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"THE VALUATION OF COMPANIES IN DISTRESS: THE CASE STUDY OF STEFANEL"

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To my mother, my father, my brother, and all the people who love me:

your support has inspired and encouraged me to achieve this important goal.

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Abstract

The purpose of this study is to review the literature concerning the concept of corporate distress and the related topic of distressed firm valuation. Accordingly, the definition of what a company in distress is and entails, the underlying causes, the tools to prevent and detect as well as to tackle distress are illustrated. In this respect, the valuation of distressed companies results to be a critical subject, since the economic value of the firm is the basis on which decisions about the distressed firm's future are based. Thus, the main corporate valuation methods are exhibited in relation to the pros and cons that they present when applied to a context of economic and financial distress: asset approaches and option-pricing models best serve the aim of providing the firm value upon liquidation, while unlevered methods (APV and CCF) appear the most suitable to value the distressed firm under the going-concern assumption. Finally, the valuation of an Italian listed company currently facing a situation of distress is provided in detail.

L'obiettivo del presente lavoro è quello di esaminare e rivisitare in maniera critica la letteratura concernente il concetto di crisi aziendale e il relativo tema della valutazione delle aziende in dissesto. Quindi, viene specificato cosa significa e implica il termine "crisi", le relative cause, i modi per prevenire e identificare così come risolvere la crisi. A riguardo, risulta critica la valutazione economica di tali aziende, poiché è dalla valutazione dell'azienda in crisi che si decide il futuro della stessa. Vengono così presentati i più conosciuti modelli di valutazione aziendale in relazione ai relativi vantaggi e svantaggi che essi presentano quando utilizzati su aziende in squilibrio economico e finanziario: i metodi patrimoniali e di Option Pricing si prestano meglio a fornire una valutazione economica dell'azienda in caso di liquidazione, mentre i modelli unlevered (APV e CCF) appaiono più idonei a valutare l'azienda in ipotesi di continuità. Viene infine illustrata nei dettagli la valutazione di un'azienda italiana quotata che sta attraversando una conclamata fase di crisi.

Introduction

The last years have been characterized by one of the major financial and economic crisis of the recent history: some banks and financial institutions have filed for bankruptcy while many others have been close to it; big corporations have been obliged to cut costs to counteract the crunch in orders and revenues, while many small and medium enterprises have gone out of business; thousands of people all around the world have lost their job as well as their house. In this period of economic stagnation the attention towards companies in distress have been relevant: in fact, from both an economic and social perspective, not only does the failure of a company imply relevant costs to the corporation's shareholders, creditors and employees, but also to the related community. And the larger the company in trouble, the worse the consequences: that is why there have seen several big private companies being saved from bankruptcy by governments, with small-medium enterprises (SMEs) paying the highest price for this economic downturn. Even nowadays there are many companies experiencing difficulties as well as companies in a serious condition of crisis. But what are the distinctive characteristics of a company in distress? This will be the topic discussed in the first chapter of this dissertation: in fact, some of the numerous responses produced so far by the literature will be presented in paragraph 1.2, and this will be performed in a way that makes possible the consideration and comparison of all the main ideas concerning this argument, with the ultimate aim of delineating the most agreed features defining distress. The typical path to the crisis will also be defined. Then, the various possible causes leading to this state will be presented and discussed in paragraph 1.3. Central to the distress subject is the restoration of a normal condition for the firm, because usually is this what every distressed company aspires to: thus, in paragraph 1.4 some frameworks for the analysis of the firm's internal and external environment are discussed, as well as a series of easily computable accounting ratios that can be used for detecting potential or well-established problems is provided. In addition, some of the first and most relevant default prediction models will be introduced, given their current variety and widespread utilization. The discussion will then focus (paragraph 1.5) on the general problems which affect distressed firm's stakeholders when they try to cope with distress. Subsequently, some tools that managers and entrepreneurs have at their disposal to deal with crisis along its progressive development are presented, as well as

how the law has been designated to protect the interests of the various stakeholders involved (paragraph 1.6): in particular, the available out-of-court and in-court procedures are illustrated, and their main requisites, aim and consequences explained. There will be also a review of the latest legislative modifications, such as the Agreement with Firm's Going Concern ("Concordato con Continuità Aziendale"). Finally, the costs of distress as well as the studies of previous practitioners who have tried to quantify these costs will be discussed in paragraph 1.7; furthermore, also the potential benefits of distress, which are commonly overlooked, will be presented.

The fact that a company in distress usually has both a high financial burden as well as problems with its business model and profitability gives to the valuation of this type of companies the role of being the basis point upon which to take future decisions: in fact, in practice it is usually evaluated whether it is more convenient (profitable), from a purely economic perspective, to make the company file for bankruptcy or to let it continue its operations as a going-concern entity. And, in a distress condition, this is a choice that pertains to company's creditors, because they are the parties to which the firm owes most, thus the ones assuming the greater part of the company's risk. Thus, the second chapter will open with an illustration of the facts and particularities of corporate valuation in a context of distress (paragraph 2.2). Then, the attention will turn to the exploration of the most common valuation methods, in particular the pros and cons of each one analyzed in relation to its application to cases of firms in distress, and the practical problems that make a technique more or less suitable for different valuation purposes. In greater detail, the asset approaches (paragraph 2.3) and option-pricing models (paragraph 2.4) are illustrated for their importance in the calculation of equity value of a distressed firm upon liquidation. Successively, the techniques suitable for valuing a distressed firm under the assumption of going-concern are discussed. Firstly, the income approaches, and in details the Discounted Cash Flow (DCF), Adjusted Present Value (APV), and Capital Cash Flow (CCF) methods, will be the focus of paragraph 2.5; in addition, in the same paragraph the process which makes use of Monte Carlo simulations to deal with uncertainty will be discussed. Secondly, the market approaches that is, the relative valuation models based on comparable firms and comparable market transactions, will be the cornerstones of paragraph 2.6.

In the third chapter it will be presented a practical case of an Italian listed company that is experiencing a rooted distress condition: Stefanel S.p.A. Stefanel is one of the Italian "historic" brands in the fashion and apparel industry but, in combination with the rise of the economic crisis in 2007-2008, have revealed some operational and strategic problems. To make matters worse, no concrete and effective solutions have been found by the Group's management and the operational difficulties have inevitably triggered serious financial problems: in 2011 the company was obliged to ask for help through an out-of-court procedure, the so-called Agreements on Debts Restructuring ("Accordi di Ristrutturazione dei Debiti"), according to which the creditors granted the company the financial aid necessary to continue its operations. In line with the contents of the first and second chapters of this dissertation, a comprehensive analysis of the Stefanel Group's structure, strategy and business model will be presented in paragraph 3.2; then, there will be a presentation and discussion of the Group historical results (paragraph 3.3). The examination will continue with an in-depth analysis of the apparel and fashion industry in which Stefanel operates (paragraph 3.4). Finally, the Group's path to the crisis from its early stages will be presented and judged in paragraph 3.5, also in consideration of what have been the responses of management to occurring problems: thus all the main causes of Stefanel's financial distress will be pointed out.

The exhaustive analysis performed in the third chapter has served as the basis for the projection of Stefanel's data into the future. In fact, in the forth chapter a stepwise valuation of the Group through a modified version of the well-known Adjusted Present Value method will be provided. Firstly, the latest available news about Stefanel as well as other premises regarding the valuation procedure will be illustrated in paragraph 4.2. The valuation method which has been adopted will instead be briefly presented in paragraph 4.3. In particular, the valuation model is based on three different possible future scenarios, where each one entails different future developments with respect to the effect of implemented key strategic actions: the main underlying assumptions will be exposed and explained in paragraph 4.4. Thus, it will be computed the value of operations in the explicit period of projection (paragraph 4.5) and in perpetuity (paragraph 4.6), the side effects of financing and tax loss carry-forwards (paragraph 4.7), and the related distress/bankruptcy costs (paragraph 4.8): from these figures the EV, the market value of debt and equity will be derived (paragraph 4.9). The chapter

will conclude with the presentation of the expected final values of Stefanel's assets, debts and equity (paragraph 4.10) coupled with a related sensitivity analysis.

Finally, in chapter five all main arguments and conclusions derived in this dissertation will be summarized as well as the valuation results interpreted: Stefanel's share value will prove meaningful of the main concerns highlighted throughout the Group analysis.

1 Company in distress

1.1 Introduction

This first chapter will focus on defining what a distressed company is and what implies for all the stakeholders involved, in an overall attempt to make more understandable a topic which has been hardly debated because of its complexity and the several different shades that can assume. What must be clear is that the firm, as described also by Liberatore et al. (2014), is a complex object immersed in another complicated and uncertain object, the environment: it follows that each company has its own peculiarities and faces several threats to different degrees, thus both the firm's internal and external environment must be deeply analyzed and understood in order to prevent and/or resolve distress. And this investigation provides the basis for the valuation of such type of companies as well as it assists stakeholders (in particular debt holders) in taking responsible decisions about distressed companies' near future.

In greater detail, in paragraph 1.2 the literature on the distress concept is presented, with the final result of obtaining a division of the distress notion into two different but connected ideas: economic and financial distress. In addition, the typical path to the crisis is described, with the crisis in its strict meaning being usually preceded by a declining phase: the latter is quite a common stage in every firm's life-cycle, with successful companies being able to tackle the decline with some major changes, usually strategic and operational ones. In paragraph 1.3 the main causes of distress are classified into macro classes and investigated individually: in particular, the sources of concern can be internal or external to the firm, though the literature have recently agreed that it is usually the combination of both components that makes the firm fall into distress. Paragraph 1.4 will instead analyze the classic distress manifestations: the focus is on providing frameworks for anticipating and/or understanding a crisis as well as on illustrating and explaining a series of accounting ratios that can reveal particular firm's internal imbalances. Furthermore, some examples of the earliest and most famous default prediction models are provided. Paragraph 1.5 instead concentrates on the general problems commonly faced when dealing with distress – such as the timing of counteracting interventions, governance related issues, uncertainty, information asymmetry and conflicts of interest – especially when trying to reach an agreement for

the firm's turnover. In particular, it is paragraph 1.6 that illustrates all Italian legal tools designed to resolve distress with credit holders, with each legal instrument consisting of different requisites and rules and implying a different way to deal with distress. Lastly, paragraph 1.7 will concentrate on giving some insights about the costs that distress can bring about, which are regarded as direct and indirect. Firms are particularly concerned with these potential costs but, from an overall perspective, distress is not solely a negative point in a firm's life-cycle: in fact, distress represents also an opportunity, a moment where entrepreneurs and the management can and have to take drastic decisions which imply choices and risks that would not have been taken if the firm were not in crisis.

1.2   Concept

The terms "crisis" or "distress" are used by economists and researchers in a broad sense to describe a firm that is experiencing some sorts of strong and alarming tension. In practice, in the day-by-day workplaces and legal offices, entrepreneurs and lawyers generally use these words to describe a firm that is near to bankruptcy. However, the crisis is a state that ranges from a low and completely resolvable level to a severe and irrecoverable one, which corresponds to bankruptcy. You may think at distress as a complex situation that can develop both in a quick way, for example following certain very inappropriate decisions of the company's top management, and also as the final result of a series of interrelated problems that take place in a long period of time. What must be clear is that, even the worst crisis may come from problems or inefficiencies that initially may not seem alarming or are simply hidden. Thus, we can easily understand why a proper form of corporate governance, as well as a properly defined system of internal control, can really make the difference in identifying potential problems as soon as possible before they can cause serious damages to the firm.

Turning back to the identification of what a firm in distress conceptually means, going through the literature that has been developed until now, we have found how the attention of lecturers and practitioners has focused on different aspects when defining and dealing with "distress". In fact, the term is nowadays widely used because it is actually interpreted in many different ways, and here is the point: make a clear

distinction on what actually means "be in distress". From the beginning of the studies on this field it has appeared that the boundary defining what is a healthy firm and a distressed one was faded. The ex-post definition of distressed firm that is, one which is declared insolvent by a court, is not universally applicable since it depends in a great extent on the legal system of each country and on the legal instruments stakeholders can use.

As also highlighted by Sirleo (2009), the literature had not provided a clear definition of the term "distress" until the most recent years, caring more about examining the components, causes, consequences and counteractive actions that could be adopted to overturn the distress situation. Zanda et al. (1994) speaking about companies operating under economic imbalances, defined a "firm at loss" as one which is not able to adequately reward the factors which contribute to the business management. The researchers continued considering the studies of Pinardi (1985), who described as "at loss" those commercial entities which are not able to produce income statements with positive margins, firms unable to properly repay the cost of capital they have employed. These are what we could define "soft" definitions of distress, since they only highlight the fact that the firm have profitability problems that is, the firm is unable to generate enough profit to pay back creditors and shareholders for the capital they have provided to run the business operations; here, in fact, there are no allegations to the financial situation of the company, e.g. at the liquidity condition or at the level of leverage employed by the firm. Moving ahead in time, Guatri (1986) firstly identified a series of fixed elements which characterize a company in distress: the presence of inefficiencies, lack of planning, products no more able to encounter the consumers' demand, financial imbalances, structural rigidities, overcapacity. Guatri (1995) then described the crisis condition as the result of four interrelated stages, with the distress state being usually anticipated by a so-called period of decline. In the decline period the first signals of imbalances and problems appear, while the real crisis is a further degeneration where the imbalances transform into remarkable instabilities. Also Sirleo (2009) highlighted how the distress situation represents an additional step with respect to the simple state of decline, with this distinction being not so clear in practice. What he stated is that the decline phase is physiological in a firm lifecycle where continuous moments of decline and restructuring actions alternate. Aldrighetti e Savaris (2008) described the state of

crisis as a process characterized by deteriorating conditions of the firm's operational balance, which in turn lead to the progressive alteration of the economic and financial situations, as well as to balance sheet imbalances. A more "strict" definition is the one proposed by Wachtell et al. (2013): distress is the condition in which a company has difficulties in dealing with its liabilities, whether in making payments when due, receiving or settling trade receivables, fixing violations of debt covenants, or obtaining new funds to resolve liquidity needs. This is a description that is very close to the insolvency concept, since it represents a more advanced stage of the entire path to the crisis, when the firm has no more liquidity and is no longer able to find alternative sources of funds to pay back its creditors. A more general definition was proposed by Damodaran (1994, p.180) who affirmed that "A firm in financial distress has some or all of the following characteristics: negative earnings and cash flows, an inability to meet debt payments, no dividends, and high debt/equity ratios". Instead, Senbet and Wang (2012) made a clear distinction between economic distress and financial distress. They classified as firms in financial distress those that are unable to respect the obligations they have towards their creditors: thus, financial distress is clearly linked to the leverage strategy adopted by firms. On the contrary, economic distress has nothing in common with leverage, but it is the result of operational problems. It follows that a firm in financial distress may have or have not operational problems, as well as a firm in economic distress may be or not in financial distress. The two concepts are usually linked, as economic distress generally triggers financial distress, but not in a perfectly correlated way. In fact, Senbet and Wang (2012, p. 7) specify that "On the one hand, a financially distressed firm may have a viable operation of real assets and thus not be economically distressed. On the other hand, an all-equity firm can be economically distressed, but can never be financially distressed because there are no creditors". Also Crystal and Mokal (2006) distinguished between economic and financial distress, stating that the latter means that the firm has not enough liquidity to pay back its debt obligations when due. On same line Eckbo (2008) affirmed that financial distress occurs when a company has not enough liquid assets to meet the requirements coming from the liabilities incurred with those stakeholders different from shareholders, for example creditors, suppliers and employees.

The logical question at this point is: what kind of distress we have to consider to define a company in distress? To answer this question we will treat each case in turn. Firstly, consider a firm that has a strong financial structure that is, one with a low debt/equity ratio, but that at the same time is facing profitability problems (it is in economic distress): its solid financial structure will grant the firm a period of time to settle its operational problems and return to profitability, because the losses can be covered through the use of equity. However, if the firm is not able to fix the causes of economic distress in the medium-long term, economic distress will lead to the erosion of equity capital, thus to a condition of financial distress and eventually to bankruptcy. Secondly, consider a firm that is not in economic distress that is, it is showing positive margins and earning profits, but that has a very high debt/equity ratio: if the company is able to survive in the short-term by using net profits to reduce the debt exposure, it will eventually be able to come out of the situation of financial distress and thus survive; on the contrary, if future cash-flows are not enough to pay back creditors, the condition of financial distress can threaten the going-concern of the entity. Thus, we can infer that between economic and financial distress usually it is the latter that threatens more the going-concern, the existence of a firm, because potentially capable of bringing the firm quickly to bankruptcy. However, if the solution to the operational problems is not found, also economic distress alone may in turn lead to financial distress, which can eventually result in bankruptcy. Thus, it appears that financial distress alone is more troubling, but that it is usually the combination of both economic and financial distress that brings the company in real trouble that is, near or to bankruptcy. Eckbo (2008, p.245) himself declares that "It is often not only financial distress … but also economic distress that leaves the firm unable to pay its debts". In practice, a financial crisis is often caused by an operational crisis, meaning that the company firstly experiences problems with its profitability that then lead to financial troubles. Davydenko et al. (2012) followed the same line of thinking distinguishing between financial distress, defined as the inability to meet required debt payments, and economic distress, a worsening of economic fundamentals. In addition, they stated that financial distress typically occurs simultaneously with economic distress. Pindado et al. (2008) used a more "practical" definition of distress following an ex-ante approach. According to

them, a company is financially distressed when it meets both of the following two conditions:

- The EBITDA is lower than the financial expenses for two consecutive years;

- The firm's market value falls between two consecutive years.

