetti's BEV distribution*



Expected value of business enterprise value is € 117.1 million with a volatility of about 41.7 per cent, which is approximately the same estimated by Damodaran for household industry and that we used in the OPV model.

Other statistics about the BEV distribution of Bialetti obtained with a Monte Carlo simulation are reported in the following table.

*Table 4.22. – Statistics about Bialetti's BEV distribution*

|              |          |
|--------------|----------|
| Expected BEV | 117.126  |
| Mean         | 116.923  |
| Relative SD  | 41,70%   |
| Minimum      | (96.400) |
| Maximum      | 301.167  |
| 1st quartile | 82.507   |
| 3rd quartile | 148.227  |
| Skweness     | 1,8      |
| Curtosis     | 3,28     |

Starting from the expected value of BEV distribution, the firm's equity value can be calculated. For simplicity, market value of debt is assumed to be equal € 76.6 million, i.e. expected market value of debt obtained in the scenarios analysis.

*Table 4.23. – Bialelli Group valuation with DCF model applied to Monte Carlo technique*

|                         |                |
|-------------------------|----------------|
| Expected BEV            | 117.126        |
| Non-operating assets    | 6.349          |
| <b>Enterprise Value</b> | <b>123.475</b> |
| Debt Value              | 76.635         |
| Minorities              | (44)           |
| <b>Equity Value</b>     | <b>46.884</b>  |

#### *4.8. Conclusions*

The goal of the thesis has been to identify the limitations of traditional valuation techniques for declining and distressed companies.

After analyzing corporate crisis topic in chapter 2, in the following chapter the analysis about predominant valuation techniques yielded that traditional methods face major problems when applied to companies in declining or distress situations. Reasons for this are linked to the conditions that firms in decline or distress face and cannot be fully captured by traditional valuation methods. In addition, these methods completely ignore one of the major risks distressed firms face, i.e. the risk of default.

After analyzing corporate crisis topic and presenting a series of possible approaches that can be applied for the valuation of firms in trouble, we focused our analysis on a case application: the crisis status and the restructuring process of Bialelli Group.

The Group started to suffer the first crisis signals at the end of 2007. Wrong management choices, high industry competition and changes of the customer's needs significantly compromised the economic and financial condition of the Group. Despite restructuring interventions put in place since 2008, the recovery was difficult and in the period 2008-2013 the Group recognized recurring significant income losses. The crisis status is clearly visible also from an analysis of the main economic and financial results with other competitors, in particular De Longhi Group.

Strategic plan 2013-2017 is based on a business model with a particular focus on retailing distribution and the relaunch of Bialelli brand in the coffee business.

Bialelli Group valuation was performed by considering the main guidelines included in the industrial plan 2013-2017. The use of several valuation methods permits to overcome the

limits that characterized each single method and determine a range of values for the enterprise value, debt value and equity value of the Group.

A summary of the valuation results obtained with the methods illustrated above is presented in the following table.

*Table 4.24. - Bialetti Group valuation summary (€/000)*

| <i>Valuation method</i> | <i>EV</i>      | <i>D</i>      | <i>E+minorities</i> |
|-------------------------|----------------|---------------|---------------------|
| Scenarios analysis      | 122.015        | 76.635        | 45.379              |
| OPV model               | 121.315        | 78.551        | 42.764              |
| DCF adjusted for PD     | 122.148        | 78.551        | 43.597              |
| Monte Carlo approach    | 123.475        | 76.635        | 46.840              |
| <b>Average values</b>   | <b>122.238</b> | <b>77.593</b> | <b>44.645</b>       |

Given the inputs and assumptions, we can reasonably conclude that the total enterprise value of Bialetti, including non-operating assets, amounts to approximately € 122.2 million at the end of 2015. The market value of debt, considering the distress conditions of the Group, can be estimated at approximately € 77.6 million with a percentage discount of 11.3 per cent on face value. So, we can conclude that the intrinsic value of Bialetti Industrie S.p.A is about € 44.6 million. When we divide this value for the number of shares outstanding at 31st December 2016 (108 million shares), we obtain a value per share of € 0.41. The market price of Bialetti at the end of 2015 was € 0.39 per share. This result suggests that the implemented valuation process addresses quite well the default risk and other characteristics of distressed firms such as Bialetti Group.

Anyway, the findings of such thesis could be analyzed and any possible distortion identified. In particular, it would be interesting to analyze the impact of the assumptions made in the models in order to find out if it is reasonable to ignore certain facts. The impact of the use of a single type of debt in the model is worth further investigation. Furthermore, a sensibility analysis of the various input variables could be performed in order to assess the impact and importance of the different inputs.

Finally, these models do not represent universal methods to be used in all distressed situations scenarios but the choice should be consider the availability and accuracy of the input data and a careful analysis of the company's situation.

Appendix 4.1. – Projections - Base scenario (€/000)

|  | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|--|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Projected Balance Sheet (Total invested capital)</b>            |                |                |                |                |                |                |
| Working cash*  | 1.724          | 1.648          | 1.646          | 1.705          | 1.786          | 1.881          |
| Trade receivables  | 60.401         | 58.683         | 58.182         | 60.259         | 62.633         | 65.978         |
| Inventories  | 39.151         | 37.467         | 36.984         | 38.304         | 39.635         | 41.752         |
| Trade payable  | (40.127)       | (38.370)       | (38.337)       | (40.173)       | (42.082)       | (44.845)       |
| <b>Trade working capital</b>                                       | <b>61.149</b>  | <b>59.428</b>  | <b>58.475</b>  | <b>60.095</b>  | <b>61.973</b>  | <b>64.767</b>  |
| Other current assets   | (5.752)        | (5.000)        | (5.000)        | (5.000)        | (5.000)        | (5.000)        |
| <b>Net working capital</b>   | <b>55.397</b>  | <b>54.428</b>  | <b>53.475</b>  | <b>55.095</b>  | <b>56.973</b>  | <b>59.767</b>  |
| <b>Total operating fixed capital</b>                               | <b>27.463</b>  | <b>33.779</b>  | <b>39.265</b>  | <b>43.538</b>  | <b>47.701</b>  | <b>50.907</b>  |
| Total other non-current operating assets and liabilities           | 130            | 130            | 130            | 130            | 130            | 130            |
| <b>Invested capital excluding goodwill and similar intangibles</b> | <b>82.990</b>  | <b>88.337</b>  | <b>92.870</b>  | <b>98.763</b>  | <b>104.804</b> | <b>110.804</b> |
| Goodwill and other similar intangibles                             | 11.364         | 8.864          | 6.364          | 3.864          | 1.364          | 0              |
| <b>Invested capital including goodwill and similar intangibles</b> | <b>94.354</b>  | <b>97.201</b>  | <b>99.234</b>  | <b>102.627</b> | <b>106.168</b> | <b>110.804</b> |
| Non-operating assets and liabilities                               | 6.349          | 6.300          | 6.300          | 6.300          | 6.300          | 6.300          |
| <b>Total funds invested</b>  | <b>100.703</b> | <b>103.501</b> | <b>105.534</b> | <b>108.927</b> | <b>112.468</b> | <b>117.104</b> |
| <b>Projected Balance Sheet (Source of financing)</b>               |                |                |                |                |                |                |
| Net financial position   | 84.405         | 84.076         | 81.690         | 79.670         | 77.384         | 74.616         |
| Debt equivalents   | 3.132          | 3.000          | 3.000          | 3.000          | 3.000          | 3.000          |
| <b>Net financial position and debt equivalents</b>                 | <b>87.537</b>  | <b>87.076</b>  | <b>84.690</b>  | <b>82.670</b>  | <b>80.384</b>  | <b>77.616</b>  |
| Minority interests   | (44)           | (44)           | (44)           | (44)           | (44)           | (44)           |
| Shareholders' equity   | 13.210         | 16.469         | 20.888         | 26.301         | 32.127         | 39.532         |
| <b>Total equity</b>  | <b>13.166</b>  | <b>16.425</b>  | <b>20.844</b>  | <b>26.257</b>  | <b>32.083</b>  | <b>39.488</b>  |
| <b>Total sources of financing</b>                                  | <b>100.703</b> | <b>103.501</b> | <b>105.534</b> | <b>108.927</b> | <b>112.468</b> | <b>117.104</b> |