The first condition means that the firm is not able to generate enough cash from its operational activities to meet its financial obligations, which in turn lead the market to evaluate it negatively finally causing a fall in the firm's market value. According to their theory, a company is financially distressed in the year following the occurrence of the two previously described events. Thus, also in this study it is recognized the importance of economic distress when dealing with and defining "distress": in fact, with this theory Pindado et al. (2008) underlined that economic distress is one of the causes of financial distress, but they also went further declaring that the consequences of financial distress will be suffered by the firm until it improves its economic condition and this is finally recognized by the market. Also the studies of Wruck (1990) highlighted that companies fall into financial distress because of economic distress, declining performances and inadequate management.

However, facing some profitability problems is quite a common fact in the life cycle of every type of company, whichever the industry in which it operates. In fact, as it is the case of every product or good, firms are subject to a life cycle: thus, for most of them, there is a beginning but also an end. This is because firms have to compete in a continuously changing environment where to each player's initiative corresponds a reaction of the other players in the market. The concept is illustrated in figure 1.1 below.

Figure 1.1 - The business life cycle

Life Cycle & Pricing Metrics

	The Idea	The Product/Service	The Business Model	The Harvest	End Game
Key Questions	Is there a market for the product or service? How big is that market? Will you survive?	Do people use your product or service? How much do they like it?	Will people pay for the product or service? Can you scale up, i.e., grow as you get bigger?	Can you make money of the product and service and sustain profitability in the face of competition?	What will you get if you sell your assets? How do you plan to return cash flows to your investors?
Pricing Metrics & Measures	Market size, Cash on hand, Access to capital	Number of users, User intensity (EV/User)	User engagement with model, Revenues (EV/Sales)	Earnings levels and growth (PE, EV/EBIT)	Cash flows, Payout & Debt servicing (PBV, EV/EBITDA)
Narrative vs Numbers	Mostly or all narrative	More narrative than numbers	Mix of narrative & numbers	More numbers than narrative	Mostly or all numbers
Value Drivers	Total market size, Market Share & Target Margin	Revenue Growth (and its drivers)	Revenue Growth & Reinvestment	Operating margins and Return on capital	Dividends/Cash Returns & Debt ratios
Dangers	*Macro delusions*, where companies are collectively overpriced, given market size.	*Value distractions*, with focus on wrong revenue drivers.	*Growth illusions*, with failure to factor in the cost of growth.	*Disruption Denial*, with failure to see threats to sustainable profits.	*Liquidation leakage*, with unrealistic assumptions about what others will pay for liquidated assets.
Transitions	*Potential to Product*	*Product to Revenues*	*Revenues to Profits*	*Profits to Cash flows*	

Source: http://aswathdamodaran.blogspot.it/2014/11/twitter-bar-mitzvah-is-social-media.html

In fact, every firm begins as a start-up and then, if the idea at the basis of the business is economically sound and the firm's business model has been ideated and implemented properly, then a rapid expansion takes place. Subsequently, a "high growth" and a "mature growth stage" usually follow. Then, a last stage called "decline" usually occurs: revenues and operating income decrease, and the company stops growing. Every firm may pass through this last stage, but only those that are able to recognize the sources of the drop of revenues and operating margins and cope with them will come out of this critical period and get back to growth. When the "decline" stage takes place, the company either is capable of renewing itself or it is condemned to fall into bankruptcy.

Luerti (1992) pointed out that the state of distress goes through a path consisting of three phases:

- Economic phase: characterized by non-profitability/inefficiency, with cash flow generation that is not sufficient to comply with the firm's investment necessities;

- Financial phase: when the company is unable to get back to a positive level of profitability, and creditors, shareholders, customers and suppliers that do not support the firm anymore leading it to default;

- Legal phase: takes place when the company files for bankruptcy or asks for other legal procedures prescribed by the law to deal with the distress state.

This is a progressive, gradual journey that the firm might undertake. The economic phase is the first stage, and if the top management is able to make the firm returns to profitability and thus to cash generation instead of cash erosion, the crisis is early solved before it might have taken a more serious direction. However, this is the case of only those firms that have implemented, as we have said before, a well defined governance structure and system of internal control, one where also bottom-up contributions are considered and also the employees at the lower levels are able to effectively communicate problems to those in power. If the problems that had caused the Economic phase are not resolved, the company goes through the Financial phase, a phase where it is unable to find a solution to recoup its profitability and where stakeholders finally prefer to find a legal solution to deal with the evident distress; in this way the crisis is at its Legal phase, where an in-court or an out-court resolution is agreed by the parties.

A more detailed path that brings the firm into distress was given by the contribution of Liberatore et al. (2014), a path actually based on the previous work of Guatri (1995) and which is constituted by four stages:

Figure 1.2 - The four stages of crisis development and its manifestations
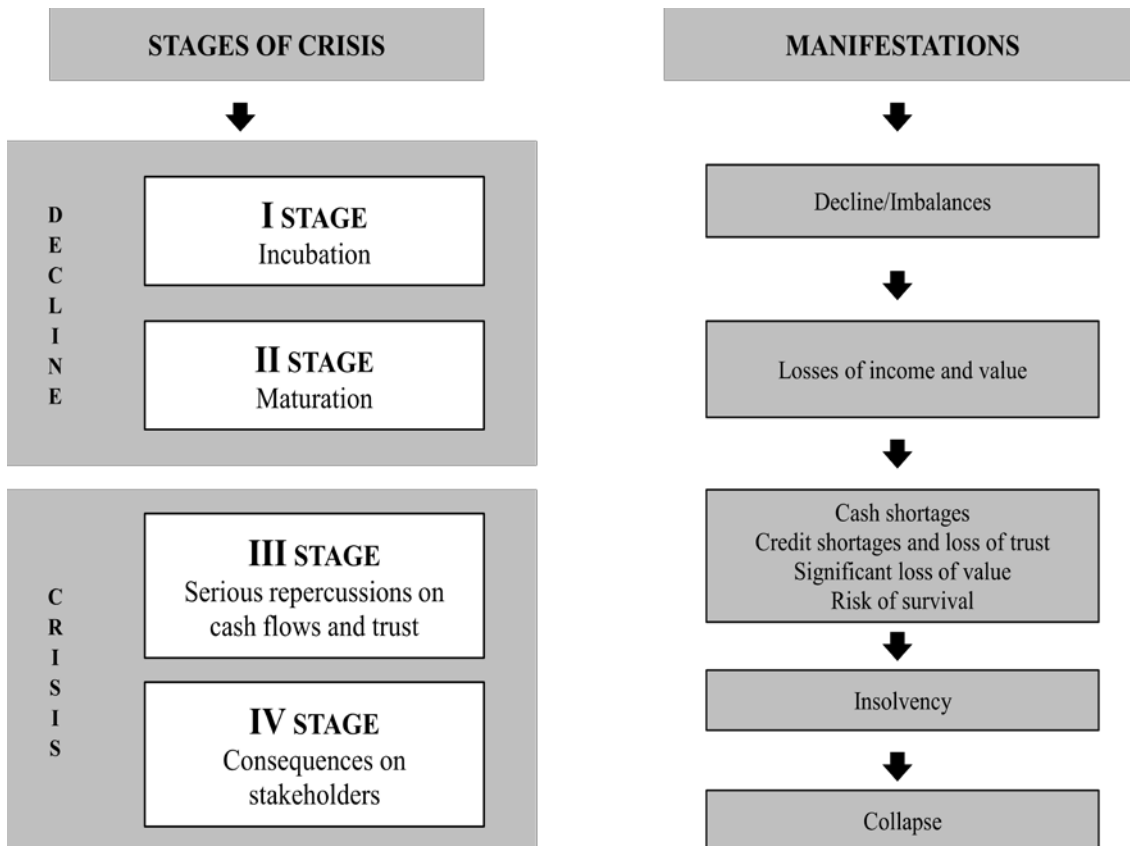
– Incubation: the company's revenues struggle, inventory increases, the firm is unable to cope with the financial requirements. This is a premature phase of the crisis, thus if the causes of these problems are identified and promptly resolved by the top management, the firm can easily return to its normal situation.

– Maturation: the initial decline in revenues finally ends up in net losses, which will eventually lead to the erosion of firm's resources. In fact, losses are usually covered by the use of firm's excess cash (that in turn lead to a state of illiquidity), or by resources that were previously allocated to other company's functions, or by share capital and/or equity reserves.

– Repercussions on cash flows and trust: this phase corresponds to insolvency, implying firm's inability to make the payments when due. This situation may be considered temporary if there is enough equity to compensate for this shortage

of liquidity and if positive future economic perspectives exists; otherwise, if the situation is not recoverable, insolvency is definitive.

− Consequences on stakeholders: the crisis spreads also outside the firms, entailing a loss of reputation as well as of credibility with respect to the different stakeholders, the loss of customers and the collapse of the financial structure.

The first two stages that is, Incubation and Maturation, constitute a declining situation of the company: this can be meant as a non-fatal phase, where adjustments can be implemented to improve the company's condition. Instead, the last two stages represent what we really mean for distress/crisis that is, the inability to pay back the required amount to creditors. Thus, the crisis is fatal and the company is at the point of no return: no adjustments can be adopted and firm's destiny is all in the creditors' hands.

Also Falini (2011) followed the theory developed by Guatri (1995), defining the crisis path as constituted by the decline and crisis periods. The decline period, which can be divided in the incubation and maturation phases, is the moment when the first inefficiencies and imbalances show up, a period where firm's profitability starts to erode and the firm's image on the eyes of stakeholders starts to weaken, with the products or services offered that worsen, as well as the relationships with suppliers and customers. In the decline period the top management has the chance to stop and even resolve the inefficiencies and the related problems, otherwise the net results and the firm's economic value will collapse. The transition from decline to crisis phase is of difficult traceability and the boundary faded. Actually, the decline stage is one where net losses become significant, the cash flows unbalanced, the access to credit limited. As it is illustrated in figure 2.3, the sooner the causes of the inefficiencies are discovered and properly tackled, the earlier in time (t) and better will be the recovery of firm's value (W).

Figure 1.3 – The general process of crisis
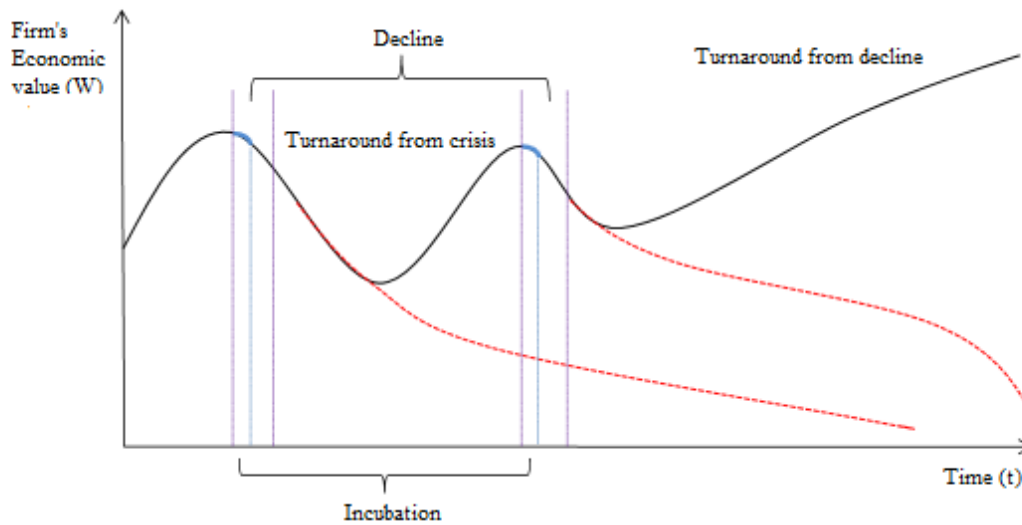
Finally, to sum up we can say that distress may be the outcome of irresponsible choices made by a firm's top management or, as it is usually the case, it is the final result of a slow and long decline that goes through a series of phases: generally speaking, these stages range from a potential and reversible one to a fatal and irreversible one, which corresponds to firm's bankruptcy. Most importantly, distress is usually caused by the occurrence of both an economic and a financial distress, with economic distress that is the consequence of operational problems, while financial distress means a firm inability to respect the obligations it has towards its creditors. However, it is financial distress that threatens more the going-concern, the existence of a firm, to the point of bringing it to bankruptcy. That is why we can state that the term "company in distress" generally refers to a firm that, in the near future, is expected to be not able to comply with the obligations it has undertaken, so it is a concept very similar to the one of financial distress. However, at the same time, when approaching a company in distress, it should be remembered that it will almost certainly present the characteristics of both economic and financial distress.

1.3   Different causes

We have just defined what distress generally means, thus we have introduced the concepts of economic and financial distress: however, since these are only the ultimate results of a complicated process, what we have now to investigate are the causes at the roots of distress. The way the current global economic crisis came to light in 2008 that is, with the bankruptcy of the investment bank Lehman Brothers and the governments obliged to save other major global financial services firms, remind us that irresponsible or simply wrong decisions taken by those people in position of exercising control and power may bring the firm into serious troubles, and rapidly too. This concept is not only confined to people at the top management roles, but also to all others at the middle and lower levels of the firm hierarchy whose actions can cause severe repercussions on the firm's future. We may identify the preceding causes as "Management incompetence", when the firm's managers cause a crisis condition unintentionally but simply because of a lack of expertise; "Management misbehavior", when the top management intentionally act in a non-ethic way knowing that this will cause serious problems to the firms' stakeholders. With respect to the employees in roles different from management ones, we may say that whichever misbehavior they undertake it will never affect the firm seriously if there is a proper system of internal control, one where employees at lower levels are adequately monitored by those at upper levels: we can refer to this problem as a "Lack of a proper system of internal control". Also Luerti (1992) emphasizes the fact that the inadequacy of, among other factors, the IT system in highlighting possible abnormalities in the economic and financial equilibriums is one of the major sources of distress.

From the review of the vast literature on this field, all the major causes of distress can be divided in the following macro areas:

    A. Internal causes – endogenous;

    B. External causes

        a) Industry level – partially exogenous;

        b) Macroeconomic level – exogenous.

We will begin our in-depth analysis from the internal causes, meaning those that are peculiar to each single firm because related to its specific characteristics. Management incompetence, Management misbehavior and Lack of a proper system of internal control all fall in this category. Another related cause at the internal level is the "Lack of a proper system of corporate governance": it is usually a source of serious concerns and instabilities for the firm, since it might lead to internal conflicts because of a lack of clear roles and powers, misalignment of different stakeholders' interests, etc. Other common causes internally to the firm are all those that can lead to economic distress that is, the sources of operational problems: e.g. an inappropriate firm's business model, a wrongly designed and/or implemented value chain, an improper products offering or products positioning, a wrong price strategy and/or cost structure, an imbalanced financial structure, etc. Coda (1975) connected the firm's solvency to two main factors that is, the solidity of the capital structure and the profitability level: he continued highlighting that distressed firms usually present a very weak capital structure and also a negative profitability. In particular, the level of indebtedness (measured as the ratio between equity and debt capital) and the liquidity level (calculated as the ratio between current liabilities and assets) are among the most determining factors causing distress. However, the author pointed out that even in the case a firm shows certain alarming levels of indebtedness and/or liquidity, it must be questioned how the firm has reached those levels: the focus is on firm's adopted policies with respect to investments, financing and dividends. What the researcher wanted to highlight is that the distress state is usually caused by wrong management judgments and choices. Also Whetten (1987), studying the causes of decline, highlighted that there have been firms in the same industry which have failed to adapt to external changing factors, while others have instead been able to successfully maintain or even improve their competitive position: thus, the management team was labeled as the discriminating variable. In relation to this topic, Whitaker (1999) pointed out that there are more firms entering financial distress as a result of inadequate management than as a consequence of economic distress.

Analyzing the internal causes in greater detail, it comes to our aid the categorization made by Liberatore et al. (2014), according to which we can identify five main causes of distress:

I. Inefficiency: when firm's functions or SBUs underperform with respect to competitors. Usually the production chain is the firm's area more subject to inefficiencies: in particular, these can be due to unsuitable plants or machineries, inadequate location or size of the plants, lack of employees' commitment or improper human resources, overstaffing, lack of effective incentive plans.

II. Overcapacity/rigidity: the excess of production capacity might be caused by a permanent reduction of market demand, a loss of market share, revenues growth lower than expected, the entry into the market of new competitors, etc. In turn, these problems are followed and worsened by a difficulty/impossibility of fixed costs to adjust to the new conditions.

III. Decay of products: when the products sold by the firm are misaligned with customers' preferences or are simply worse than those of competitors in terms of quality/price, then the firm will experience an erosion of the operating margins and usually also economic losses. Thus, the decay of products is basically due to the firm's incapacity to adapt to the changed market conditions, either through adequate R&D investments or sufficient marketing efforts and sales promotion, or simply because some competitors have came out with a more innovative solution/product.

IV. Lack of organization/innovation: lack of organization means that the firm is unable to adapt its business model and strategies to changes in market conditions; instead, lack of innovation entails firm's inability to exploit new opportunities when they arise.