|   | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|---|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Forecast Income Statement</b>            |                |                |                |                |                |                |
| <b>Revenues</b>                             | <b>172.354</b> | <b>164.765</b> | <b>164.623</b> | <b>170.500</b> | <b>178.602</b> | <b>188.141</b> |
| Other income                                | 2.417          | 2.000          | 2.000          | 2.000          | 2.000          | 2.000          |
| Raw materials, consumables and goods        | (70.688)       | (69.201)       | (68.813)       | (70.928)       | (74.120)       | (77.514)       |
| Other operating costs                       | (10.738)       | (11.185)       | (10.777)       | (11.161)       | (11.692)       | (12.316)       |
| Operating cost (personnel and D&A excluded) | (44.289)       | (46.134)       | (44.448)       | (46.035)       | (48.223)       | (50.798)       |
| Personnel expenses                          | (28.849)       | (24.959)       | (24.922)       | (24.722)       | (25.897)       | (27.281)       |
| <b>EBITDA</b>                               | <b>20.207</b>  | <b>15.285</b>  | <b>17.664</b>  | <b>19.653</b>  | <b>20.671</b>  | <b>22.232</b>  |
| Depreciation                                | (1.953)        | (2.129)        | (2.619)        | (3.044)        | (3.375)        | (3.698)        |
| Amortization of operating intangibles       | (1.322)        | (1.441)        | (1.772)        | (2.060)        | (2.285)        | (2.503)        |
| <i>Total D&amp;A</i>                        | <i>(3.275)</i> | <i>(3.570)</i> | <i>(4.391)</i> | <i>(5.104)</i> | <i>(5.660)</i> | <i>(6.201)</i> |
| <b>EBITA</b>                                | <b>16.932</b>  | <b>11.715</b>  | <b>13.273</b>  | <b>14.549</b>  | <b>15.011</b>  | <b>16.031</b>  |
| Amortization of assets similar to goodwill  | (2.641)        | (2.500)        | (2.500)        | (2.500)        | (2.500)        | (1.364)        |
| <b>EBIT</b>                                 | <b>14.291</b>  | <b>9.215</b>   | <b>10.773</b>  | <b>12.049</b>  | <b>12.511</b>  | <b>14.667</b>  |
| Non-recurring and extraordinary items       | 133            | 0              | 0              | 0              | 0              | 0              |
| Interest income (expense) from investments  | (623)          | 0              | 0              | 0              | 0              | 0              |
| Exchange rate (losses) gains                | (1.548)        | 0              | 0              | 0              | 0              | 0              |
| Interest (expense) income                   | (5.386)        | (4.633)        | (4.559)        | (4.437)        | (4.319)        | (4.256)        |
| <i>Net financial result</i>                 | <i>(6.934)</i> | <i>(4.633)</i> | <i>(4.559)</i> | <i>(4.437)</i> | <i>(4.319)</i> | <i>(4.256)</i> |
| <b>EBT</b>                                  | <b>6.867</b>   | <b>4.582</b>   | <b>6.214</b>   | <b>7.611</b>   | <b>8.192</b>   | <b>10.411</b>  |
| Taxes                                       | (2.848)        | (1.375)        | (1.864)        | (2.283)        | (2.458)        | (3.123)        |
| <b>Group Net Income</b>                     | <b>4.019</b>   | <b>3.207</b>   | <b>4.350</b>   | <b>5.328</b>   | <b>5.734</b>   | <b>7.288</b>   |
| Minority result                             | 64             | 51             | 70             | 85             | 92             | 117            |
| <b>Net Income</b>                           | <b>4.083</b>   | <b>3.259</b>   | <b>4.420</b>   | <b>5.413</b>   | <b>5.826</b>   | <b>7.404</b>   |

|                           |               |               |               |               |               |               |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>NOPLAT Calculation</b> |               |               |               |               |               |               |
| <b>EBITA</b>              | <b>16.932</b> | <b>11.715</b> | <b>13.273</b> | <b>14.549</b> | <b>15.011</b> | <b>16.031</b> |
| Operating taxes           | (5.738)       | (3.434)       | (3.903)       | (4.289)       | (4.430)       | (4.722)       |
| <b>NOPLAT</b>             | <b>11.194</b> | <b>8.281</b>  | <b>9.370</b>  | <b>10.260</b> | <b>10.580</b> | <b>11.309</b> |