V. Financial imbalance: it occurs when firm's outflows overcome the inflows, thus economic losses are recognized on the firm's income statements due to the unbalanced capital structure, where the high leverage leads to relevant interest expenses. In addition, this condition implies that the firm will also be unable to make the investments required to replace those assets being depreciated and amortized, as well as to guarantee the normal course of company's activities in the near future.

The importance of internal characteristics in relation to distress was also highlighted by Bruderl and Schussler (1990): they found out that the bigger the firm size, the lower the

probability of a future crisis; in addition, the legal form seemed to influence the probability of distress. Accordingly, SMEs actually have a higher probability of falling into distress with respect to big companies: in fact, usually it takes time to set up business relations, to establish the proper structure to operate, to identify systematic components of performance, to get access to further resources.

Turning our attention to the external causes, they can be divided into causes at the industry level and at the macroeconomic level. The category "industry level" gathers together those factors that affect all firms competing in a specific industry. As a matter of fact, the environment in which a firm competes is dominated by forces that are strictly correlated one with another: these forces are in a perpetual motion, since the change in one will trigger the reaction of the others, that in turn will lead to other responses and so on. These forces change from industry to industry, in fact we all know how much every industry differs from the others, e.g. in terms of profitability, types of players, regulations, etc. Thus, to understand these forces some common strategic and informative tools should be used, like the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, Porter's Five Forces analysis, balanced scorecards, decision trees, industry reports, etc. The investigation of the competitive environment should be performed on a regular basis in order to leave to these forces no ground to threaten the going concern of the firm. Only by way of example, the most common threats at the industry level are the followings:

- Changes in the customers' product preferences;

- Introduction of a more advanced type of technology;

- Relevant changes in the supply chain and/or in the distribution channels;

- Government modifications to regulations;

- Changes in the competitive forces (e.g. number and/or type).

These forces at the industry level have been considered as partially exogenous because, despite the fact that they come from the external environment, the competitive environment itself is also shaped by each firm's actions and so it presents some endogenous traits too. As discovered by McGahan and Porter (1997), the industry in which firms compete seems to account for 19% of the variance in profitability across

different firms. In a greater detail, industry effects were responsible for a smaller proportion of profit change in the manufacturing sector, while they had a greater influence in other sectors such as that of entertainment/lodging, services, wholesale/retail trade, and transportation. Another investigation by Madrid-Guijarro et al. (2011) analyzed the external non-financial factors which have affected SMEs in financial distress, in particular the forces acting in their competitive environment: the researchers discovered that an high bargaining power of buyers and an high degree of competition in high-technology industries were positively correlated with financial distress. Furthermore, financial distress was not influenced by environmental/external factors: this suggests how much different the probability of falling into distress is across different industries, according to our statement that the study of the firm's external environment is crucial in preventing and understanding a possible crisis.

The second and last source of external causes are the macroeconomic factors that is, those that affect all firms in all industries. These forces are completely out of the firm's control and, because of this, are usually the most dangerous: just think at how the current global economic crisis has been able to make thousands of firms going out of business. I could have made a long list of macroeconomic forces able to influence the results and conditions of a firm, however here will be presented only a few of them just to provide an example:

- − Real GDP growth rate;

- − Inflation rate (CPI – Consumer Price Index);

- − Unemployment rate;

- − Interest rates level;

- − Consumer confidence level;

- − Exchange rates.

Interestingly, despite the proposed categorization, most of the times it appears that the distress condition is the result of a series of linked factors. In fact, Mellahi and Wilkinson (2004) stated that organizational failure cannot be explained without understanding the complex connections between external forces and organizational dynamics. As depicted in Figure 1.5, organizational failure can be determined by four

different variables: Environmental factors, Ecological factors, Organizational factors, Psychological factors. Interactions between the external characteristics and the internal environment are represented in Figure 1.5 by R1 and R2.

Figure 1.5 – Determinants of organizational failure
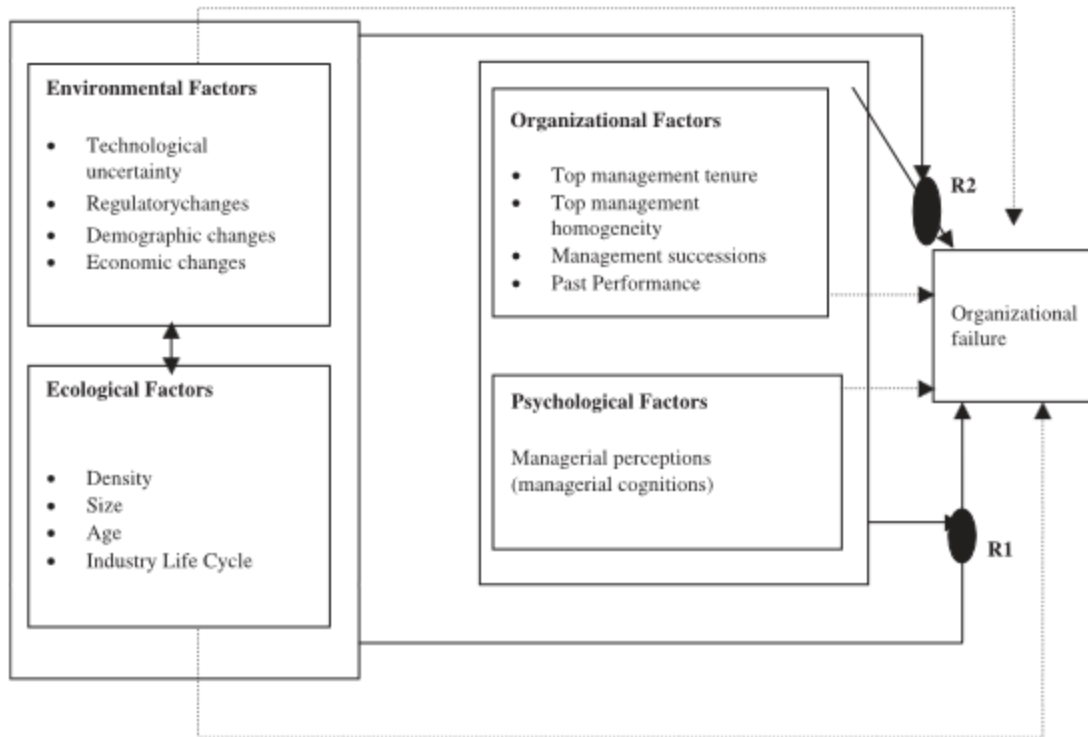
They further noted that organizational or environmental factors alone can lead to failure, but this is restricted to cases of a major environmental calamity or economic downturn, as well as to extreme cases of management misconduct. Mellahi and Wilkinson (2004, pp. 34) concluded that their framework of determinants of failure suggest that "There will be significant differences in the outcomes of the same internal factors across firms in different business environments and vice versa". In support of this theory, Falini (2011) stated that, despite all single variables identified by the literature throughout the years as possible causes of distress, the most recent studies focus on the complexity of the crisis phenomenon, and on how much is specific to each single entity. Citing the studies of Danovi and Indizio (2008), the effect caused by each single variable has to be judged in relation to its ability to permanently weaken the firm's KSFs (Key Success Factors) that is, those factors on which is based the firm's competitive advantage. Falini

(2011) continued stating that, from an ex-post analysis of a distressed firm, it is common to discover the presence of multiple destabilizing factors which, feeding one another, have made the firm pass from a declining to a distress state.

To sum up, it comes as no surprise that finding a unique cause of distress is actually rare, while most of the times distress is the result of a series of concatenated factors, both from an external and internal point of view.

1.4 Evidences of a distress situation and methods to detect them

One of the main problems when dealing with distress is that managers and entrepreneurs usually recognize the crisis when it is in its later stages or, even worse, when firm finds itself unable to fulfill the debt obligations. Obviously, it is always easier to make evaluations and judges ex-post: however, here will be presented a series of methods useful to recognize or predict a crisis at its first stages that is, when it is easier to find solutions for the underlying problems. The evidences to highlight a current or probable crisis are strictly related to the causes listed in the previous paragraph. And since the causes can be multiple and can hamper at any time the firm from several fronts, a detailed investigation must be scheduled regularly.

Some essential analytical tools to find or anticipate a possible crisis are the already mentioned SWOT analysis, Porter's Five Forces analysis and industry reports: these tools help to perform a strategic examination not only of the firm's itself, but also of the industry and the competitive environment in which it operates. These instruments are indispensable to every manager and entrepreneur and must be used on a regular basis.

Other possible methods to recognize a crisis in advance are based on the identification of the external manifestations of the crisis factors: these methods are based on the intuition, as suggested by Liberatore et al. (2014). In fact, recall that normally a crisis goes through a series of stages, starting as an initial small problem and then becoming a serious one; thus, the external manifestations of a possible future crisis, being only initial signals, might be underestimated or pass unnoticed, so it is solely the managers/entrepreneurs' ability, experience or insight that makes possible their recognition. The most common indicators, the corresponding probability of recognition

as well as the associated capability of finding adequate solutions is showed in the table below.

Table 1.1 – Crisis factors, their external visibility and possibility of adopting corrective solutions

CRISIS FACTORS	EXTERNAL RECOGNIZABILITY	POSSIBILITY OF INTERVENTION
Belonging to mature or declining sectors	High	Low
Belonging to sectors in difficulty because of a decline in demand	High	Low
Loss of market share	Medium	Medium
Production inefficiencies	Low	High
Sales/Marketing inefficiencies	Medium	High
Administrative inefficiencies	Low	High
Organizational inefficiencies	Low	High
Financial inefficiencies	Medium	Medium
Rigid cost structure	Medium	Medium
Lack of planning/scheduling	Low	High
Low R&D investments	Medium	High
Low products innovation	Medium	Medium
Financial imbalances	High	Medium
Balance sheet imbalances	High	Medium

Blocked prices	High	Low

The problem is that, especially in SMEs, managers and entrepreneurs often have not enough time or adequate skills to recognize a possible future crisis from its external manifestations. So, alternatively, the analysis of company's financial statements – that is, the Balance sheet, Income statement, Cash flow statement and Statement of changes in equity – and their comparison across different years can provide a first general warning bell. In particular, with respect to the Income Statement analysis, it is important to consider every item in relation to the each year's total turnover, so that more accurate and intuitive comparisons between different years can be performed.

A more in-depth investigation should then be performed through the calculation of ratios and indexes based on various items of the company's financial statements: this is called ratio analysis. A first category of indexes are the profitability ratios, which can be computed to investigate the presence of what we have previously called economic distress: these ratios analyze the firm's overall profitability and can be used to study its development over the years, as well as can be easily compared with those of other companies operating in the same industry. The most common profitability indexes are the ROS, ROE, ROA, ROIC.

Table 1.2 – Profitability ratios

PROFITABILITY RATIOS	FORMULA	PURPOSE
ROE	Net income/Shareholders' equity	This ratio indicates the profit generated per each unit of equity capital invested
ROA	Net income/Average total assets	It is a measure of the revenue-generating capacity of the firm's assets
ROS	EBIT/Total revenues	The ROS represents the amount of income from the operating

		activities earned per each unit of revenues
ROIC	NOPLAT/Invested capital	It is the profit from the operating activities the company gets for every dollar of invested capital

Source: Personal elaboration

However, according to Koller et al. (2010), ROIC is the best indicator to understand the company's performance because it is based upon the NOPLAT that is, the after-taxes profits coming from the core operations of the firm: thus, ROIC focuses only on the profits coming from the operating activities, excluding the profits coming from investing and financing activities. The ROE, by using the Shareholder's Equity, considers also the capital structure of the firm, making more difficult a comparison with other firms' profitability. The ROA instead, being based on the average total assets employed by the firm, considers also the non-operating ones that is, the assets that do not participate at the firm's core activities; furthermore, it does not take into account the firm's operating liabilities, which are capable of diminishing the total amount of equity required. Lastly, remember that the ROIC can be computed both including and excluding goodwill and acquired intangibles: however, are both very useful for comparison purposes, since the first shows how much profitable is the firm after having paid the required acquisition prices, while the second (without goodwill and acquired intangibles) represents the profitability of the firm's core activities.

Other useful indexes are the ones that help to understand how much the firm is efficient in managing its assets, and in particular those constituting the working capital (WC). The WC is the difference between current assets and liabilities, representing the balance of resources used by the firm in the short-run that is, in the daily operations. The optimum level of WC is influenced by the industry in which the firm competes, but in general it should be neither too low nor too high: a low level of WC means that the firm has a little liquidity cushion in performing its daily operations, and it might found itself in a dangerous situation if an unexpected outflow of resources occurs in the future. Also a too high value means that the WC management is imperfect, since it might indicate that the company has difficulty in collecting its credits and/or has a too high level of

inventory. The WC is usually analyzed in each of its components through some useful ratios, for example those suggested by Palepu et al. (1996) were:

- Accounts receivables turnover, accounts payable turnover, inventory turnover;
- Days' receivables, days' payables, days' inventory.

Accounts receivables turnover, accounts payable turnover, and inventory turnover are all used to understand how efficiently they are managed by the firm while running its core operations. Days' receivables, days' payables, days' inventory serve all the same goal of the previous ones but they express the efficiency of their management in number of days required to be collected (receivables), sold (inventory), paid (payables).

Other very meaningful ratios are those used to understand the risk that the firm fails in paying its debt obligations when due: thus, it is evaluated the risk of what we have called financial distress, which is inherent to the firm's liabilities. In particular, it is usually evaluated the company's ability to meet the debt payments both in the short and in the long run. As a matter of fact, Palepu et al. (1996) distinguished between short-term liquidity and long-term solvency, and proposed some related indicators. Also Pratt et al. (2000) made a useful division between short-term liquidity ratios, balance sheet leverage ratios and income statement coverage ratios. Their works have been combined into two unique tables of ratios useful for checking the ability of a firm to fulfill the payments of its liabilities both in the short and long term: the obtained tables are displayed below.

Table 1.3 – Short-term liquidity ratios

SHORT-TERM LIQUIDITY RATIOS	FORMULA	PURPOSE
Current Ratio	Current assets/Current liabilities	Firm's ability to pay its current liabilities
Quick (Acid-Test) Ratio	(Cash & Cash equivalents+Marketable securities+Accounts receivables)/Current	Firm's ability to meet its current liabilities with the use of solely its more liquid assets

		liabilities	
Operating Cash Flow Ratio	Cash flow from operations/Current liabilities		Firm's ability to fulfill its current obligations using only the cash generated by its core operations

Source: Personal elaboration from Palepu et al. (1996) and Pratt et al. (2000)

Table 1.4 – Long-term solvency ratios

LONG-TERM SOLVENCY RATIOS	FORMULA	PURPOSE
Debt to Equity Ratio	(Short term debt+Long term debt)/Shareholders' equity	A measure of the firm's financial leverage: it gives the proportion of how much debt capital has been raised by the company with respect to the capital provided by the shareholders.
Debt to Capital Ratio	(Short term debt+Long term debt)/(Short term debt+Long term debt+Shareholders' equity)	This ratio is another one indicative of the firm's capital structure: it measures the proportion between the debt financing and all the sources of financing.
Long-term Debt to Capital Ratio	Long term debt/(Short term debt+Long term debt+Shareholders' equity)	This ratio is similar to the Debt to Capital Ratio, but this highlights solely the proportion of long-term debt with respect to firm's total capital.
Equity to Capital Ratio	Shareholders' equity/(Short term debt+Long term debt+Shareholders' equity)	Another ratio indicative of the firm's capital structure: the proportion of equity capital with respect to the totality of capital employed by the firm.
Fixed Assets to Equity Ratio	Net fixed assets/Shareholders' equity	Part of fixed assets (essential for the company activities) financed by the non

		interest-bearing capital.
Times interest earned	EBIT/Interest expense	Firm's ability to cover the interest payments related to debt financing with the earnings resulting from its core operations.
Coverage of fixed charges	(EBIT+Fixed charges)/Fixed charges	This ratio is similar to the previous one but this measure the firm's ability to fulfill not only the interest payments but also the principal payments as well as the lease payments.

Source: Personal elaboration from Palepu et al. (1996) and Pratt et al. (2000)

Another useful way to find out if a company is long-term solvent with respect to its liabilities is to apply what Reilly and Schweihs (1999) called the "cash flow test": the test assesses if the firm will have enough cash generation in the future to make the debt payments when due. It is based on the DCF valuation method, thus projections of the firm's future performances are made, cash inflows are then calculated and compared with the scheduled cash outflows for the debt payments. In this way it is tested if the firm will have enough liquidity at every time a debt repayment is required. The analysis of the firm's cash flow generation capacity has always to be carried out, since it gives useful information about the firm's overall profitability.

Turning back to ratio analysis, so far we have presented only some of a series of ratios that is, the most used by appraisers, managers and entrepreneurs. However, which are the indexes that are more able to predict whether a firm will or will not file for bankruptcy in the future? With regard to this, Luerti (1992) pointed out that the ratios more capable of predicting in advance the bankruptcy of a firm are the followings:

a) (Current assets - current liabilities)/total assets;
b) WC/short-term debts;
c) (Total assets - total liabilities)/Debt;
d) Self-financing capacity/Debt.

Another study of Palepu et al. (1996) highlighted that the most critical figures/ratios able to predict one year in advance a firm's inability to fulfill its debt payments are:

a) Profitability = Net Income/Net Worth;

b) Volatility = Standard Deviation of Profitability;

c) Financial leverage = Equity Market Value/(Equity Market Value + Debt Book Value).