**CASH FLOW STATEMENT Forecast**

|   |                |                |                |                 |                 |                 |
|---|----------------|----------------|----------------|-----------------|-----------------|-----------------|
| <b>NOPLAT</b>   | <b>11.194</b>  | <b>8.281</b>   | <b>9.370</b>   | <b>10.260</b>   | <b>10.580</b>   | <b>11.309</b>   |
| Amortization of operating intangibles                         | 1.322          | 1.441          | 1.772          | 2.060           | 2.285           | 2.503           |
| Depreciation  | 1.953          | 2.129          | 2.619          | 3.044           | 3.375           | 3.698           |
| <b>Gross cash flow</b>  | <b>14.469</b>  | <b>11.852</b>  | <b>13.761</b>  | <b>15.364</b>   | <b>16.240</b>   | <b>17.510</b>   |
| Change in operating working capital                           | (602)          | 968            | 953            | (1.620)         | (1.877)         | (2.794)         |
| Net capital expenditures                                      | (6.031)        | (9.886)        | (9.877)        | (9.377)         | (9.823)         | (9.407)         |
| Change in other operating assets and liabilities              | (2.327)        | 0              | 0              | 0               | 0               | 0               |
| <i>Gross investment</i>                                       | <i>(8.960)</i> | <i>(8.917)</i> | <i>(8.924)</i> | <i>(10.998)</i> | <i>(11.700)</i> | <i>(12.202)</i> |
| <b>Free cash flow before goodwill and similar intangibles</b> | <b>5.509</b>   | <b>2.934</b>   | <b>4.837</b>   | <b>4.367</b>    | <b>4.540</b>    | <b>5.309</b>    |
| Investments in goodwill and other intangibles                 | (2.035)        | 0              | 0              | 0               | 0               | 0               |
| <b>Free cash flow after goodwill and similar intangibles</b>  | <b>3.474</b>   | <b>2.934</b>   | <b>4.837</b>   | <b>4.367</b>    | <b>4.540</b>    | <b>5.309</b>    |
| Investments in non-operating assets                           | 12             | 49             | 0              | 0               | 0               | 0               |
| Non-recurring and extraordinary items                         | 133            | 0              | 0              | 0               | 0               | 0               |
| Interest income (expense) from investments                    | (623)          | 0              | 0              | 0               | 0               | 0               |
| Non-operating taxes   | 2.890          | 2.059          | 2.039          | 2.005           | 1.973           | 1.599           |
| <i>Non-operating cash flow</i>                                | <i>2.412</i>   | <i>2.108</i>   | <i>2.039</i>   | <i>2.005</i>    | <i>1.973</i>    | <i>1.599</i>    |
| <b>Cash available to investors</b>                            | <b>5.886</b>   | <b>5.042</b>   | <b>6.876</b>   | <b>6.372</b>    | <b>6.513</b>    | <b>6.907</b>    |
| Net financial result  | (6.934)        | (4.633)        | (4.559)        | (4.437)         | (4.319)         | (4.256)         |
| Change in debt equivalents                                    | 255            | (132)          | 0              | 0               | 0               | 0               |
| Change in minority interests                                  | (9)            | 51             | 70             | 85              | 92              | 117             |
| Change in shareholders' equity                                | 3.401          | 0              | 0              | 0               | 0               | 0               |
| <b>Decrease (increase) in net financial position</b>          | <b>2.599</b>   | <b>328</b>     | <b>2.387</b>   | <b>2.020</b>    | <b>2.286</b>    | <b>2.768</b>    |
| Beginning net financial position                              | <b>87.003</b>  | <b>84.405</b>  | <b>84.076</b>  | <b>81.690</b>   | <b>79.670</b>   | <b>77.384</b>   |
| <b>Ending net financial position</b>                          | <b>84.405</b>  | <b>84.076</b>  | <b>81.690</b>  | <b>79.670</b>   | <b>77.384</b>   | <b>74.616</b>   |

Appendix 4.2. - Projections – Best scenario (€/000)

|  | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|--|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Projected Balance Sheet (Total invested capital)</b>            |                |                |                |                |                |                |
| Working cash*  | 1.724          | 1.654          | 1.659          | 1.730          | 1.837          | 1.983          |
| Trade receivables  | 60.401         | 58.894         | 58.621         | 60.664         | 63.935         | 68.466         |
| Inventories  | 39.151         | 37.149         | 36.809         | 37.915         | 39.770         | 42.384         |
| Trade payable  | (40.127)       | (38.508)       | (38.626)       | (40.285)       | (42.791)       | (46.188)       |
| <b>Trade working capital</b>                                       | <b>61.149</b>  | <b>59.189</b>  | <b>58.462</b>  | <b>60.024</b>  | <b>62.752</b>  | <b>66.646</b>  |
| Other current assets   | (5.752)        | (5.000)        | (5.000)        | (5.000)        | (5.000)        | (5.000)        |
| <b>Net working capital</b>   | <b>55.397</b>  | <b>54.189</b>  | <b>53.462</b>  | <b>55.024</b>  | <b>57.752</b>  | <b>61.646</b>  |
| <b>Total operating fixed capital</b>                               | <b>27.463</b>  | <b>33.814</b>  | <b>39.370</b>  | <b>43.766</b>  | <b>48.183</b>  | <b>51.836</b>  |
| Total other non-current operating assets and liabilities           | 130            | 130            | 130            | 130            | 130            | 130            |
| <b>Invested capital excluding goodwill and similar intangibles</b> | <b>82.990</b>  | <b>88.133</b>  | <b>92.962</b>  | <b>98.920</b>  | <b>106.065</b> | <b>113.612</b> |
| Goodwill and other similar intangibles                             | 11.364         | 8.864          | 6.364          | 3.864          | 1.364          | 0              |
| <b>Invested capital including goodwill and similar intangibles</b> | <b>94.354</b>  | <b>96.997</b>  | <b>99.326</b>  | <b>102.784</b> | <b>107.429</b> | <b>113.612</b> |
| Non-operating assets and liabilities                               | 6.349          | 6.300          | 6.300          | 6.300          | 6.300          | 6.300          |
| <b>Total funds invested</b>  | <b>100.703</b> | <b>103.297</b> | <b>105.626</b> | <b>109.084</b> | <b>113.729</b> | <b>119.912</b> |
|  | <b>2015</b>    | <b>2016</b>    | <b>2017</b>    | <b>2018</b>    | <b>2019</b>    | <b>2020</b>    |
| <b>Projected Balance Sheet (Source of financing)</b>               |                |                |                |                |                |                |
| Net financial position   | 84.405         | 82.982         | 79.859         | 77.266         | 74.816         | 72.732         |
| Debt equivalents   | 3.132          | 3.000          | 3.000          | 3.000          | 3.000          | 3.000          |
| <b>Net financial position and debt equivalents</b>                 | <b>87.537</b>  | <b>85.982</b>  | <b>82.859</b>  | <b>80.266</b>  | <b>77.816</b>  | <b>75.732</b>  |
| Minority interests   | (44)           | (44)           | (44)           | (44)           | (44)           | (44)           |
| Shareholders' equity   | 13.210         | 17.359         | 22.811         | 28.863         | 35.957         | 44.224         |
| <b>Total equity</b>  | <b>13.166</b>  | <b>17.315</b>  | <b>22.767</b>  | <b>28.819</b>  | <b>35.913</b>  | <b>44.180</b>  |
| <b>Total sources of financing</b>                                  | <b>100.703</b> | <b>103.297</b> | <b>105.626</b> | <b>109.084</b> | <b>113.729</b> | <b>119.912</b> |