Interestingly, as you may notice, there are no liquidity ratios: this is because, even if a firm has a strong capital structure that is, it has a large "equity life vest" able to absorb the net losses, this will not be sufficient for the firm to escape bankruptcy if it is not able to fix its economic/profitability problems in an adequate time period.

The importance of predicting the possible future insolvency of a firm has attracted the attention of many appraisers, especially financial institutions which, by lending money to the firms, satisfy their liquidity and investments needs. Thus, models that take into account multiple factors in order to investigate a company's current financial condition and predict the probability of its future bankruptcy have began to be developed. One of the first models that appeared was the "Z-Score" proposed by Altman in 1968: as Altman himself explained (1991, p.69), this model "Combines traditional financial measures with a multivariate technique known as discriminant analysis…[in order to give] an overall credit score [to the firm being valued]". Analytically, the general formula is:

$$Z\ Score = \ a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5$$

To each measure or factor considered (*x*) it is assigned a corresponding weighting factor (*a*) that amplifies or diminishes its effect on the result. The overall credit score represents how likely is that the firm falls into bankruptcy in the future: in particular, a lower score entails an higher possibility of becoming insolvent. In his model Altman utilized the five variables he found, from historical data, were more explanatory of a distress situation:

1. x_1 = WC/Total Assets;
2. x_2 = Retained Earnings/Total Assets;

3. $x_3 =$ EBIT/Total Assets;

4. $x_4 =$ Equity Market Value/Total Liabilities Book Value;

5. $x_5 =$ Sales/Total Assets.

From the analysis of historical data of both companies which have filed for bankruptcy and have continued as a going-concern, Altman also established the correct weights (*a*) that enable to distinguish between a critical and non-critical distress. Altman's resulting model for insolvency prediction is the following:

$$Z\ Score = 1{,}2x_1 + 1{,}4x_2 + 3{,}3x_3 + 0{,}6x_4 + 1x_5$$

Analyzing in detail the variables and the corresponding weights assigned by Altman, we can see how insolvency is driven by both what we have previously defined as economic distress and financial distress: in fact, the Z Score formula considers both profitability ratios (such as EBIT/Total Assets) and liquidity ratios (WC/Total Assets), as well as the firm's capital structure (Equity Market Value/Total Liabilities Book Value). Particularly, it is the third variable that is, a profitability ratio, that possesses the highest explanatory value: thus, economic distress seems to have a relevant influence on the possible future bankruptcy of firms. To sum up, in order to categorize the firm you are interested in, Altman (1991) suggested that firms obtaining an overall credit score greater than 3 have to be considered as economically and financially "healthy", while those scoring less than 1.8 (up to reaching also negative values) as firms in distress; furthermore, a result between 1.8 and 3 means that there are critical elements in the firms, thus additional in-detail investigations are needed. It is worth noting that, subsequently, Altman has revised his model slightly changing the considered variables as well as applying some minor changes to the weights attributed to each variable.

In all the distress prediction models, as you can also notice in the formula of Altman's Z-Score, as well as in all the ratios formula, the result is highly dependent on the variables chosen by the appraiser, so most of the times there is also a subjective component in the valuations. For this reason we have to pinpoint once again that the use of these models and ratios cannot exclude a comprehensive analysis of the firm in question through the already mentioned strategic tools such as the SWOT analysis, Porter's Five Forces analysis and industry reports: in fact, only the use of the just mentioned methods, combined with the models for insolvency prevision and the ratio

analysis, is able to provide a comprehensive picture of a firm's real economic and financial situation, yielding to a more precise and reliable prediction of what the firm's future is most likely to be.

Another distress prediction model which attracts the attention of practitioners was the probabilistic model of bankruptcy developed by Ohlson in 1980: differently from Altman's model, this one was able to provide directly a probability of default of a firm that is, a value between 0 and 1. In particular, Ohlson (1980) identified four basic factors statistically significant in determining the failure of a firm within 1 year:

- Size of the firm;

- A financial structure measure;

- A measure of performance;

- A measure of current liquidity (but not with the same significance of the previous three indicators).

Several other studies have undergone in order to discover which variables are more able to predict future bankruptcy, since the choice of the explanatory variables in the predictive models are crucial to their effectiveness. Recalling the studies of Pindado et al. (2008), they used the already described definition of distressed company to set up a logistic model for estimating the likelihood that firms become financially distressed. Their model was fitted in SMEs' data and made use of a small set of variables that financial theory has proved are the most correlated with financial distress: profitability, financial expenses and retained earnings. The profitability measure is based on the EBIT, an indicator able to indicate how efficiently the firm is managing its assets and whether or not it is producing enough cash to meet its financial obligations. In addition, this indicator is free of any tax and debt related factors, as well as it is the main driver of liquidity, since creditors usually look at firm's profitability when deciding whether or not to extend/renegotiate credit payments. Their model then used financial expenses to account for the level of debt the firm has employed: financial expenses are claimed to had proved to be better indicators of future insolvency than ratios based on debt level. The last explanatory variable the model used is firm's total reinvested earnings or losses

over its entire life: it is used as a measure of cumulative profitability over time and capability of self-financing.

Darrat et. al (2016) later discovered that, not surprisingly, firms have a greater chance of filing for bankruptcy if they are less profitable, highly leveraged, smaller in size, and have more volatile returns. More interestingly, their studies also found out that the firm liquidity (which they calculate as the ratio between cash and short-term assets over the total market value of assets) is not a so crucial factor for bankruptcy: historically, firms near to insolvency have showed similar liquidity to other companies. This partly confirms previous researchers' indications, as well as some doubts posed by the results obtained by Ohlson (1980). The studied sample of firms also highlighted that, those companies that in the near future would be insolvent had lower share prices, lower revenues and were less diversified with respect to those firms that would not file for bankruptcy. The authors also stated that performance is not the unique variable causing bankruptcy, and that awful results may not necessarily bring the firm to a flash condition of insolvency: firm's indirect costs, sales sensitivity and the proportion of non-marketable assets are some of the most relevant variables.

Finally, it is worth noting that in the last decades other techniques for insolvency prediction have been developed. As reassumed by Liberatore et al. (2014), these techniques are: regression, discriminating analysis, neural networks, genetic algorithms, technique of the main components, RPA analysis.

1.5 General problems associated with solving distress

Once managers or entrepreneurs have discovered some evidences of crisis through the use of the methods previously illustrated, what they can actually do, if there is still something to do, depends primarily on which stage of the crisis path they found themselves in. As a matter of fact, recall that usually distress is easily detectable when it is in the latest stages that is, in the more critical ones: so, the sooner managers or entrepreneurs are able to see the proofs that distress is taking place, the higher the number of solutions available to them. Furthermore, the solutions managers can use to resolve problems that have occurred are obviously strictly related to the causes of distress. With regards to this, recall the distinction between internal and external causes

of distress: the more the causes are internal (endogenous), the more they are fixable. On the contrary, the more the causes are external (exogenous) – e.g. think at a global economic crisis - the lower will be the number of available remedies. A similar reasoning can be applied if managers have to deal with economic and/or financial distress: economic distress is usually a problem related to strategic or operational issues and thus it is more resolvable, while financial distress usually implies more constraints on the actions a firm might adopt, making it less manageable. The topic of how a firm can manage a situation in which it has no more liquidity to use or to obtain in order to pay the obligations it has undertaken is particularly critical because liability contracts, being legally binding agreements, give credit-holders the right to require the payments from the firm, a right that is enforced by law. This implies that, if the firm it is not able to find additional funds to pay back its liabilities, it may be obliged to sell some of its assets or ask creditors for the restructuring of debts terms, otherwise it will have to file for bankruptcy. Thus, every firm should be very careful when deciding and managing its capital structure that is, how much money to raise in the form of equity capital (which is interest free and it has not to be repaid in the future) and debt capital. In fact, when economic distress becomes evident that is, when the firm is experiencing profitability problems, it may have no more liquid assets to exploit and often it has breached one or more covenants of its debt contracts: this is the moment in which major problems arise because firm's survival is challenged and depend on the creditors' will. As a matter of fact, if firms are able to recognize that the first signals of a crisis are occurring, e.g. when they experience some economic disequilibria, they have at their disposal a lot and less costly solutions to deal with it: they might make an equity injection or repurchase part of their debts to readjust the capital structure; they might divest some of their unprofitable or non-strategic companies and/or assets in order to acquire the necessary liquidity; they might renegotiate, at favorable terms, the conditions of current loans with financial institutions. Instead, if the crisis is at its later stages because recognized too late or simply because the firm was unable to stop the decline – thus worrying economic-financial disequilibria are evident – firms have no more the possibility to use solutions implying favorable terms, but they are obliged to undertake more extreme and costly ways: they might have to sell strategic assets, because they had already sold the non-strategic ones or because the sale of the latter are

not sufficient to resolve the problems; they might have to utilize factoring to gain immediate liquidity; they might be obliged to use social security cushions for its employees; they might renegotiate, at less favorable terms, the conditions of current loans with financial institutions; they might be forced to give up part of the company's shares. Finally, when the crisis is at its peak, the firm finds itself with no other ways but to discuss its situation with creditors, who now have the last word on firm's destiny.

More generally we can say that, as affirmed by Eckbo (2008), since financial distress occurs when firm's liquid assets are not enough to meet obligations it has undertaken, to resolve distress firms can either restructure the assets or/and restructure debt contracts. Asset restructuring implies selling assets to gain extra liquidity (a strategy useful whenever a firm is not able to find other sources of funds); debts restructuring implies the renegotiation of debt terms (reducing or delaying repayments) or exchange equity for debt claims.

At this point it should be clear that the state of financial distress ultimately leads the firm to discuss its situation with credit holders, and the more the firm owes to creditors the more they have the firm's destiny in their hands. In fact, usually the firm in financial distress has to negotiate its future with debt holders, in particular it is at stake how and when the repayment of the defaulting liabilities will take place: in basic terms, creditors have to decide whether to give the firm the necessary conditions it requires to continue its operations (thus postponing the debts collection at a later date), or to pretend the payment as soon as possible obliging the firm, for example, to sell some assets or even to file for bankruptcy. The problem is that this negotiation is characterized by unique issues which affect both the defaulting part (firm's equity holders and management) and the damaged part (firm's credit holders):

A. *Information asymmetry*: the first issue is the information asymmetry that usually exists between firm's shareholders/managers and creditors about the firm's real economic and financial condition. In fact, only people inside the firm know what the situation really is and have better insights about which might be the most likely development of the company in the near future. This usually implies that, if firm's current situation is critical and its near future is even doubtful or worse, firm's shareholders and managers might try to hide some relevant information

and even present facts that are better than what they actually are. However, if the situation of the firm is critical but resolvable, firm's shareholders and managers will equally present as more data as they can in order to persuade creditors to give them the necessary conditions to continue the operations. So, it is all on creditors' side to verify the quality of data and forecasts presented by the firm. This can be seen as an issue similar to the lemons problem envisaged by Akerlof (1970) in the market for used cars: but here the problem is to assess which are the true-quality data among those which the firm presents to credit holders. And, in this respect, the more the firm's creditor is an eminent institution, the more bargaining power it possesses.

B. *Uncertainty*: as it can be inferred from the information asymmetry issue, the second relevant problem is that all the negotiation process is surrounded, from the beginning to the end, by a great level of uncertainty. When institutions/third parties lend money to a company, the borrowing contract schedules the debt repayments at fixed moments in the future, and the borrower's debt repayment ability is assessed before granting the money: in this way the lender is supposed to be certain about the fact of recouping its money in the future, increased by an amount of interests. However, when for some reasons the firm is no more able to make the debt repayments when due, firm's debt holders become uncertain about when and how much of the money they had lent will be repaid. When deciding whether to make the company continue its operations or make it cease to exist, the creditors choose between the available solutions in consideration of the amount of money that may be recouped, the degree of certainty of that repayment, the time period that will be required to obtain it. Furthermore, uncertainty is more severe as the time to obtain a certain repayment increases. Particularly, uncertainty is relevant both in the case the firm continues to perform its operations and also in the case it files for bankruptcy. In fact, if the company continues with its operations and it has been granted by creditors to repay its liabilities in the future, the repayments will be subject to the firm's future cash flows which are intrinsically not certain. Similarly, if the company files for bankruptcy ceasing to exist and its assets are sold in an auction, then the

future debt repayments are closely linked to the amount of money gained through the auction sale, which is by intrinsically uncertain as well.

C. *Conflicts of interest*: the third big issue regards the conflicts of interest among all firm's stakeholders that a situation of financial distress triggers. As suggested by Altman (1991), in the case to a firm it is granted to continue as a going-concern, there will often be conflicts over the way to solve the crisis, because different plans usually imply different allocations of roles as well as remunerations. In addition, strategies to regain financial and economic viability also consider the lay-off and substitution of several firm's key employees, which constitutes another reason for strong internal conflicts. During the negotiation process, managers will probably support those parties which grant them the highest payoff and/or to maintain their roles inside the firm; shareholders will push for having the possibility to continue the firm's operations; instead, credit holders will most probably choose the option that possesses the best trade-off between the amount that will be recouped, the associated probability of occurrence and the time that will elapse until the debt repayment. However, who is more at the center of this problem of conflicts of interest are managers: in fact, in a normal situation, managers' duty is to behave and take decisions in order to maximize the value of the firm, which corresponds to maximize the value pertaining to the firm's shareholders. However, when the firm goes through financial distress, as highlighted by Eckbo (2008), the fiduciary duties of executives and managers are no more only towards firm's shareholders, but also towards creditors, since they have to increase also the value pertaining to debt holders. For this reason, aligning incentives, in order that both parts are best served by managers, may be quite a challenging task. Finally, conflicts of interest are more severe when the number of debt holders is high, because in the negotiation process you have to find a solution that mediates between the desires/interests of several different parts.

Thus, before continuing in our analysis it has to be clear that, as Altman (1991, p.251) said, "financial distress [has to be resolved]…in an [uncertain] environment [full] of imperfect information and conflicts of interest".

And since every choice made in this uncertain and critical stage can lead to the worst outcome, it has been also widely studied how corporate governance and management choices affect the near future of the distressed firm. In fact, with respect to corporate governance and bankruptcy risk, Darrat et. al (2016) studied whether the complexity of the company and its specific needs in terms of knowledge increase the probability of the firm to fall into bankruptcy or not. Surprisingly, it was found that complex firms have a lower risk of bankruptcy if they opt for a larger board of directors: this is because usually additional directors are able to bring to complex firms better knowledge, expertise and experience. Furthermore, companies requiring specialist knowledge are less likely to fall into distress if the number of inside directors is lower, with the opposite being true for non-sophisticated firms. Their studies explain that non-sophisticated companies do not benefit from a larger board of directors because the advantages it brings are lower than the related disadvantages, which can be, for example, the creation of free-riding phenomena and coordination problems. Another finding was that, when financial distress is acute, governance changes would have little impact over the firm future: this is due to the fact that changes in corporate governance are able to effectively shape the firm strategy and performance only in the medium-long term. Thus, if entrepreneurs/shareholders (especially those of family businesses) are almost in an insolvency situation, it is most likely that a change in the structure of corporate governance will not take the firm out of bankruptcy.

Whitaker (1999) explained that management actions are a crucial variable for the recovery of firms which entered into financial distress as a result of inadequate management, but not for those which fell into financial distress because of economic distress. This implies that firms with serious competitiveness related problems will find difficult to overturn their distress state even changing the management team; instead, those firms that are in crisis just because of poor management choices will probably recover by just changing the inadequate management.

Smith and Graves (2005) found out that the success of a turnaround strategy was highly positively correlated with the degree of financial distress: the more rooted the distressed state, the less the probability of conducting a successful turnaround. This once again supports the idea that the earlier the crisis is tackled, the more likely a success is. The

two researchers discovered also that distressed companies which expand their assets have higher possibilities of recovering, as opposed to those which desperately sell-off their productive assets in an attempt to raise cash.

Molina and Preve (2009) studied instead the effect that financial distress has on trade receivables, and how the management of the credit granted to firm's customers affect the future of the firm itself: they discovered that firms tend to increase the level of trade receivables when they have profitability problems. Instead, they usually reduce trade receivables when in financial distress. Furthermore, they pinpointed the difficulty that distressed firms in competitive industries usually have to reduce their trade receivables with respect to firms in concentrate industries: this is due to the fact that in competitive industries firm' clients receive less pressures to maintain a reputation for reliable payments, given that the supplier is likely to fall into bankruptcy and that there are alternative suppliers in the market. What also emerges from their studies is that whenever a firm near to insolvency reduces its trade receivables, it is likely it will have to face a drop both in sales and stock returns.

Baghat et al. (2005) investigate the investment policy in distressed firms. Their results show a diverse relationship between investment decisions and internal funds: if the distressed firm operates at a profit, it shows a tendency to invest that is similar to that of healthy firms; instead, if the distressed company is operating at a loss, it tends to invest either less or much more than the previous year. The increase in investment of distressed firms operating at a loss has historically be funded by equity claimants: thus, as Bhagat et al. (2005) said, "Equity claimants may lose from providing financing to an unprofitable firm, but nevertheless gamble for the firm's resurrection". So it is clear that some entrepreneurs/shareholders are sometimes not ready to let their firm file for bankrupcty even in situations where there is little else to do.

What instead matters to finance analysts and investors judging a distressed company is usually the future cash flows that the distressed company is able to provide that is, its future ability to create and not to "burn" cash. This theory has been confirmed by the studies of Assaf (2007), who documented that share prices of firms in a difficult situation are moved primarily by news related to expected future cash flows, and not to expected future returns.

To sum up, despite the fact that each firm has its own peculiarities and must be treated accordingly, some important lessons from the past can be learnt in order to avoid the worst outcome for a firm: bankruptcy.

1.6   Tools provided by the Italian legislator: out-of-court workouts and in-court resolutions

When firms are obliged to discuss their situation with creditors – because of their inability to cope with obligations they have undertaken – the Italian Bankruptcy Law (L. Fall) has provided to companies' shareholders and managers a series of tools to deal with financial distress. We can distinguish between out-of-court workouts and in-court resolutions: the first option entails the stipulation of private agreements between the firm and its creditors on how to resolve the crisis, while in the second alternative distress is resolved through a court-assisted process. Firms are assisted in this choice by professionals and consultants in the bankruptcy's field, which suggest firms the most suitable way according to their evaluations and experience, also in respect to cases they have treated in the past. Usually the choice is taken after the two ways of resolution have been weighted for some factors such as total cost, length of the process, level of uncertainty surrounding the real economic and financial conditions of the distressed firm: in fact, the greater the level of distress the firm is experiencing, the more the crisis will be resolved in-court, because it implies a higher level of protection for creditors. In the last years, in the Italian overview we have seen many distressed firms preferring in-court resolutions, especially in the cases where firm and creditors agree on the will of trying to take firm back to a normal situation: accordingly, credit holders accept to aid the company but at the same time they receive more legal guarantees.

Figure 3.2 represents in more detail all out-of-court workout types and in-court resolutions.

Figure 1.7 – Legal institutions to deal with distress: instrument, type, purpose
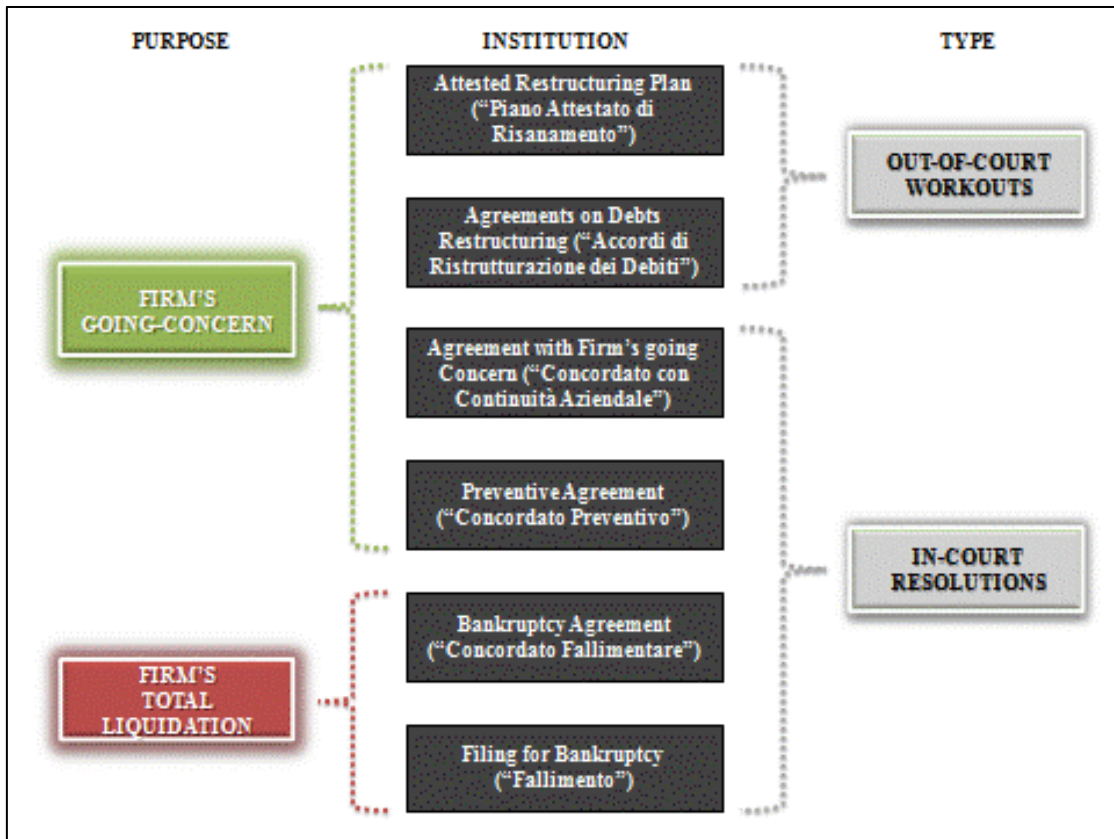
As it can be seen, the majority of these institutions have been designed focusing on the protection of firm's going-concern, thus shareholders are provided with more defensive rights with respect to credit holders, especially with the last modifications to the Bankruptcy Law in 2015 (d.l. 27 giugno 2015 n.83). However, who decide the company's destiny are always creditors, both in the case of out-of-court and in-court resolutions: credit holders usually have to vote among different available options concerning the firm's future and they obviously choose the one that is more convenient from their perspective that is, the one able to guarantee them the highest return, weighted by such factors as certainty of payment and required time. However, distressed firms usually owe different amounts of money to different creditors, and each creditor has usually a diverse level of priority in the case of debt repayment: this implies that different creditors might prefer opposite future plans, with higher priority creditors voting for less risky plans able to guarantee full repayment only to senior debts, while lower priority creditors voting for more risky projects able to satisfy also unsecured or

junior debts. That is why it is necessary majority consensus in the voting. Buttignon (2015) explained that the possible available options among which creditors have to express their preference are:

I. <u>Going-concern plan proposed by firm's current shareholders</u>: usually this is a plan that entails radical changes, since shareholders have everything at stake (it might also implies changes in current firm's management if it is considered responsible for the distress situation).

II. <u>Going-concern plan which entails new owners but same firm's assets</u>: this plan is usually formulated by people outside the firm, who often have a very different vision of the company with respect to that of firm's current shareholders and managers.

III. <u>Going-concern plan involving an M&A transaction</u>: this plan main objective is to exploit potential synergies the firm can obtain through the union with other companies (or simply the distressed firm might be targeted by another entity that want to acquire specific assets/technologies which would be more costly to obtain in other ways). Since the firm is subject to an M&A transaction, this option implies also a change in ownership.

IV. <u>Firm's total liquidation</u>: the firm files for bankruptcy and it finally ceases to exist with all its assets that will be sold separately in a public auction, and the proceeds used to satisfy creditors' claims.

Thus, each different plan concerning the distressed company's future yields to a different firm value and also to a different result in terms of possible returns, time required, underlying risks. All going-concern plans are generally based on a reorganization process called turnaround, aimed mainly at bringing company back to a situation of economic-financial equilibrium. The turnaround plan explains in details all main players involved in the company rescue, the competitive strategy and business model that will be adopted as well as the necessary related implementing actions, the debts restructuring program and the sources of funds used, the future financial projections and the expected results. Liberatore et al. (2014) distinguished between four main types of turnaround strategies, which are all displayed in table 1.5 below.

Table 1.5 – Turnaround strategies

Restructuring: it aims at increasing the efficiency of production processes, reducing fixed costs and improving both the financial and asset management. Competitive strategies remain unchanged.	**Reconversion**: it entails a change in competitive strategies, in particular are researched new markets/products combinations. Usually for the implementation of this strategy are necessary relevant expenses as to realign firm's assets to the new business model.
Downscaling: it implies the downsizing of the firm size, especially with regards to the personnel and assets dedicated to unprofitable SBUs. A general costs reduction and major focus are the ultimate objectives of this strategy.	**Reorganization**: its goal is to improve firm's management and governance structure, as well as internal control system and planning practices. The new organizational structure will be more efficient implying lower wastes inside the company.

Source: Personal elaboration from Liberatore et al. (2014)

After the going-concern plans with the relative different turnaround strategies have been proposed by the various parties, there is usually a negotiation of the main terms, in particular with regards to the debt renegotiation and/or repayment. If the majority of creditors agree on a particular plan, preferring it to the firm's total liquidation, then it is put into action. The complying with this plan will be constantly checked and usually it is subject to some modifications to align underlying strategies, objectives and projections to actual developments.

Turning back to the institutions provided by the Italian Bankruptcy Law, now we will analyze each of them in detail.

1.6.1   Attested Restructuring Plan - "Piano Attestato di Risanamento"

The Attested Restructuring Plan ("Piano Attestato di Risanamento"), is governed by art. 67, co. 3, lett. *d*) l. fall., integrated by the dispositions of art. 217-*bis*, by art. 263-*bis*, l. fall., and by art. 88, co. 4, D.P.R. n. 917/1986. As explained by Bonfatti and Censoni (2013), it represents the actions distressed firm's shareholders/entrepreneurs propose to undertake in order to resolve the situation of financial distress and bring firm back to financial equilibrium. The Plan has not necessary to be the result of an agreement with creditors. In fact, although in general also the Plan will be based on an agreement with

prior creditors, it might also be built on: (i) an agreement with new creditors willing to fund the firm; (ii) an agreement with partners different from creditors; (iii) shareholders'/entrepreneurs' unilateral initiatives (e.g. an equity increase). Furthermore, the firm's financial statements as well as the Plan have to be guaranteed by a qualified and independent professional; there are also prerequisites that have to be fulfilled in order to have access to this institute, and these requirements are both objective and subjective. The objective prerequisites pretend the existence of an indebtedness level and a financial situation in need of being rebalanced. In addition, this discipline cannot be used if the distressed firm had already started a liquidation process. The subjective prerequisite entails that, since this legal instrument's goal is to favor the firm's going-concern, it should be accessible only to shareholders/entrepreneurs. Lastly, this institution is the most private way available to firms to resolve financial distress, because it does not provide for the court intervention.

To sum up, Bonfatti and Censoni (2013) added that the Attested Restructuring Plan is particularly suitable for those restructuring plans proposed by distressed firm's shareholders/entrepreneurs or for the ones that are based on an agreement with a small number of creditors/interested third parties.

1.6.2 Agreements on Debts Restructuring – "Accordi di Ristrutturazione dei Debiti"

The Agreements on Debts Restructuring ("Accordi di Ristrutturazione dei Debiti") are governed by art. 182-*bis* ss. l. fall., integrated by art. 67, co. 3, lett. *e*), by art. 217-*bis*, by art. 236-*bis*, l. fall., by art. 88, co. 4, and by art. 101, co. 5, d.p.r. n. 917/1986. As explained by Bonfatti and Censoni (2013), they consist of an agreement for debts restructuring with creditors representing at least the 60% of firm's debts, with the debts restructuring's feasibility (and firm's financial statements data) that has to be certified by a qualified and independent professional, particularly in respect of its ability to entirely satisfy non participating creditors within 120 days from the approval of the above-mentioned agreement. In fact, the Agreements are binding only for compliant creditors, whereas they do not bind creditors who do not participate and which must therefore be entirely repaid (this is a defensive right conceded to those that do not agree with the proposed solution). Furthermore, the Agreements have to be approved by the

court to be effective. Even for this institution are provided both objective and subjective prerequisites. The objective prerequisite for using this instrument is that the firm has to be in a situation of crisis (art.182-*bis*, co.1). The subjective prerequisite instead prescribes that only shareholders/entrepreneurs can apply for this instrument, but it does not exclude the possibility that non-insolvent firms can apply according to the criteria of art.1 l. fall.

Bonfatti and Censoni (2013) also underline that the Agreements on Debts Restructuring are particularly useful for those restructuring plans in situations where distressed firm's liabilities are concentrated in a small number of creditors (e.g. banks), so that it is easier to obtain the required 60% of acceptance. However, it might be problematic the requirement that non-participating claim holders have to be entirely repaid, given the firm's situation of financial distress and thus of lack of liquidity.

1.6.3 Preventive Agreement – "Concordato Preventivo"

The Preventive Agreement ("Concordato Preventivo") is described by art. 160 l. fall. This institution helps the distressed firm obtaining an agreement with creditors because, considering that the entire process is supervised by the court, it assures creditors more protective rights. The agreement with creditors have to be reached through a majority consensus, so the minority of creditors are actually dispossessed of their rights.

Bonfatti and Censoni (2013) clarify that this institution's goal is not only to resolve firms' crisis before the firms file for bankruptcy, but also to favor distressed firms restructuring and their going-concern. Basically, the firm stops its operating activities from the moment in which shareholders/entrepreneurs apply for using this institution; then, the court appoints a judicial commissioner who evaluates the firm's condition in order to check whether or not the firm possesses all the requisites to receive the Preventive Agreement. In fact, also for this institution there are prerequisites that have to be satisfied, and firm's accounting data as well as feasibility of the underlying restructuring plan have to be certified. The subjective prerequisite for applying to this tool, according to art. 160, co. 1, consists of the fact that only "shareholders/entrepreneurs which are in a crisis situation" can have access to this

institute, intended as the shareholders/entrepreneurs of a commercial company that might file for bankruptcy in the near future. The objective prerequisite is instead that, as described by art. 160 l. fall., the firm has to be in a "situation of crisis": this institution is no more restricted to firms in an insolvency condition, as the previous law provided, but its scope has enlarged.

The role of the judicial commissioner appointed by the court is crucial for the firm's destiny: in particular, his assessments and evaluations (that he usually presents in a written report) have a major effect on the creditors' voting preferences.

Bonfatti and Censoni (2013) also highlight that the Preventive Agreement is appropriate for whichever plan aimed at preventing/resolving/settling the firms' crisis situation, and this is because of the extreme versatility of usable instruments. In particular it can exploit the fact that, if the majority consensus of creditors (debts) is reached, then it is binding also for dissenting claim holders. Furthermore, it is the institution that, together with the Agreement with Firm's Going Concern, is able to bring crisis to light earlier, because through this instrument shareholders/entrepreneurs are induced to reveal crisis' signals early, so that they can enjoy more protective rights.

1.6.4 Agreement with Firm's Going Concern – "Concordato con Continuità Aziendale"

The Agreement with Firm's Going Concern ("Concordato con Continuità Aziendale") is a relatively new institution introduced in 2012 with art. 186-*bis* l. fall and it has became very popular nowadays as the tool most used in the case creditors want the firm to continue as a going-concern. This is because it is very similar to the Preventive Agreement in all its main characteristics but it also permits the firm to continue its operations while shareholders/entrepreneurs apply for this institution. Thus, it is a more "dynamic" tool than the Preventive Agreement because it allows the firm to keep going (as if it were not in financial distress) while dealing with the restructuring plan and bureaucracy (and their long time).

1.6.5 Bankruptcy Agreement – "Concordato Fallimentare"

The Bankruptcy Agreement ("Concordato Fallimentare") is described by art. 124 l. fall. Bonfatti and Censoni (2013) describe it as a tool to close more quickly the bankruptcy procedure: a debts restructuring (usually a debt reduction) is agreed with those creditors connected to the insolvent liabilities (according to precise majorities) and subsequently approved by the court. The Bankruptcy Law distinguishes legitimate subjects in two categories. The fist category includes the insolvent shareholders/entrepreneurs, one or more firms in which they own a stake (subsidiaries), one or more companies under common control (in respect of preceding one/ones): they can apply for this instrument only after one year has passed from the filing for Bankruptcy and after two years have elapsed from the administrative order which makes executive the liabilities. The second category instead comprises one or more distressed firm's creditors as well as any third parties: more importantly, with respect to the first category, they do not have the same strict temporal restrictions in order to apply for this institution. In all other characteristics the Bankruptcy Agreement is similar to the Preventive Agreement.

Interestingly, nowadays this institution is rarely used in practice because of its high degree of complexity, costs, time required to be completed.

1.6.6 Filing for Bankruptcy – "Dichiarazione di Fallimento"

The Filing for Bankruptcy ("Dichiarazione di Fallimento") is described by Title II, Chapter I l. fall. The Filing for Bankruptcy means that the company will cease to exist and all its assets will be sold separately in an auction, with the proceeds used to satisfy firm's creditors. The procedure formally starts with a declaration of Bankruptcy which can be filed by the debtor itself, creditors, or the public prosecutor (however, most of times it is filed by one or more creditors). As explained by Bonfatti and Censoni (2013), the insolvency condition is the objective prerequisite of bankruptcy (art. 2221 c.c. and art. 5 l. fall.) that is, shareholders/entrepreneurs find themselves no more able to regularly satisfy their own obligations. The subjective prerequisite consists instead of the fact that only shareholders/entrepreneurs of private commercial firms are subject to bankruptcy (art. 1, comma 1° l. fall.). The bankruptcy can be said to be actual and definitive if it is ruled in the council chamber (art. 16, comma 1° l. fall.).

To conclude, generally distress can be resolved through what we have defined as an asset restructuring (which corresponds to the Italian definition of "Liquidazione Ordinaria") or through a debts restructuring plan. The accomplishment of every tool provided by the Italian Bankruptcy Law is connected to the achievement of a deal with creditors: for those tools whose aim is firm's going concern, if the distressed company is not able to find a deal with claim holders, then it will be obliged to file for bankruptcy and all its assets will be sold separately in an auction in order to satisfy creditors.