|   | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|---|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Forecast Income Statement</b>            |                |                |                |                |                |                |
| <b>Revenues</b>                             | <b>172.354</b> | <b>165.357</b> | <b>165.866</b> | <b>172.987</b> | <b>183.749</b> | <b>198.335</b> |
| Other income                                | 2.417          | 2.000          | 2.000          | 2.000          | 2.000          | 2.000          |
| Raw materials, consumables and goods        | (70.688)       | (69.946)       | (69.332)       | (72.135)       | (76.256)       | (81.912)       |
| Other operating costs                       | (10.738)       | (10.302)       | (10.334)       | (10.777)       | (11.448)       | (12.357)       |
| Operating cost (personnel and D&A excluded) | (44.289)       | (42.491)       | (42.622)       | (44.452)       | (47.217)       | (50.965)       |
| Personnel expenses                          | (28.849)       | (28.111)       | (26.539)       | (27.174)       | (28.481)       | (31.734)       |
| <b>EBITDA</b>                               | <b>20.207</b>  | <b>16.507</b>  | <b>19.040</b>  | <b>20.448</b>  | <b>22.347</b>  | <b>23.367</b>  |
| Depreciation                                | (1.953)        | (2.129)        | (2.622)        | (3.052)        | (3.393)        | (3.736)        |
| Amortization of operating intangibles       | (1.322)        | (1.441)        | (1.774)        | (2.066)        | (2.296)        | (2.528)        |
| <i>Total D&amp;A</i>                        | <i>(3.275)</i> | <i>(3.570)</i> | <i>(4.396)</i> | <i>(5.118)</i> | <i>(5.690)</i> | <i>(6.264)</i> |
| <b>EBITA</b>                                | <b>16.932</b>  | <b>12.937</b>  | <b>14.644</b>  | <b>15.330</b>  | <b>16.657</b>  | <b>17.103</b>  |
| Amortization of assets similar to goodwill  | (2.641)        | (2.500)        | (2.500)        | (2.500)        | (2.500)        | (1.364)        |
| <b>EBIT</b>                                 | <b>14.291</b>  | <b>10.437</b>  | <b>12.144</b>  | <b>12.830</b>  | <b>14.157</b>  | <b>15.740</b>  |
| Non-recurring and extraordinary items       | 133            | 0              | 0              | 0              | 0              | 0              |
| Interest income (expense) from investments  | (623)          | 0              | 0              | 0              | 0              | 0              |
| Exchange rate (losses) gains                | (1.548)        | 0              | 0              | 0              | 0              | 0              |
| Interest (expense) income                   | (5.386)        | (4.603)        | (4.478)        | (4.321)        | (4.182)        | (4.115)        |
| <i>Net financial result</i>                 | <i>(6.934)</i> | <i>(4.603)</i> | <i>(4.478)</i> | <i>(4.321)</i> | <i>(4.182)</i> | <i>(4.115)</i> |
| <b>EBT</b>                                  | <b>6.867</b>   | <b>5.834</b>   | <b>7.666</b>   | <b>8.509</b>   | <b>9.975</b>   | <b>11.625</b>  |
| Taxes                                       | (2.848)        | (1.750)        | (2.300)        | (2.553)        | (2.993)        | (3.487)        |
| <b>Group Net Income</b>                     | <b>4.019</b>   | <b>4.084</b>   | <b>5.366</b>   | <b>5.956</b>   | <b>6.983</b>   | <b>8.137</b>   |
| Minority result                             | 64             | 65             | 86             | 95             | 112            | 130            |
| <b>Net Income</b>                           | <b>4.083</b>   | <b>4.149</b>   | <b>5.452</b>   | <b>6.052</b>   | <b>7.094</b>   | <b>8.267</b>   |

|                           | 2015          | 2016          | 2017          | 2018          | 2019          | 2020          |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>NOPLAT Calculation</b> |               |               |               |               |               |               |
| <b>EBITA</b>              | <b>16.932</b> | <b>12.937</b> | <b>14.644</b> | <b>15.330</b> | <b>16.657</b> | <b>17.103</b> |
| Operating taxes           | (5.738)       | (3.801)       | (4.316)       | (4.526)       | (4.928)       | (5.047)       |
| <b>NOPLAT</b>             | <b>11.194</b> | <b>9.136</b>  | <b>10.328</b> | <b>10.804</b> | <b>11.730</b> | <b>12.056</b> |

|   | 2015           | 2016           | 2017           | 2018            | 2019            | 2020            |
|---|----------------|----------------|----------------|-----------------|-----------------|-----------------|
| <b>CASH FLOW STATEMENT Forecast</b>                           |                |                |                |                 |                 |                 |
| <b>NOPLAT</b>   | <b>11.194</b>  | <b>9.136</b>   | <b>10.328</b>  | <b>10.804</b>   | <b>11.730</b>   | <b>12.056</b>   |
| Amortization of operating intangibles                         | 1.322          | 1.441          | 1.774          | 2.066           | 2.296           | 2.528           |
| Depreciation  | 1.953          | 2.129          | 2.622          | 3.052           | 3.393           | 3.736           |
| <b>Gross cash flow</b>  | <b>14.469</b>  | <b>12.706</b>  | <b>14.724</b>  | <b>15.922</b>   | <b>17.419</b>   | <b>18.320</b>   |
| Change in operating working capital                           | (602)          | 1.208          | 727            | (1.562)         | (2.728)         | (3.894)         |
| Net capital expenditures                                      | (6.031)        | (9.921)        | (9.952)        | (9.514)         | (10.106)        | (9.917)         |
| Change in other operating assets and liabilities              | (2.327)        | 0              | 0              | 0               | 0               | 0               |
| <i>Gross investment</i>                                       | <i>(8.960)</i> | <i>(8.713)</i> | <i>(9.225)</i> | <i>(11.076)</i> | <i>(12.834)</i> | <i>(13.811)</i> |
| <b>Free cash flow before goodwill and similar intangibles</b> | <b>5.509</b>   | <b>3.993</b>   | <b>5.498</b>   | <b>4.846</b>    | <b>4.586</b>    | <b>4.509</b>    |
| Investments in goodwill and other intangibles                 | (2.035)        | 0              | 0              | 0               | 0               | 0               |
| <b>Free cash flow after goodwill and similar intangibles</b>  | <b>3.474</b>   | <b>3.993</b>   | <b>5.498</b>   | <b>4.846</b>    | <b>4.586</b>    | <b>4.509</b>    |
| Investments in non-operating assets                           | 12             | 49             | 0              | 0               | 0               | 0               |
| Non-recurring and extraordinary items                         | 133            | 0              | 0              | 0               | 0               | 0               |
| Interest income (expense) from investments                    | (623)          | 0              | 0              | 0               | 0               | 0               |
| Non-operating taxes   | 2.890          | 2.051          | 2.016          | 1.973           | 1.935           | 1.560           |
| <i>Non-operating cash flow</i>                                | <i>2.412</i>   | <i>2.100</i>   | <i>2.016</i>   | <i>1.973</i>    | <i>1.935</i>    | <i>1.560</i>    |
| <b>Cash available to investors</b>                            | <b>5.886</b>   | <b>6.093</b>   | <b>7.515</b>   | <b>6.819</b>    | <b>6.521</b>    | <b>6.069</b>    |
| Net financial result  | (6.934)        | (4.603)        | (4.478)        | (4.321)         | (4.182)         | (4.115)         |
| Change in debt equivalents                                    | 255            | (132)          | 0              | 0               | 0               | 0               |
| Change in minority interests                                  | (9)            | 65             | 86             | 95              | 112             | 130             |
| Change in shareholders' equity                                | 3.401          | 0              | 0              | 0               | 0               | 0               |
| <b>Decrease (increase) in net financial position</b>          | <b>2.599</b>   | <b>1.423</b>   | <b>3.122</b>   | <b>2.593</b>    | <b>2.450</b>    | <b>2.084</b>    |
| Beginning net financial position                              | <b>87.003</b>  | <b>84.405</b>  | <b>82.982</b>  | <b>79.859</b>   | <b>77.266</b>   | <b>74.816</b>   |
| <b>Ending net financial position</b>                          | <b>84.405</b>  | <b>82.982</b>  | <b>79.859</b>  | <b>77.266</b>   | <b>74.816</b>   | <b>72.732</b>   |