1.7   Costs and benefits of distress

Whichever the tool used to deal with financial distress, the crisis will cause the firm some costs. In many cases the cost that firms pay for falling into financial distress is the highest and irrecoverable one: bankruptcy. Bankruptcy implies not only a loss of shareholder's net worth, since company cease to exist, but also loss of a job for many people, thus a general loss of wealth for the local community where the firm was established. For this reason, the Italian legislator provided for the previously described tools to resolve distress: they have been designed with the aim of safeguarding, as much as possible, the going-concern of the firm, thus also as many jobs as possible. In any case the company will have to bear some costs, which can also be judged as reasonable if the final result is the restoration of an economic and financial equilibrium for the firm. Altman (1991) makes a useful subdivision of the types of cost firms in distress will have to pay:

A. Out-of-Pocket costs or Direct costs;
B. Indirect costs.

Direct costs are all the quantifiable expenses firms have to bear while going through the legal procedures prescribed by law, both in the case of a turnover plan as well as in the case of company's liquidation: these include the costs for receiving aid from all the professionals and experts in the legal, accounting, and advisory fields. In addition, in the cases where firms are required to sell some of their assets to gain the necessary liquidity to continue the operations, usually the selling price companies earn is lower than the

market price they would have gotten if the asset had been sold in a normal/solvent condition. Furthermore, the selling price is even lower the quicker the sale has to be completed to gain liquidity. Financial distress might also cause the firm to incur higher production costs, e.g. a supplier can charge higher prices because unsure of the firm's ability to pay for the supplied materials, or to earn lower prices from the sale of its products (this is true for the Business-to-business – B2B – where the final retailer can take advantage of the firm's distressed condition to obtain significant discounts on the products).

Indirect costs are instead all non-measurable opportunity costs implied by the condition of financial distress. Although the fact that opportunity costs fall in the hypothetical ground, these costs can be relevant for a firm operating in a competitive environment, especially in the case the company will recover from distress: just think at the growth opportunities a firm could have made if it had not been financially constrained, the loss of market share it suffers in favor of other competitors, the investments in assets it could have made with the money spent for paying lawyers and accountants, the fall in products' demand due to customers worries about firm's going-concern, and so on. I would have considered also the time spent to deal with distress as another indirect cost, but Altman (1991) correctly points out that the time spent for restructuring the firm is not completely lost because the firm will benefit from the new implied strategic guidelines. With regard to this, I want to specify that this is true but only in the case the restructuring plan finally turns out to be successful.

Many have tried to quantify the costs of distress, however the results are very dependent on the legal scheme in force where the firm files for bankruptcy, the specificities of the concerned firm, and whether the valuation is made ex-ante or ex-post. Weiss (1990), from a sample of firms listed on the NYSE stock exchange, estimated direct costs to be on average 3,1% of the firm total value. Eckbo (2008) summarized that the interval of previous estimates for direct costs of distress is quite wide and generally ranges from 1% to 10%, in particular with medians that range from 2% to 6%. Andrade and Kaplan (1998) estimated the costs of financial distress to be between 10% and 20% of pre-distress firm value for highly leveraged firms. In this respect, Altman (1984) calculated that these costs, calculated on an ex-ante basis, would actually fall in between 11% and

17%. More recently, Almeida and Philippon (2007) calculated the costs of distress using risk-adjusted probabilities of default calculated from corporate bond spreads: for a firm with a credit rating of BBB, the NPV of distress is 4,5% of the pre-distress value; instead, without taking into account the risk premia the NPV falls at 1,4%. Davydenko et al. (2012) elaborated a model to derive the cost of default from the change in the market value of a company's assets at the moment of default: they estimated an average default cost of 21,7% of the market value of the firm's assets, with the cost reaching an upper limit of 30,5% for bankruptcies and on average reaching a 28,8% for investment-grade firms. In particular they also pinpointed that direct costs are relatively easy to derive and represents just a few percents of firm value; indirect costs are instead classified as more difficult to measure, but can also be much greater than direct costs.

However, most of people associates financial distress with negative facts, mainly because distress is a situation that creates tensions, uncertainty and costs, as we have just seen. However, distress might bring some benefits as well: in fact, because the insolvent firm finds itself at a crucial juncture where either it is able to come back to a normal state or it files for bankruptcy, distress is able to oblige the firm to make radical changes which otherwise would have never been made. Quoting once again Altman (1991), he distinguished between two types of major changes distress makes possible:

    A. Changes in management and governance;
    B. Changes in organizational strategy and structure.

Reorganization plans often entail the removal and substitution of the firm's managers and major changes also in the governance structure: that's because, if the firm has fallen in financial distress, significant faults usually lie in managers' incompetence as well as in a non adequate governance structure, unable to detect the causes of distress at earlier stages and fix them in due time. Furthermore, credit institutions often grant the distressed firm a second chance to continue its operations only provided that people they trust are placed in firm's key roles, e.g. in the board of directors. The other type of change distress usually implies is a radical change of the firm's strategy. Recall that financial distress is often coupled with economic distress, which is mostly caused by operational and/or strategic problems. When credit holders have to decide the firm's future, they evaluate reorganization plans that most of times prescribe a rationalization

of the firm's costs, a change in the business strategy as well as changes to the business model. These types of changes are very onerous in terms of time, skills and money required, that is why managers are reluctant to adopt these major changes when the company is in its normal course, or simply because managers might have not enough time to dedicate to strategic planning activities because immersed in day-by-day issues. In fact, it is not uncommon to read about big corporations making massive employee reductions or divesting some previously acquired companies only when they found themselves to "swim in very deep water".

2   Valuation methods for distressed companies

2.1   Introduction

In the last three decades the economic valuation of companies in distress has been a topic which had caused several debates, investigations and attempts in defining the most appropriate method, the one able to give out the most reliable value. However, it appears that some valuation techniques – with all their different modifications and technicalities – are more suitable for certain situations and to serve specific objectives, while others are more useful in other cases. When looking for valuation techniques suitable to deal with companies in distress, as well described by Buttignon (2015, pp. 2), "contributions have been … confined to stating only critical issues and proposing rather abstract solutions, seldom leading to real-world practices". This is due to the fact that this "niche" in the field of economic valuation of companies shows a series of critical features and difficulties which make the entire valuation process very complex and uncertain, since uncertainty is also the peculiarity of firms in distress. One of the most influent researchers who proposed applicable modifications and solutions to cope with the limits displayed by classic valuation methods has been Aswath Damodaran. The purpose of this chapter is neither to present the basics of the most widespread valuation methods nor to illustrate all the innumerable amount of technicalities and cavils which the most widespread valuation models can imply when applied to real case situations, but instead to give an overview of what are the issues and possible solutions that distress imply for the corporate valuation models. For an in-depth analysis of a specific method, the studies undertaken by corresponding previous practitioners should be looked at.

The illustration of the difficulties and critical subjects concerning the valuation process of distressed firms will take place in paragraph 2.2. Then, the pros and cons of the most famous corporate valuation methods with respect to their use in contexts of distress are discussed, and some possible solutions or alternative ways are presented. In addition, the presentation of each valuation technique has been performed in accordance with its final aim. In fact, when the value of a distressed firm's equity and assets in case of liquidation is required, asset approaches (paragraph 2.3) and option-pricing models (paragraph 2.4) are the most appropriate methods. Instead, when the objective of the

valuation is a restructuring or turnaround plan which assumes that the distressed firm will continue to operate in the future as a going-concern entity, income approaches –in particular the Discounted Cash Flow (DCF), Adjusted Present Value (APV), Capital Cash Flow (CCF) methods as well as the Monte Carlo techniques – and the market approaches – that is, the relative valuation models which rely on comparable firms and comparable M&A transactions – better fulfill the task: they are presented, respectively, in paragraph 2.5 and 2.6.

2.2 Critical subjects

The valuation of the economic capital of firms in distress presents unique characteristics and challenges which have to be explained before moving proceeding with the exposition of the techniques themselves:

A. As stated by Damodaran (2009, pp.1), "although the fundamentals of valuation are straightforward, the challenges we face in valuing companies shift as firms move through the life cycle". In particular, most of the valuation models have been developed for healthy firms with both positive growth and profitability margins: thus, when these methods are used to value firms in decline or distress, their application results challenging and may led to misleading results.

B. Whichever method of valuation an appraiser chooses to adopt, a technical computation that gives out a numerical value to a company cannot overlook what in many cases is even more important: the analysis of a firm's internal characteristics and of the external forces acting in the environment where the firm competes. Again, it is essential the application of some frameworks as the ones mentioned in the first chapter that is, the SWOT and the Porter's 5 Forces Analysis. In relation to the study of firm's internal and external environment, the analysis has to be aimed also at identifying what have been and currently are the main causes of firm's distress: only in this way stakeholders can assess whether proposed future plans are suitable or not.

C. The valuation of a distressed firm is inevitably correlated with the level of crisis in which the company currently is: Liberatore et al. (2014) pointed out that it is the seriousness of distress what determines the valuation method to adopt. Thus,

the choice of the model is also connected with the actual possibility of saving the company from the distress condition – in this context also falls the importance of analyzing the causes of the crisis.

D. The valuation of distressed firms is a very complicated "niche" in an already complex process. In fact, as highlighted by Liberatore et al. (2014), the economic value of a firm is the attempt to recap in a single value many underlying elements which are responsible for the entire value creation process. Thus, the valuation procedure is inevitably the result of a series of approximations and simplifications. In addition, the great level of uncertainty which surrounds a company in distress makes the valuation process even more difficult, since available information and data are usually quite scarce or unreliable. For these reasons, Liberatore et al. (2014) affirmed that every valuation technique is partial, incomplete: in fact, each one tends to focus on just a few of the myriad of features pertaining to a firm. It follows that, the best valuation model is not the most comprehensive one, but the least partial.

E. The uncertainty regarding the valuation of distressed firms is increased by what Crystal and Mokal (2006) called "strategic factors": these are due to the fact that holders of senior claims – that is, those who have priority claims with respect to the others claimants – have an incentive to undervalue the firm's business, while claimants who are in a low position of the priority ladder have an incentive to overvalue the business. The authors provided also an example to better explain this point. They considered a distressed company which is about to be acquired by a third party and subsequently to constitute a new entity with the acquirer: denoting the value of the distressed business as "X", if X is greater than the value of senior liabilities, then senior and junior claimants would both have effective rights against it, meaning that to both parties would receive shares in the new entity; however, in the case X is lower than the value of senior liabilities, only senior claimants would receive shares in the new company, making them end up with a greater net worth. Here is why senior claimants have an interest in demonstrating that the value of distressed firm is lower than what really is whereas junior claimants have the opposite objective. This theory was built also on the studies of Gilson et al. (2000): the researchers considered a

series of distressed companies which were implementing a process of turnaround and evaluated them using DCF and comparable firms' multiples, basing the projections on management's published cash flow estimates; then, they compared the obtained firms market value with the one computed by the firms themselves. They discovered very large differences in the compared results – in detail, a dissimilarity that ranges from less than 20% to more than 250% – which cannot be due to errors of estimation: the valuation discrepancies were obviously attributed to a lack of complete information about the firms, but most importantly to strategic biases associated with incentives of claimholders to distort the firm's value. Finally, the shortage of professional evaluations and assessments is another factor which exacerbates the uncertainty level surrounding the market value of distressed firms. In fact, as explained by Crystal and Mokal (2006), whenever a listed company falls into distress, fewer or no equity analysts are interested in studying and evaluating that company's share: basically, this happens because of a lack of incentives. In fact, analysts study a company and its share value in order to sell this information to some users that is, to people and institutions interested in acquiring its shares; however, when a company is in distress, there is little interest to trade that company's share or there are legal restrictions in doing so.

F. In the case of companies in "normal" economic and financial conditions, the valuation process is usually performed in a going-concern perspective that is, considering the firm as an entity that will continue its operations also in the future. However, in the case of companies in distress, the valuation can serve different objectives: in fact, in many cases several values are computed according to different perspectives which are subsequently compared. As already explained, a company in distress is in a pivotal period of its life-cycle, where irrevocable decisions have to be taken; but, since a company in distress is no more under the control of the shareholders/management, the decisions about the firm's near future pertain to its creditors. And credit holders usually consider many future options with regard to the distressed firm that is, valuations of the firm as a going-concern entity as well as in the case it ends its operations are considered. Then, according to the resulting value, distressed firm's creditors

choose the option underlying the valuation which provides the highest economic return compared to its realization possibility. Thus, the role that firm's economic valuation has for distressed companies is unique because it forms the basis on which creditors can take responsible and convenient decisions concerning the firm's future and their related capital. This was confirmed by Altman and Hotchkiss (2006): they stated that, unlike to what happens for healthy firms, the object of the valuation in a distressed context is typically not the equity, but rather the enterprise as a whole: thus, what is checked is the value created by all firm's assets as a result of a unique combination of all factors and forces affecting the firm's value creation process. This means that, distressed firms' stakeholders are usually more interested in the value created by firm's activities that is, by the underlying restructuring/turnover plan.

G. Focusing on the case where a reorganization/turnaround plan is considered, the plan has its basis on the estimation of the economic value of the restructured firm: thus, as highlighted by Altman and Hotchkiss (2006), corporate valuation becomes a critical subject also in the turnaround process. Altman and Hotchkiss (2006, pp. 103) continued saying that "The firm's estimated value determines the size of the pie to be divided among pre-bankruptcy claimants, and drives projected payouts and recoveries. It is also critical in determining the feasibility of the plan and in determining an appropriate capital structure for the reorganized firm".

H. Provided that plans and actions the firm has designed for the its future development play a critical role by forming the basis for the valuation process, these restructuring/turnover plans must in any case rely on some assumptions which are crucial for the valuation itself: in turn, these assumptions are subjective of the person who is conducting the valuation or are based on someone else's personal judgments or reports. In this respect, Liberatore et al. (2014) pointed out that the economic valuation of companies in distress have to be more cautious than that of other companies: what is meant is that the assumptions about future firm's development and all the related characteristics have to be particularly prudential and conservative, with the appraiser adopting the lowest value among those expected. The problem was recognized also by

Damodaran (2009) who stated that a common problem when valuing companies in decline is that of the appraiser being too much optimistic that is, he/she expects positive growth rates and higher returns for the distressed firm.

I. As stated by Damodaran (2009), valuing the enterprise value of a distressed firm is easier than valuing its equity: this is due to the fact that outstanding debt will inevitably vary throughout the time period considered in the valuation process, making the value of equity to change as well. Thus, the author suggested that the value of the outstanding debt should be calculated by trying to update it to its current market value, rather than just taking the last data available in the company's financial statements.

J. Lastly, a consideration must be made with respect to the possibility that firms in distress are subject to an M&A transaction. In fact, a company in crisis – despite the economic and financial difficulties which presents – might equally be seen by a third party as an interesting object that is, the company might have some unexploited capabilities or some unique assets which can provide a potentially high return if combined with another entity. Thus, as it is common practice in every M&A transaction, the distressed firm is analyzed and then valued in combination with another entity, implying that the synergies that may arise from the mentioned combination have to be identified and quantified. The particularity of the M&A transactions involving distressed firms is that the latter may represent a unique opportunity for interested third parties; equally, for distressed firms being merged or acquired may be economically more convenient than filing for bankruptcy. In fact, consider the case where the distressed firm is close to file for bankruptcy so it has no more time before his assets are sold in an auction: third parties can bargain a convenient price with firm's creditors if the deal guarantees a higher return than the other available options. It is known that a major drawback of M&A transactions is the high price that acquirers are obliged to pay to meet sellers' requests. However, in the cases concerning distressed firms, acquirers have the upper hand in the negotiation because:

a. It is the company in distress the party which needs funds or has to be saved, thus it may have limited time to spend in bargaining and it can be "forced" to accept lower offers;

b. The firm's destiny is no more in the hands of firm's shareholders but in those of creditors who may favor the success of a negotiation compared to what shareholders would do.

Thus, Liberatore et al. (2014) suggested that distressed firms should take an active role with respect to a possible M&A transaction: accordingly, a company in distress should actively search for a third party who can achieve valuable synergies with it, then the synergies should be quantified and effectively communicated to the possible interested third party. Garzella (2011) highlighted that the fact of having a clear idea about what are the possible synergies and opportunities a firm can offer to a potential acquirer can provide a way out of the crisis as well as contractual power in the eventual negotiation. However, in some cases it seems that a distressed firm's management team is so much surmounted by day-to-day problems and have to cope with such stringent difficulties that little or no time is left for activities which may prove useless as well: in fact, if the identification and quantification of the achievable synergies is already a long process when the interested acquirer is known, imagine when it has also to be identified. This view is supported by the findings of Hotchkiss and Mooradian (1998) who pinpointed that acquirers of bankruptcy firms are usually in related industries and have had some relationships with the target firm in the past. Thus, in their analyzed sample, bidders were usually quite informed about the value of target's assets and already know what to do with them: this is in contrast to the idea that the distressed firms should activate a signaling process in order to favor a possible future acquisition or merger, as envisaged by Garzella (2011) and Liberatore et al. (2014).

2.3   Asset approaches and firm's liquidation value

The asset or cost approaches establish the value of a firm on its balance sheet's items, that is on firm's assets and liabilities. As described by Gabehart and Brinkley (2002),

this type of approach provides for the adjustment of the book values of assets and liabilities recorded into the balance sheet to their respective fair market values. Although several techniques to implement the required adjustments have been devised throughout the years, Liberatore et al. (2014) outlined that asset approaches are almost always considered inappropriate both for valuation and strategic planning purposes. However, one of the few cases were asset approaches prove useful is the one concerning firm in crisis or in a turnaround procedure: in fact, these methods can provide aid in a turnaround process because they constitute the basis upon which to calculate the liquidation value.

In particular, the liquidation value is described by Guatri and Bini (2005) as the value of the firm as if it ends its operations, it sells all its assets into a public auction and, with the resulting proceeds, it satisfies the credit holders' claims: thus, it is in absolute discordance with the firm values resulting from going-concern plans and it serves as a benchmark measure. In fact, the two researchers described the liquidation value as the firm's limit-value, because it is not possible for the firm's value to assume values below it. Also Damodaran (2009) stated that it is common, when valuing a distressed or declining company, to assume that the firm will be liquidated and to study its liquidation value mainly as an alternative case or to supplement the DCF valuation. Furthermore, Liberatore et al. (2014) stated that the liquidation value helps distressed firm's stakeholders to answer the question of whether it is more convenient to liquidate or to restructure the company. In fact, the liquidation value is usually taken into account because, as explained by Crystal and Mokal (2006), the net present values of a firm in relation to plans conceiving it as a going-concern entity might be inferior than the value of all its assets as if sold separately in some auctions net of the existing liabilities. If this is the case, it follows that there are no reasons for the company to continue its operations, that the firm is no more viable: thus, the firm has to file for bankruptcy. Altman and Hotchkiss (2006) were on the same line of thinking stating that the liquidation value is a sort of lower bound: in fact, it is used to judge whether it is higher the value of firm's assets in going-concern ("alive") or in liquidation ("dead"). If the liquidation value is bigger than the going-concern value, liquidation is preferred. The two authors also stated that, in a liquidation analysis, each asset owned by the firm is valued according to the proceeds it is expected to generate in an hypothetical auction

sale, after having taken into account the expenses and fees associated with the sale. Then, after having collected credits and receivables, the net proceeds will be used to pay back creditors' positions: what is left is the net liquidation value. It follows that the value of firm's equity can be obtained with the following formula, derived from Damodaran (1994):

$$Value\ of\ equity = Liquidation\ value\ of\ assets\ (V) - Outstanding\ debt\ (D)$$

Conceptually, the liquidation value appears to be the most trustworthy appraisal in an highly uncertain context like that of a distressed firm, especially if this value is compared to going-concern plans based on a multitude of assumptions and future probable events: in fact, here the value of single assets is usually obtained through a comparison of how much similar assets are valued in the market. Liberatore et al. (2014, pp. 209) openly referred to the "objective verifiability of estimates" obtained through asset approaches. Furthermore, the authors continued stating that the reliability of the value resulting from a liquidation analysis has also increased in the last years and will do so even in the future because the use of the IAS/IFRS accounting principles in drafting firms' financial statements, with their tendency to substitute historical costs of assets and liabilities with their respective fair values, aligns the book value of balance sheet items to their relative market value, which is the one targeted in a liquidation analysis. However, Damodaran (1994) pointed out that the estimation of the liquidation value might be challenging when firm's assets are not easily separable and, for this reason, cannot be valued individually. Furthermore, the liquidation value is usually very different if it is the result of a planned or a forced liquidation. As described by Gabehart and Brinkley (2002), in the case of a planned liquidation, firm's assets are not sell all together in an auction but the sale occurs over time in an organized way so that each item is made available for inspection by potential purchasers and is ultimately sold with the aim of proceeds maximization; on the contrary, in a forced liquidation, there is not such a planned disposal of firm's assets but the sale occurs quickly and without an appropriate marketing effort. The result is that the forced liquidation value is evidently lower. The fact that the sale of bankruptcy firms' assets in auctions often takes place in an imperfect way was confirmed by Crystal and Mokal (2006): they underlined that those assets might be sold in a perfunctory manner that is, without appropriate

advertising and efforts aimed at attracting potentially interested acquirers, and with little interest in bargaining the best sale price. In addition, as highlighted by Altman and Hotchkiss (2006), the liquidation value is lower, the higher the specificity of assets or the smaller the secondary market for the assets.

Finally, it has to be considered that it is not always possible to liquidate a firm, even if it is more convenient from the point of view of creditors: as described by Guatri and Bini (2005), there might be significant social restrictions restricting the execution of the liquidation procedure (e.g. in order to prevent mass layoffs or consequences for related firms), the risk of unexpected costs, practical difficulties. Even when it is possible to file for bankruptcy and liquidate the company, additional costs have to be considered, such as some future net losses that the firm will have to be borne because necessary to continue the operations – although in a reduced way – while implementing the liquidation procedure, and some early retirement incentives.

From a more technical point of view, some modifications and adjustments have to be made to firm's financial statements in order to represent the value which an asset is expected to generate through an hypothetical sale. The required adjustments have been specified by Liberatore et al. (2014):

- The removal of those capitalized costs – e.g. R&D costs, marketing expenses, installation and expansion costs – which, without the going-concern assumption, have no more reasons to exist;
- The write-off of goodwill;
- The suspension of the depreciation and amortization process for tangible and intangible assets;
- The elimination of irrecoverable prepaid expenses;
- The conversion into debts or the removal from of balance sheet of provisions for future risks (since the company will cease to exist, taking into account the provisions for future possible events that are not going to take place is a nonsense);
- The definition of the provisions for future charges.

After having applied the mentioned adjustments, all assets in the balance sheet have to be expressed at their expected realizable market value, while all liabilities at their settlement value.

Finally, Damodaran (2002) noted that another asset approach is the so-called replacement cost. Differently from liquidation valuation, where assets in place are valued on the basis of what similar assets are priced in the market, the replacement cost obtain the firm value from what it would cost to replace all the current firm's assets.

2.4   Option-pricing models

As explained by Damodaran (1994), the so-called liquidation value approach illustrated in the preceding paragraph implicitly assumes that the market value of firm's assets is greater than the face value of current debts. However, it might not always be the case. Whenever the value of debts is instead higher than that of assets, the unique approach to value company's equity in a condition of distress is the adoption of option-pricing models. This is because, in such a context, the equity can be seen and valued as a call option on the distressed firm. We will now turn to the theory underlying this model, which derives directly from the work of Fisher Black and Myron Scholes.

Options are one of the many types of derivative instruments traded nowadays, especially in OTC markets. Black and Scholes (1973, pp. 637) defined an option as a "security giving the right to buy or sell an asset, subject to certain conditions, within a specified period of time". Accordingly, as explained by Damodaran (2002), a call option is an option which gives the right to buy a certain amount of an underlying asset at a specified price (the so-called strike price or exercise price) at or before the expiration date of the contract. And since the option entails a right to eventually buy and not an obligation, the holder can freely choose whether to exercise the right or let the contract expire. Obviously, the right granted by the call option has a purchase price. At this point, the author specified two possible future developments:

- The value of the underlying asset is lower than the strike price: in this case the call option is not exercised and the contract expires without a value.

- The value of the underlying asset is higher than the strike price: in this case the call option is exercised, with the difference between the current value of the underlying asset and the exercise price constituting the buyers' gross profit. The net profit is instead equal to the difference between the gross profit and the contract's purchase price.

As illustrated by Resti and Sironi (2007), the market value of an option is dependent on the following variables:

1. The strike price (X);
2. The market price of the underlying asset (S);
3. The residual maturity of the option contract measured as a fraction of a year (T);
4. The short-term risk-free interest rate (i);
5. The volatility (expressed as standard deviation) of the underlying asset price (σ).

In fact, the Black-Scholes pricing formula for a call option on a stock not entailing the payment of dividends is:

$$C = S * N(d_1) - Xe^{-iT} * N(d_2)$$

$$d_1 = \frac{ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right) * T}{\sigma * \sqrt{T}} \qquad and \qquad d_2 = d_1 - \sigma * \sqrt{T}$$

In particular, $N(d_1)$ and $N(d_2)$ represent the values of the cumulative normal density function that is, the probabilities that a variable with a standard normal distribution assumes values lower than d_1 and d_2.

Thus, the market value of a call option is actually dependent of four market factors, since the strike price can be excluded because fixed at the time the contract is stipulated. These factors have been explained in detail by Damodaran (2002):

1. *The market price of the underlying asset (S)*: movements in the price of the underlying asset directly affects the value of the call option. In fact, since a call option gives the right to buy the underlying asset at a pre-specified price, if the underlying asset's price increases the value of the call option increases as well.

1. *The residual maturity of the option contract measured as a fraction of a year (T):* the value of an option increases as the time period to expiration is larger. This is due to the fact that, in this way, the value of the underlying asset has more time to vary, a feature which add value to the call option itself.

2. *The short-term risk-free interest rate (i):* the purchase price of the contract option represents an opportunity cost for the buyer, which in turn depends on the level of the risk-free interest rate of a bond with the same maturity of the contract option. In particular, a higher value of the riskless interest rate is associated with a greater value of the call option.

3. *The volatility (expressed as standard deviation) of the underlying asset price (σ):* the higher the volatility of the underlying asset price, the greater the value of the call option. This is because the higher risk borne as a consequence of the higher volatility does not affect the buyer of the call option, since the buyer cannot lose more than the price originally paid for the contract option itself.

The question at this point comes naturally: what are the characteristics which make the firm equity similar to a call option? Damodaran (2009) underlined that, throughout the world, most publicly traded firms' equity capital has two characteristics in common: firstly, firm's shareholders (equity holders) can freely choose to liquidate firm's assets and settle non-equity claims whenever they desire to do so; secondly, shareholders enjoy a limited liability responsibility circumscribed to firm's assets that is, they have not to respond to firm's liabilities with their own private properties. These two features together make equity capital similar to a call option. Damodaran (2009) explained how, for a firm with a high level of indebtedness and a related high probability of default, the option value of equity can be higher than the equity value resulting from a going-concern valuation. Recalling what limited liability implies for equity holders, their return upon liquidation can be:

$$when \ V \geq D: \qquad \pi = V - D$$

$$when \ V \leq D: \qquad \pi = 0$$

$with \ \ V = Firm's \ liquidation \ value$
$and \ \ D = Face \ value \ of \ firm's \ outstanding \ debts \ and \ other \ non \ equity \ claims$

Thus, according to the point of view of distressed firm's shareholders, their equity capital can be seen as a call option on the company: if the call option is exercised, the company has to liquidate all its assets and settle all debts and non equity claims. Thus, the liquidation value of firm's assets represents the price of the underlying asset, while the face value of debts represents the strike price. Furthermore, the underlying asset is obviously the firm itself and the contract (call option) expires when the debt is due. The problem with the maturity of firm's debt is that firms usually have more than one liability, each one with a different expiration date. To resolve this issue, Damodaran (2009) proposed to estimate the duration of each debt obligation and then compute a face value from the weighted average of the several debts' durations: the resulting value will be used as the maturity of the option contract. Also the volatility of the underlying asset can entail some problems in its calculation: in fact, if normally it can be represented by the movements on firm's stocks or bonds, in a distress context stocks/bonds are more volatile and cannot be adequately informative. Damodaran (2009) came to our aid again specifying that, in such a case, it is preferable to use the average volatility recorded for other companies operating in the same industry. Figure 2.1 shows the payoff on call option (that is, on firm's equity).

Figure 2.1 – Payoff on call option (firm's equity)

Net Payoff on
call option (Firm's equity)

If asset value<strike price, you
lose is what you paid for the call

Strike Price
(Face value of firm's outstanding debts)

Price of Underlying Asset
(Liquidation value of firm's assets)
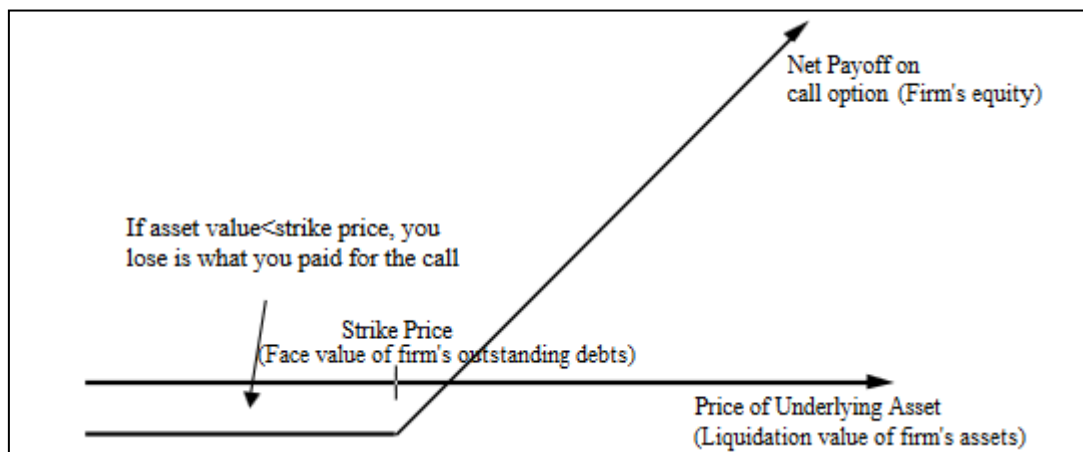
Source: Personal modification from Damodaran (2002, pp. 89)

Thus, Damodaran (2009) showed how a firm's equity has a value even though the value of all its assets is lower than the face value of its debts and similar claims: this is because, although the company is currently in a condition of distress, the feature of equity being like a call option gives the possibility to equity holders to have a return in

the case the future market value of assets will recoup becoming greater than those of debts.

A practical example, that follows the procedure illustrated by Damodaran (2009) of how to value a distressed company via option-pricing models will be now illustrated thereafter. Suppose that:

- The strike price (X) = Face value of debt = €75 million
- The market price of the underlying asset (S) = €60 million
- The residual maturity of the option contract (T) = 10 years
- The short-term risk-free interest rate (i) = 2%
- The volatility of the underlying asset price (σ) = 0,6

From the formulas displayed before:

$$d_1 = \frac{ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right) * T}{\sigma * \sqrt{T}} = \frac{ln\left(\frac{60}{75}\right) + \left(2\% + \frac{0,36}{2}\right) * 10}{0,6 * \sqrt{10}} = 0,936$$

$$d_2 = d_1 - \sigma * \sqrt{T} = 1,088 - 0,6 * \sqrt{10} = -0,961$$

$$Then \quad N(d_1) = N(1,088) = 0,8255$$

$$and \quad N(d_2) = N(-0,809) = 0,1683$$

Finally, the resulting value of the call (that is, the value of equity) is:

$$C = S * N(d_1) - Xe^{-iT} * N(d_2)$$

$$C = 60 * 0,8255 - 0,1683 * 75e^{-0,02*10} = € 39,1956 \; million$$

With a corresponding estimated value of the bond (outstanding debt) of:

$$D = S - C = 60 - 39,1956 = € 20,8044 \; million$$

As it can be seen, the equity capital of the distressed firm has still a positive value of € 39,1956 million even if the value of its assets in liquidation (= €60 million) is lower than that of its outstanding debts (= € 75 million): this is because it is valued the possibility that the distressed firm recovers from distress and returns to a normal condition of profitability.

To recap, in order to calculate the value of the firm upon liquidation, two different approaches are possible, according to the characteristics of the firm in distress and in particular to the liquidation value of its assets (V) and to the value of its outstanding debts (D):

- If $V \geq D$, the value of equity of the distressed company is equal to the difference between the two values, after having adopted a series of modifications illustrated in paragraph 2.3;
- If $V \leq D$, the value of equity of the distressed company can be quantified only through the use of the option-pricing models, whose procedure has been described here in paragraph 2.4.

2.5 Income approaches

Some of the most used corporate valuation approaches are those which base the firm value on the results of company's operations or, as defined by Gabehart and Brinkley (2002), on firm's income-generating ability. The income approach can be subdivided on a series of different models according to what is considered the relevant measure of income. In details, an appraiser can choose among a wide range of operational results that is, from very simple measures of income to very complex and detailed ones. Gabehart and Brinkley (2002) specified a series of measures of income, which have been described below in a increasing order of complexity and of required detail needed for the computation and projection into the future:

- Gross revenues;
- Gross profit;
- EBITDA;
- EBITA;
- EBIT;
- Normalized income;
- FCF.

It is clear that the choice of the income measure in income approaches is critical for the final result of the valuation process: for healthy firms it appears that more detailed measures of income are preferable and the ones more used. In any case, Gabehart and Brinkley (2002) underlined that the heart of income approaches stays in the in-depth analysis and evaluation of a firm's historical, thus in the company's expected future ability to generate an income stream in consideration of the risks firm's operations entail for the providers of capital.