Appendix 4.3. - Projections – Worst Scenario (€/000)

|  | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|--|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Projected Balance Sheet (Total invested capital)</b>            |                |                |                |                |                |                |
| Working cash*  | 1.724          | 1.683          | 1.675          | 1.698          | 1.710          | 1.718          |
| Trade receivables  | 60.401         | 60.400         | 60.567         | 61.867         | 62.762         | 63.547         |
| Inventories  | 39.151         | 37.807         | 38.542         | 39.539         | 40.749         | 42.364         |
| Trade payable  | (40.127)       | (38.730)       | (38.542)       | (38.608)       | (38.407)       | (38.599)       |
| <b>Trade working capital</b>                                       | <b>61.149</b>  | <b>61.160</b>  | <b>62.241</b>  | <b>64.495</b>  | <b>66.814</b>  | <b>69.030</b>  |
| Other current assets   | (5.752)        | (5.000)        | (5.000)        | (5.000)        | (5.000)        | (5.000)        |
| <b>Net working capital</b>   | <b>55.397</b>  | <b>56.160</b>  | <b>57.241</b>  | <b>59.495</b>  | <b>61.814</b>  | <b>64.030</b>  |
| <b>Total operating fixed capital</b>                               | <b>27.463</b>  | <b>33.990</b>  | <b>39.620</b>  | <b>43.808</b>  | <b>47.515</b>  | <b>49.929</b>  |
| Total other non-current operating assets and liabilities           | 130            | 130            | 130            | 130            | 130            | 130            |
| <b>Invested capital excluding goodwill and similar intangibles</b> | <b>82.990</b>  | <b>90.281</b>  | <b>96.991</b>  | <b>103.432</b> | <b>109.459</b> | <b>114.089</b> |
| Goodwill and other similar intangibles                             | 11.364         | 8.864          | 6.364          | 3.864          | 1.364          | 0              |
| <b>Invested capital including goodwill and similar intangibles</b> | <b>94.354</b>  | <b>99.144</b>  | <b>103.355</b> | <b>107.296</b> | <b>110.823</b> | <b>114.089</b> |
| Non-operating assets and liabilities                               | 6.349          | 6.300          | 6.300          | 6.300          | 6.300          | 6.300          |
| <b>Total funds invested</b>  | <b>100.703</b> | <b>105.444</b> | <b>109.655</b> | <b>113.596</b> | <b>117.123</b> | <b>120.389</b> |
|  | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
| <b>Projected Balance Sheet (Source of financing)</b>               |                |                |                |                |                |                |
| Net financial position   | 84.405         | 86.042         | 87.057         | 87.457         | 87.769         | 87.154         |
| Debt equivalents   | 3.132          | 3.000          | 3.000          | 3.000          | 3.000          | 3.000          |
| <b>Net financial position and debt equivalents</b>                 | <b>87.537</b>  | <b>89.042</b>  | <b>90.057</b>  | <b>90.457</b>  | <b>90.769</b>  | <b>90.154</b>  |
| Minority interests   | (44)           | (44)           | (44)           | (44)           | (44)           | (44)           |
| Shareholders' equity   | 13.210         | 16.447         | 19.642         | 23.183         | 26.398         | 30.279         |
| <b>Total equity</b>  | <b>13.166</b>  | <b>16.403</b>  | <b>19.598</b>  | <b>23.139</b>  | <b>26.354</b>  | <b>30.235</b>  |
| <b>Total sources of financing</b>                                  | <b>100.703</b> | <b>105.444</b> | <b>109.655</b> | <b>113.596</b> | <b>117.123</b> | <b>120.389</b> |

|   | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|---|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Forecast Income Statement</b>            |                |                |                |                |                |                |
| <b>Revenues</b>                             | <b>172.354</b> | <b>168.289</b> | <b>167.476</b> | <b>169.784</b> | <b>170.956</b> | <b>171.811</b> |
| Other income                                | 2.417          | 2.000          | 2.000          | 2.000          | 2.000          | 2.000          |
| Raw materials, consumables and goods        | (70.688)       | (67.734)       | (67.407)       | (68.336)       | (68.808)       | (69.152)       |
| Other operating costs                       | (10.738)       | (11.442)       | (11.369)       | (11.485)       | (11.564)       | (11.580)       |
| Operating cost (personnel and D&A excluded) | (44.289)       | (47.195)       | (46.893)       | (47.370)       | (47.697)       | (47.764)       |
| Personnel expenses                          | (28.849)       | (28.609)       | (27.634)       | (27.165)       | (27.353)       | (27.490)       |
| <b>EBITDA</b>                               | <b>20.207</b>  | <b>15.308</b>  | <b>16.173</b>  | <b>17.428</b>  | <b>17.534</b>  | <b>17.825</b>  |
| Depreciation                                | (1.953)        | (2.129)        | (2.635)        | (3.072)        | (3.396)        | (3.684)        |
| Amortization of operating intangibles       | (1.322)        | (1.441)        | (1.784)        | (2.079)        | (2.299)        | (2.493)        |
| <i>Total D&amp;A</i>                        | <i>(3.275)</i> | <i>(3.570)</i> | <i>(4.419)</i> | <i>(5.151)</i> | <i>(5.695)</i> | <i>(6.177)</i> |
| <b>EBITA</b>                                | <b>16.932</b>  | <b>11.738</b>  | <b>11.754</b>  | <b>12.277</b>  | <b>11.839</b>  | <b>11.648</b>  |
| Amortization of assets similar to goodwill  | (2.641)        | (2.500)        | (2.500)        | (2.500)        | (2.500)        | (1.364)        |
| <b>EBIT</b>                                 | <b>14.291</b>  | <b>9.238</b>   | <b>9.254</b>   | <b>9.777</b>   | <b>9.339</b>   | <b>10.285</b>  |
| Non-recurring and extraordinary items       | 133            | 0              | 0              | 0              | 0              | 0              |
| Interest income (expense) from investments  | (623)          | 0              | 0              | 0              | 0              | 0              |
| Exchange rate (losses) gains                | (1.548)        | 0              | 0              | 0              | 0              | 0              |
| Interest (expense) income                   | (5.386)        | (4.687)        | (4.760)        | (4.799)        | (4.819)        | (4.827)        |
| <i>Net financial result</i>                 | <i>(6.934)</i> | <i>(4.687)</i> | <i>(4.760)</i> | <i>(4.799)</i> | <i>(4.819)</i> | <i>(4.827)</i> |
| <b>EBT</b>                                  | <b>6.867</b>   | <b>4.551</b>   | <b>4.494</b>   | <b>4.978</b>   | <b>4.521</b>   | <b>5.457</b>   |
| Taxes                                       | (2.848)        | (1.365)        | (1.348)        | (1.493)        | (1.356)        | (1.637)        |
| <b>Group Net Income</b>                     | <b>4.019</b>   | <b>3.186</b>   | <b>3.146</b>   | <b>3.485</b>   | <b>3.164</b>   | <b>3.820</b>   |
| Minority result                             | 64             | 51             | 50             | 56             | 51             | 61             |
| <b>Net Income</b>                           | <b>4.083</b>   | <b>3.237</b>   | <b>3.196</b>   | <b>3.540</b>   | <b>3.215</b>   | <b>3.881</b>   |

|                           | 2015          | 2016          | 2017          | 2018          | 2019          | 2020          |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>NOPLAT Calculation</b> |               |               |               |               |               |               |
| <b>EBITA</b>              | <b>16.932</b> | <b>11.738</b> | <b>11.754</b> | <b>12.277</b> | <b>11.839</b> | <b>11.648</b> |
| Operating taxes           | (5.738)       | (3.439)       | (3.442)       | (3.598)       | (3.466)       | (3.393)       |
| <b>NOPLAT</b>             | <b>11.194</b> | <b>8.299</b>  | <b>8.312</b>  | <b>8.679</b>  | <b>8.373</b>  | <b>8.256</b>  |

|   | 2015           | 2016            | 2017            | 2018            | 2019            | 2020            |
|---|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>CASH FLOW STATEMENT Forecast</b>                           |                |                 |                 |                 |                 |                 |
| <b>NOPLAT</b>   | <b>11.194</b>  | <b>8.299</b>    | <b>8.312</b>    | <b>8.679</b>    | <b>8.373</b>    | <b>8.256</b>    |
| Amortization of operating intangibles                         | 1.322          | 1.441           | 1.784           | 2.079           | 2.299           | 2.493           |
| Depreciation  | 1.953          | 2.129           | 2.635           | 3.072           | 3.396           | 3.684           |
| <b>Gross cash flow</b>  | <b>14.469</b>  | <b>11.869</b>   | <b>12.730</b>   | <b>13.830</b>   | <b>14.068</b>   | <b>14.432</b>   |
| Change in operating working capital                           | (602)          | (764)           | (1.081)         | (2.253)         | (2.319)         | (2.217)         |
| Net capital expenditures                                      | (6.031)        | (10.097)        | (10.049)        | (9.338)         | (9.403)         | (8.591)         |
| Change in other operating assets and liabilities              | (2.327)        | 0               | 0               | 0               | 0               | 0               |
| <i>Gross investment</i>                                       | <i>(8.960)</i> | <i>(10.861)</i> | <i>(11.130)</i> | <i>(11.592)</i> | <i>(11.721)</i> | <i>(10.807)</i> |
| <b>Free cash flow before goodwill and similar intangibles</b> | <b>5.509</b>   | <b>1.008</b>    | <b>1.601</b>    | <b>2.238</b>    | <b>2.347</b>    | <b>3.625</b>    |
| Investments in goodwill and other intangibles                 | (2.035)        | 0               | 0               | 0               | 0               | 0               |
| <b>Free cash flow after goodwill and similar intangibles</b>  | <b>3.474</b>   | <b>1.008</b>    | <b>1.601</b>    | <b>2.238</b>    | <b>2.347</b>    | <b>3.625</b>    |
| Investments in non-operating assets                           | 12             | 49              | 0               | 0               | 0               | 0               |
| Non-recurring and extraordinary items                         | 133            | 0               | 0               | 0               | 0               | 0               |
| Interest income (expense) from investments                    | (623)          | 0               | 0               | 0               | 0               | 0               |
| Non-operating taxes   | 2.890          | 2.074           | 2.094           | 2.105           | 2.110           | 1.756           |
| <i>Non-operating cash flow</i>                                | <i>2.412</i>   | <i>2.123</i>    | <i>2.094</i>    | <i>2.105</i>    | <i>2.110</i>    | <i>1.756</i>    |
| <b>Cash available to investors</b>                            | <b>5.886</b>   | <b>3.131</b>    | <b>3.695</b>    | <b>4.343</b>    | <b>4.457</b>    | <b>5.381</b>    |
| Net financial result  | (6.934)        | (4.687)         | (4.760)         | (4.799)         | (4.819)         | (4.827)         |
| Change in debt equivalents                                    | 255            | (132)           | 0               | 0               | 0               | 0               |
| Change in minority interests                                  | (9)            | 51              | 50              | 56              | 51              | 61              |
| Change in shareholders' equity                                | 3.401          | 0               | 0               | 0               | 0               | 0               |
| <b>Decrease (increase) in net financial position</b>          | <b>2.599</b>   | <b>(1.637)</b>  | <b>(1.015)</b>  | <b>(401)</b>    | <b>(311)</b>    | <b>615</b>      |
| <b>Beginning net financial position</b>                       | <b>87.003</b>  | <b>84.405</b>   | <b>86.042</b>   | <b>87.057</b>   | <b>87.457</b>   | <b>87.769</b>   |
| <b>Ending net financial position</b>                          | <b>84.405</b>  | <b>86.042</b>   | <b>87.057</b>   | <b>87.457</b>   | <b>87.769</b>   | <b>87.154</b>   |

Appendix 4.4. - Unlevered beta calculation

| <b>Beta coefficient estimation</b> |              |              |              |                 |                   |              |            |
|------------------------------------|--------------|--------------|--------------|-----------------|-------------------|--------------|------------|
| <i>€/million</i>                   | MKT CAP      | NFP          | D/E          | $\beta$ Levered | $\beta$ Unlevered | $\beta$ debt | Rating     |
| De Longhi S.p.A.                   | 3.226        | (189)        | -5,9%        | 0,60            | 0,63              | 0,10         | A          |
| SEB                                | 6.005        | 316          | 5,3%         | 0,70            | 0,67              | 0,14         | BBB        |
| Leifheit AG                        | 257          | (68)         | -26,5%       | 0,60            | 0,78              | 0,10         | A          |
| Arcelik AS                         | 14.068       | 3.270        | 23,2%        | 1,00            | 0,86              | 0,28         | BB         |
| Midea Group Co Ltd                 | 25.328       | 9.228        | 36,4%        | 0,80            | 0,62              | 0,14         | BBB        |
| Newell Brands Inc.                 | 24.139       | 9.998        | 41,4%        | 1,20            | 0,89              | 0,14         | BBB        |
| Helen of Troy Ltd.                 | 2.377        | 620          | 26,1%        | 1,10            | 0,89              | 0,10         | A          |
| Mastrad SA                         | 5,81         | 3            | 59,0%        | 1,05            | 0,81              | 0,40         | B          |
| Gruppo Beghelli                    | 76           | 79           | 103,9%       | 1,30            | 1,05              | 0,80         | C-CCC      |
| Cembre SpA                         | 223          | 18           | 8,0%         | 0,45            | 0,44              | 0,28         | BB         |
| Biesse SpA                         | 354          | 1            | 0,1%         | 1,10            | 1,10              | 0,10         | A          |
| Sabaf SpA                          | 101          | 32           | 31,6%        | 0,46            | 0,45              | 0,40         | B          |
| Elica S.p.A                        | 119          | 53           | 44,5%        | 0,90            | 0,87              | 0,80         | A          |
| <b>Avg</b>                         | <b>5.868</b> | <b>1.797</b> | <b>26,7%</b> | <b>0,87</b>     | <b>0,77</b>       | <b>0,29</b>  | <b>BBB</b> |
| <b>Median</b>                      | <b>1.365</b> | <b>66</b>    | <b>26,4%</b> | <b>0,88</b>     | <b>0,79</b>       | <b>0,21</b>  | <b>BBB</b> |

*Appendix 4.5. – Interest coverage and rating class*

| EBIT/Int. Expense |          | Rating | Spread |
|-------------------|----------|--------|--------|
| From              | to       |        |        |
| 12,5              | 100000,0 | AAA    | 0,40%  |
| 7,5               | 9,5      | AA     | 0,70%  |
| 6,0               | 7,5      | A+     | 0,85%  |
| 5,0               | 6,0      | A      | 1,00%  |
| 4,5               | 5,0      | A-     | 1,30%  |
| 4,0               | 4,5      | BBB    | 2,50%  |
| 3,5               | 4,0      | BB+    | 3,00%  |
| 3,0               | 3,5      | BB     | 4,00%  |
| 2,5               | 3,0      | B+     | 5,50%  |
| 2,0               | 2,5      | B      | 6,50%  |
| 1,5               | 2,0      | B-     | 7,25%  |
| 1,3               | 1,5      | CCC    | 8,75%  |
| 0,8               | 1,3      | CC     | 9,50%  |
| 0,5               | 0,8      | C      | 10,50% |
| -1000,0           | 0,5      | D      | 12,00% |





## BIBLIOGRAPHY

ABUAF N., 2010. Valuing illiquid equity securities in light of the financial crisis of 2007-2009. *Journal of Applied Finance*, 20 (1), 110-126.

AFFLERBACH S., 2014. *Master thesis on the valuation of distressed firms: a conceptual framework and a case application*. Copenhagen Business School.

ALDRIGHETTI F., ERZEGOVI, 2008. *Il piano finanziario e valutazione d'azienda in ipotesi di continuità operativa e di liquidazione*. Università di Trento.

ALDRIGHETTI F., SAVARIS R., 2008. *La riforma delle procedure concorsuali e i modelli di gestione dell'impresa in crisi*. Progetto Smefin.

ALLEN F., BREALEY R., MYERS S., 2006. *Principles of corporate finance*. Boston McGraw-Hill/Irwin.

ALMEIDA H., PHILIPPON T., 2007. The risk-adjusted cost of financial distress. *Journal of Finance*, 62, 2557-2586.

ALTMAN E.I., HALDEMAN R., NARAYANAN P., 1977. ZETA analysis: a new model to identify bankruptcy risk of corporations. *Journal of Banking and Finance*, 1, 29-54.

ALTMAN E. I., 1984. A further empirical investigation of the bankruptcy cost question. *Journal of Finance*, 39, 1067-1085.

ALTMAN E.I., DAVONI A., FALINI A., 2013. La previsione dell'insolvenza: l'applicazione dello Z Score alle imprese in amministrazione straordinaria. *Bancaria*, 4, 24-37.

ANDRADE G., KAPLAN S.N., 1998. How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. *Journal of Finance*, 53, 1443-1493.

ARZAC E. R., 1996. Valuation of highly leveraged firms. *Financial Analysts Journal*, 52 (4), 42-50.

ARZAC E. R., 2008. *Valuation for mergers, buyouts and restructuring*. New York, John Wiley & Sons Inc.

BARATH S. T., SHUMWAY T., 2004. *Forecasting default with kmv-merton model*. Master's thesis, University of Michigan

- BINI M., et al., 2013. *Analisi di bilancio, Parte II. Tools*.
- BLACK F., SCHOLLES M., 1973. The pricing of options and corporate liabilities. *Journal of Political Economy* 81(3), 673-653
- BORSA ITALIANA, 2004. *Guida alla valutazione*.
- BROWN D.T., JAMES C.M., MOORADIAN R. M., 1994. Asset sales by financially distressed firms. *Journal of Finance* 1, 233-257.
- BUTTIGNON F., 2008. Il governo delle crisi d'impresa in Italia alla luce del nuovo quadro normativo: una riflessione introduttiva. *Rivista dei dottori commercialisti*, 2, 243-281.
- BUTTIGNON F., 2012. *Corporate crisis and turnaround. Debt Restructuring*. Slides of the course "Advanced Corporate Finance and M&A". Facoltà di Economia, Padova.
- BUTTIGNON F., 2014. *Distressed firm valuation: reorganization plan and going-concern capital value*. Facoltà di Economia, Padova.
- CAMPBELL, JOHN Y., HILSCHER J. D., SZILAGYI J., 2011. Predicting financial distress and the performance of distressed stocks. *Journal of Investment Management*, 9 (2), 14-34.
- CERVED GROUP, 2013. *Il boom di domande in bianco spinge i concordati*. Osservatorio su fallimenti, procedure e chiusure di imprese.
- COOPER I. A., DAYYDENKO S. A., 2007. Estimating the cost of risky debt. *Journal of Applied Corporate Finance*, 19 (3).
- COPELAND T., ANTIKAROV V., 2001. *Real options, a practitioner's guide*. Monitor Group.
- CROSBIE P., BOHN J., 2003. *Modeling default risk: modeling methodology*. Moody's KMV Company.
- CRYSTAL M., MOKAL R. J., 2006. The valuation of distressed companies- A conceptual framework. *International Corporate Rescue*, 3 (2,3).
- DAMODARAN A., 2000. *The dark side of valuation: firms with no earnings, no history and no comparables*. Stern School of Business, New York.
- DAMODARAN A., 2002. *Valutazione delle aziende*. Apogeo Editore, Milano.
- DAMODARAN A., 2005. *La stima del premio per il rischio*. Stern School of Business, New York.
- DAMODARAN A., 2006. *Finanza aziendale*. Apogeo Editore.

- DAMODARAN A., 2006. *The Cost of distress: survival, truncation risk and valuation*. Stern School of Business, New York.
- DAMODARAN A., 2009. *Valuing distress and declining companies*. Stern School of Business, New York.
- DAMODARAN A., 2011. *The dark side of valuation: valuing young, distressed, and Complex Business*. Pearson Education.
- DASTGIR M., KHODADADI V., GHAYED M., 2010. Cash flows valuation using capital cash flow method comparing it with free cash flow method and adjusted present value method in companies listed on Tehran stock exchange. *Business Intelligence Journal*, 3 (2), 45-58.
- DESSAY A., 2007. La determinazione del terminal value nelle valutazioni finanziarie: soluzioni e problemi. *La valutazione delle aziende*, 47, 15-22.
- DORIGATO, ALDRIGHETTI F., 2009. *Gestione della crisi e valutazione d'azienda in ipotesi di risanamento e liquidazione*. Facoltà di Economia, Trento.
- DAVYDENKO S.A., STREBULAEVI.A., ZHAO X., 2012. A market-based study of the cost of default. *The Review of Financial Study*.
- DWYER D., KOCAGIL A. STEIN R., 2004. *The Moody's KMV EDF™ RISKCALC™ v3.1 model next generation technology or predictive private firm credit default risk*. Moody's KMV Company.
- FALINI A., 2011. *La crisi d'impresa e le sue cause: un modello interpretativo*. Università degli Studi di Brescia, Paper n. 125.
- FAZZINI M., 2009. *Analisi di bilancio. Metodi e strumenti per l'interpretazione delle dinamiche aziendali*. Milano, Ipsoa.
- FERNANDEZ P, AGUIRREAMALLOA J., AVENDAÑO L.C., 2013. *Market risk premium used in 82 countries in 2012: a survey with 7,192 answers*. IESE Business School.
- GIANNI F., 2010. *Il processo di restructuring: aspetti finanziari e industriali. Il piano di risanamento ex art. 67 legge fallimentare*. Gianni, Origoni, Grippo & Partners.
- GILSON S.C., RUBACK A.S., HOTCHKISS E.S., 2000. Valuation of bankrupt firms. *The Review of Financial Studies*, 13 (1), 43-74.
- GIRALDI S, GAGLIARDI G., 2007. La valutazione di una PMI con il metodo "Unlevered Discounted Cash Flow". *Amministrazione e Finanza*, 9, 49-59.

- GOTTARDO P., 2006. *La gestione dei rischi nelle imprese industriali e finanziarie*. Giuffrè Editore.
- GUATRI L., 1995. *Turnaround: declino, crisi e ritorno al valore*. EGEA, Milano.
- GUGLIELMUCCI L., 2011. *Diritto fallimentare*. Giappichelli Editore, Torino.
- HILL N.T., PERRY S.E., ANDES S., 1996. Evaluating firm in financial distress: an event history analysis. *Journal of Applied Business Research*, 12 (3), 60-71.
- HOULIHAN LOKEY, 2011. *Let knowledge and experience navigate, buying and selling the troubled company*.
- IGNATOV A., 2006. *Valuation of distress company*.
- JENNERGREN L. P., 2013. "Firm Valuation with Bankruptcy Risk." *Journal of Business Valuation and Economic Loss Analysis* 8(1): 91–131.
- JENSEN M.C. AND MECKLING W.H., 1976. Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- KOLLER T., GOEDHART M., WESSELS D., 2010. *Valuation: measuring and managing the value of the companies*. McKinsey & Company.
- KORTEWEG A, 2007. *The costs of financial distress across Industries*. Working paper.
- KOSE J., 1993. Managing financial distress and valuing distressed securities: a survey and research agenda. *Financial Management*, 22 (3), 60-78.
- MAZZOLENI A., GIACOSA E., 2011. *Il processo di risanamento dell'impresa in crisi: la recente esperienza italiana*. Università degli Studi di Brescia, Paper n.116.
- MEITNER M., STREITFERDT F.G., 2014. "DCF-Valuations of Companies in Crisis: Distress-Related Leverage, Identification of Risk Positions, Discounting Techniques, and 'Beta Flips'." *Journal of Business Valuation and Economic Loss Analysis* 9(1): 145–174.
- MENGHINI F., 2005. *I covenant di bilancio nei finanziamenti a medio lungo termine: aspetti introduttivi, best practice e spunti metodologici*. Bancaria Editrice, Roma.
- MERTON R.C., 1973. "Theory of Rational Option Pricing." *Bell Journal of Economics and Management* 4(1): 141-183.
- MERTON, R.C. 1977. "On the Pricing of Contingent Claims and the Modigliani-Miller Theorem." *Journal of Financial Economics* 5(2): 241-249.

- MODIGLIANI F., MILLER M.H., 1958. The cost of capital, corporation finance, and the theory of investment. *American Economic Review*, 48, 261-297.
- MONTELLA S., STAIANO C., 2012. La valutazione della continuità aziendale nella crisi d'impresa. *Economia Aziendale Online, Business and Management Sciences International Quarterly Review*, 3, 419-427.
- MYERS S.C., 1977. Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147-175.
- NAPODANO G., et AL., *La crisi d'impresa: l'attestazione di ragionevolezza dei piani di ristrutturazione ex art. 67, 3° comma, lettera d) L.F.*. I Quaderni di Commissione Gestione Crisi d'Impresa e Procedure Concorsuali, 27, Ordine dei Dottori Commercialisti e degli Esperti Contabili, Milano.
- OHLSON J.A., 1980. Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 18, 109-130.
- PEDERSEN M. E. H., 2014. *Monte Carlo simulation in financial valuation*. [www.hvass-labs.org](http://www.hvass-labs.org)
- PENCARELLI T., 2013. *Le crisi d'impresa. Diagnosi, previsione e procedure di risanamento*. Franco Angeli Editore.
- POTERBA J. M., SUMMERS L. H., 1995. A CEO survey of U.S. Companies' Time horizons and hurdle rates. *MIT Sloan Management Review* 37 , 43-53.
- RESTI A., SIRONI A., 2008. *Rischio e valore nelle banche*. Egea Editore, Seconda edizione.
- RUBACK R.S., 2000. *Capital Cash Flow: a simple approach to valuing risky cash Flows*. Working paper, Harvard Business School.
- RUBACK R.S 2011. Downsides and DCF: valuing biased cash flow forecast. *Journal of Applied Corporate Finance*, 23 (2), 8-18.
- SCHMIDT F., 2009. The undervaluation of distressed company's equity. *Munich Personal RePEc Archive*, 13377.
- SCHUELER A., *Valuation of companies in financial troubles: the case of Eurotunnel*. Houlihan Lokey.
- SHAFFER S., 2006. "Corporate Failure and Equity Valuation." *Financial Analysis Journal* 62(1): 71-80.

UHRIG-HOMBURG M., 2002. "Valuation of Defaultable Claims – A Survey." *Schmalenbach Business Review* 54(January): 24–57.

WARNER J. B., 1977. Bankruptcy costs: some evidence. *Journal of Finance*, 32, 337-347.

WEISS LAWRENCE A., 1990. Bankruptcy resolution: direct costs and violation of priority of claims. *Journal of Financial Economics*, 27, 285-314.

## **SITOGRAPHY**

[www.borsaitaliana.it](http://www.borsaitaliana.it)

[aswathdamodaran.blogspot.it](http://aswathdamodaran.blogspot.it)

[pages.stern.nyu.edu/~adamodar](http://pages.stern.nyu.edu/~adamodar)

[www.ilsole24ore.it](http://www.ilsole24ore.it)

[www.bloomberg.com](http://www.bloomberg.com)

[www.yahoo.finance.it](http://www.yahoo.finance.it)

[www.milanofinanza.it](http://www.milanofinanza.it)

[www.consob.it](http://www.consob.it)

[www.bialettigroup.it](http://www.bialettigroup.it)

[www.delonghigroup.com](http://www.delonghigroup.com)

[it.reuters.com](http://it.reuters.com)

[www.4-traders.com](http://www.4-traders.com)