For what concerns the choice of the income measure when valuing companies in distress, an interesting study by Joseph and Lipka (2006) studied whether or not some accounting information are useful in a model which associates a distressed firm's stock prices with some performance indicators. The usefulness of these accounting information was tested from the beginning of the distress until the bankruptcy declaration or liquidation. The considered measures of performance were: earnings, cash flows and accruals. The data show that, while cash flows are more useful than earnings, their informative power diminishes as the operating problems arise. Instead, the usefulness of accruals remains the same, in stark contrast with the belief that their value decreases as the distress get worse. Instead, the studies of Liberatore et al. (2014) and Massari and Zanetti (2008) view the income approaches based on cash flows as barely applicable to distressed firms. In fact, these approaches are dependent on several assumptions concerning investments and financing policies which have a great impact on the resulting cash flows: the problem is that, in a context of distress, these assumptions are difficult to correctly estimate because they usually divert greatly from historical data, making them less trustworthy. Thus, Liberatore at al. (2014) considered the EBITDA, EBIT and Net Income as more objective, because less dependent on the just mentioned assumptions. However, the authors stated also that a very critical fact about cash flows is that the latter are more able to describe all a series of underlying characteristics of the firm, enabling a more in-depth analysis. Furthermore, especially because a distressed firm, in the case it undertakes a restructuring/turnover process, will or at least is supposed to completely renew its strategy and business model, its expected results have to divert from the historical ones in order, for the turnaround strategy, to be successful. Thus, we have judged income approaches based on cash flow measures to be not completely accurate in estimating future projections – unless the appraiser has

access to detailed information about firm's investments and financing policies – but in any case necessary for the valuation of a distressed firm's turnaround strategy, since the latter must represent a breaking point with respect to the past.

2.5.1 Discounted Cash Flow models

A particular class of income approach is the Discounted Cash Flow (DCF) technique which, together with the relative valuation models, is one of the most widespread methods of corporate valuation. As described by Koller et al. (2010), with the DCF approach the value of a company is built on the expected flows of income the firm is expected to earn in the future. And since it requires the computation of the future cash flow stream, accurate projections and related assumptions are needed, which in turn should be based on an in-depth analysis of the firm and its competitive environment. In fact, as pointed out by Altman and Hotchkiss (2006), the DCF methods oblige the appraiser to make critical assumptions to derive the required cash flows and the discount rates. However, due to the amount of data that DCF methods need in order to return a measure representative of the firm value, Borsa Italiana (2004) described it as the most reliable valuation method of the corporate theories that link the value of a company to its ability to produce cash flows bigger enough to satisfy the investors' required return. On the same line of thinking Damodaran (2002) stated that DCF valuation is the foundation on which all other methods of valuation are based: in fact, in order to apply the other methods, first and foremost the basic principles of the DCF must be understood. The author explained that the DCF relies on the present value rule, according to which the value of any asset is equal to the present value (PV) of expected future cash flows: in particular, the value of future cash flows is actualized via a discount factor, which takes into account the risk related to the corresponding cash flows. In general, the DCF formula for the Enterprise Value (EV) is:

$$EV = PV(cash\ flows\ in\ the\ explicit\ period) + PV(TV)$$

The TV in the above formula is the Terminal Value that is, the value of the firm after the period non-explicitly considered – in any case derived from a perpetuity based on

the expected cash flows in the year after the last one considered in the explicit period of projections.

Altman and Hotchkiss (2006) stated that the most widespread DCF model is the one that discount back to the present the firm's free cash flows (FCF): the latter are the after-tax cash flows produced by the company available to all its claimholders. Alternatively, as described by Koller et al. (2010), are the cash flows generated by the business's core operations after deducting investments in new capital. Damodaran (2002) call them FCFF, and are defined as the sum of the cash flows to all claimholders in the company, including shareholders, preferred shareholders and debt holders; furthermore, since flows of cash related to debt are not considered, FCFF are also called unlevered cash flow. The implied formula is:

$$FCF \ or \ FCFF = EBIT * (1 - tax \ rate) + Depreciation - CAPEX - \Delta Working \ Capital$$

Damodaran (2002) distinguished FCF or FCFF from free cash flow to equity (FCFE), which are the cash flows generated by the company available only to its equity holders; the implied formula is:

$$FCFE = Net \ Income - (CAPEX - Depreciation) - \Delta Working \ Capital$$
$$+ (New \ Debt \ Issued - Debt \ Repayments)$$

However, focusing back to the DCF models based on FCF (or equivalently FCFF), these cash flows have then to be discounted back to the present at the weighted average cost of capital (WACC) that is, the mixed average rate of return all providers of capital require. Altman and Hotchkiss (2006, pp. 109) referred to the WACC as the "rate that reflects all investors' (both debt and equity) opportunity cost for investing in assets of comparable risk". The well-known formula for the WACC is the following one:

$$WACC = k_d(1 - t) * \left(\frac{D}{EV}\right) + k_e * \left(\frac{E}{EV}\right)$$

In detail, k_d and k_e are respectively the cost of debt and equity capital; variable t represents instead the marginal tax rate of the firm; $\frac{D}{EV}$ and $\frac{E}{EV}$ are the ratio of the market value of debt and equity capital with respect to the EV.

The last input in the DCF models is the terminal value (whose meaning has been explained earlier): its computation is very critical because usually it constitutes the major part of the overall EV. In fact, as highlighted by Altman and Hotchkiss (2006) referring to the studies of Gilson et al. (2000), the terminal value is responsible for approximately 70% of total EV in firms undertaking a restructuring/turnover plan. The two researchers continued stating that two methods are commonly adopted for deriving the TV:

i. A comparable company approach (for example a multiple of EBITDA is applied to the forecasted cash flows in the year after the end of the explicitly projected period).

ii. A growing perpetuity formula based on a normalized long-term assumptions:

$$TV = \frac{FCF_{t+1}}{WACC - g}$$

Variable g reflects the expected growth rate of cash flows in perpetuity, while t is the last year explicitly forecasted. Despite its obviousness, it is worth noting how even a minor change in one of the variables constituting the perpetuity formula will have a huge impact on the terminal value: accordingly, the underlying assumptions must be carefully analyzed.

It has been already revealed that DCF models can rely on different cash flows measures. In fact, nowadays are available several different DCF models to value a company, models which Damodaran (2002) categorized into three groups:

a) DCF methods which value just the equity of the firm
b) DCF methods which value the firm as a whole
c) DCF methods which value each part constituting the firm

Thus, the three classes of procedures are different in what they consider the relevant cash flows and discount rates. Before analyzing each category in details, it should be noted that they eventually lead to the same firm value if used in a consistent way that is, if computed under the same assumptions and with the use of the correct discount factor for each cash flow measure. Below, each category of DCF methods will be described following the studies of Damodaran (2002).

For category a), the value of firm's equity is obtained through the discounting of each cash flow to equity expected at time t (with cash flow to equity defined as the cash flows remaining after all expenses, new investments, taxes and debt payments) by the corresponding cost of equity k_e (which is the rate of return investors require to invest in the firm's equity capital). Thus, these DCF models value directly the firm's equity.

$$Firm's\ Equity\ Value = \sum_{t=1}^{t=n} \frac{CF\ to\ Equity_t}{(1 + k_e)^t}$$

For category b), the value of firm as a whole is the result of the discounting of each expected cash flow to the firm at time t (with cash flow to the firm defined as the cash flows remaining after all operating expenses, new investments and taxes) by the corresponding weighted average cost of capital (the $WACC$ is the average rate of return equity and debt investors require to invest in the firm's capital, weighted for their respective proportions expressed at market value). Thus, the value of the underlying asset responsible for the future income generation is estimated in whole.

$$Firm's\ Value = \sum_{t=1}^{t=n} \frac{CF\ to\ Firm_t}{(1 + WACC)^t}$$

For category c), the value of the company is obtained after each component of the firm value had been considered and valued singularly: this approach is called Adjusted Present Value (APV) and will be scrutinized in the next paragraph (2.5.2).

In this respect, Liberatore et al. (2014), comparing different valuation techniques, stated that DCF models who compute firm value by calculating, firstly, the value of firm's assets (the so-called EV) and then subtracting from this value that of the net financial position (NFP), allow for a greater elasticity on the computation perspective, a feature which can prove very useful when valuing distressed companies. In fact, by valuing different items separately (such as the value of core assets, non-strategic assets, debts and similar claims), each part can be subject to different assumptions and valuation models, thus to a different level of detail. It follows that these DCF models permit also the valuation of a firm according to its single strategic business units (SBUs).

Analyzing the suitability of DCF methods for the valuation of companies in distress, the words of Koller et al. (2010) come to our aid: in fact, they stated that, by valuing a company through DCF models based on a constant WACC, the appraiser is implicitly assuming that the firm targets a specific debt-to-value ratio. The problem is that, although in most situations debt increases alongside firm value, whenever a company has planned to change its capital structure in the near future (this is the case of companies in distress or under a restructuring/turnaround plan), it will decrease its debt exposition as the profitability level improves, lowering its debt-to-value ratio: thus, a valuation founded on a constant WACC would overestimate the related tax shields. The appraiser can calculate a WACC for each future forecasted year, but the computation is quite complex. Also Damodaran (1994) offered a reflection on companies that are undertaking a restructuring process that is, those firms which are selling and/or acquiring assets as well as changing their capital structure: this context makes the estimation of future cash flows very challenging, also in consideration that changes in the capital structure imply a different risk profile for the firm, thus a different cost of capital. However, valuation is possible provided that the changes in investments and financing policies, as well as the associated variations in discount rates, are all reflected in the future cash flows. Damodaran (1994) analyzed that, in general, DCF valuation has been designed for companies whose cash flows are positive and can be reliably projected into the future, as well as whose underlying business risk can be appropriately quantified. Accordingly, for firms with negative earnings and cash flows, and which are also expected to "burn" money for some time in the near future, estimating cash flows is difficult because of the underlying probability of default. Thus, the DCF method seems not to be the proper solution, since it works under the going-concern assumption. Furthermore, Damodaran (1994) added that, even if the company is able to survive, cash flows have to be forecasted until they reach a positive value: this is a critical prerequisite for the application of the DCF method, since negative cash flows imply a negative value for firm's equity capital. Thus, some modifications to the classic approaches are needed. Damodaran (1994) underlined that the valuation of firms in financial distress depends on how serious the crisis actually is. If distress is not expected to lead to bankruptcy, several potential solutions or adjustments can be adopted, such as:

- Value the firm, not the equity: the valuation of firm using the Free Cash Flow to Firm (recall that the FCFF are the cash flows remaining after all operating expenses, new investments and taxes), which does not consider debt payments, makes the appraiser avoid all problems related to the high level of leverage or the negative Free Cash Flow to Equity (FCFE).

- Use normalized/average earnings: base the valuation on the normalized/average earnings of the period when the company was not in distress.

- Forecast detailed cash flows for the period of transition: the author defined the transition period as the interval of time needed by the company to overcome distress and return to normal conditions. Accordingly, DCF is feasible if it is possible to define the transition period and derive a detailed computation for the future cash flows.

However, Damodaran (2002) subsequently underlined that the likelihood of failure of a firm in trouble must be taken into account in the valuation process. Accordingly, a general solution implies that the discount rates associated to expected cash flows should be higher in a way to decrease the resulting present values. While these adjustments are appropriate for firms with a low probability of distress, they are not considered adequate to represent the probability of failure of firms in serious trouble: in fact, in case of bankruptcy, a firm would be able to generate neither the expected smaller cash flows implied by the higher discount rates nor the forecasted terminal value. Thus, Damodaran (2002) proposed to apply a discount to the firm value in a way to account directly for the possibility that the firm will not survive in the near future: one way to calculate this discount is to use the "cash burn ratio" (defined by Damodaran as $\frac{Cash\ Balance}{EBITDA}$) to forecast a probability of failure and adjust the DCF value resulting from operating assets for this probability.

$$Adj.Value = DCF\ Value_{operating\ assets} * (1 - \pi_{distress}) + Distressed\ Sale\ Value * (\pi_{distress})$$

Where $\pi_{distress}$ is the probability of distress/bankruptcy, whose possible derivation techniques will be illustrated later in this paragraph. In respect to the above illustrated formula, Damodaran (2002) explained that the loss of value is not attributable directly

to the failure of survive in its strict sense, but to the fact that the distressed sale value is worth less than what would be in normal conditions.

More recently, Damodaran (2009) has further deepened the concept of distress in relation to discounted cash flow models. He specified that distress may not be considered in the DCF models if any of the following conditions are met:

A. It is impossible that the firm will file for bankrupcty;
B. The firm, despite the distress situation, is still and will continue to be able to find new sources of financing, thus actually avoiding the possibility of a future liquidation sale;
C. The adopted DCF model has estimated future cash flows which already include the probability of bankruptcy and a discount rate adjusted for the effects that distress has on the underlying business risk. Furthermore, it has been assumed that the proceeds in the case of a liquidation sale are equal to the present value of firm's expected cash flows valued as a going-concern entity.

If these conditions are not met and distress has not been taken into account in the DCF valuation, the resulting firm value will be overestimated. Thus, Damodaran (2009) proposed 3 different ways to account for distress into a DCF model:

1) *Simulations*: make use of simulations to consider the effects of distress. In fact, the forecast of firm's cash flows is usually based on the hypothesis that key value drivers will assume specific values in the future; however, the key value drivers can actually assume any value and not just the ones assumed to run the projections. Thus, the use of simulations, and in particular the Monte Carlo simulations, solve this problem: the topic will be analyzed in detail in paragraph 2.5.4.
2) *Modified Discount Cash Flow valuation*: modify the DCF model in a way that both forecasted cash flows and associated discount rates consider distress explicitly. In detail, include the probability that the company will file for bankruptcy into the annual expected cash flows and develop different future case scenarios, assigning to each one a corresponding probability of occurrence. The resulting expected cash flow in each year will be:

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

Where π_{jt} and $Cash\ flow_{jt}$ represent, respectively, the probability of case scenario j in period t and the corresponding cash flow.

For what concerns the discount rates, estimate the cost of equity by using what the author defined the "bottom-up unlevered beta" and the firm's current debt-to-equity ratio at market values, according to the following formula:

$$Levered\ Beta = Bottom\ up\ Unlevered\ Beta * \left(1 + (1 - tax\ rate)\right) * \left(\frac{D}{E}\right)$$

Alternatively, the cost of equity can be approximated by the beta of a non-distressed firm in the same industry adjusted with an extra premium to reflect the situation of distress, according to the formula:

$$k_e = r_f + \beta_{Healthy} * ERP + Distress\ Premium$$

With r_f that is the interest rate of a riskless instrument while ERP is the equity risk premium. Distress premium can be obtained from the historical data on the rates of return earned by investing in the equity capital of distressed companies.

Turning the attention to the cost of debt for a firm in distress, use a default spread built on the bond rating of the firm:

$$Cost\ of\ debt\ (before\ taxes) = r_f + default\ spread$$

The author clarified that, if the company has not any bond traded on the market, a "synthetic rating" can be estimated: although the resulting cost of debt may be high, this will be more appropriate to discount future cash flows in consideration of the current state of distress.

Finally, to compute the cost of capital, the evolution of the debt-to-equity ratio must be estimated. A conventional practice is to make the capital structure targeting a specific debt-to-equity ratio (usually the industry average or the optimal ratio): this can be a solution, provided that the target capital structure is expected to be achieved in a reasonable time period with respect to the current condition of the firm. If this is not the case, adjust the capital structure in relation to the evolution of the firm's profitability level.

3) *Treat distress separately*: an alternative method considers the effects of distress separately from the calculation of firm's cash flows, according to the formula:

$Firm\ value = Going\ concern\ value * (1 - \pi_{distress}) + Distressed\ sale\ value * \pi_{distress}$

Again, $\pi_{distress}$ is the cumulative probability of distress/bankruptcy over the considered valuation period, with the author who specified that this probability can be estimated though 3 approaches:

i. *Statistical approaches*: these compute the probability of bankruptcy from a series of firm's characteristics (e.g. usually the firm size, its level of leverage, its cash balance, its profitability, etc.), in particular by comparing them with the ones of companies which have filed for bankruptcy in the past. One of the models based on this procedure is the Z-score developed by Altman, which was already illustrated in paragraph 1.4. The problem is that such models do not return a probability of distress directly: thus, Damodaran (2009) explained that a *probit* can be used. Accordingly, a variable which can only assume either the value of zero or one is develop, such as:

$Distress\ dummy = 0 \qquad\qquad for\ any\ firm\ which\ has\ survived$

$Distress\ dummy = 1 \qquad for\ any\ firm\ which\ has\ filed\ for\ bankruptcy$

The dummy variable must be considered as the dependent variable, while the characteristics able to distinguish between firms which has survived and firms which has gone bankrupt must be considered as independent variables (x_i). Then, it must be used the following relationship:

$$Distress\ dummy = a + b * x_1 + c * x_2 + \cdots + n * x_n$$

Where variables a, b, c etc. are the weights assigned to each discriminating characteristic. Finally, if the relationship proves statistically and economically significant, the probabilities of bankruptcy can be derived.

ii. *Built on bond rating*: the probability of bankruptcy is related to the bond rating of the firm and the corresponding default rate calculated upon the firms in the same rating class which have filed for bankruptcy in the past. In fact, many firms have issued bonds to which credit ratings have been attached by rating agencies: accordingly, the cumulative probability of default can be derived by the default rate of firms which have had the

same rating class in the past. Recall that, if the company has not any bond traded on the market, a "synthetic rating" can be estimated.

iii. *Built on bond price*: the prices of bonds which the firm has issued are used to deduct firm's probability of bankruptcy. In order to value the bond, the author specified that its expected cash flows have to be lowered to account for the underlying probability of distress, and have to be subsequently discounted at the risk-free interest rate. Assuming a fixed annual probability of bankruptcy, the price of a bond with a constant coupon which matures in N years would be:

$$Bond\ price = \sum_{t=1}^{t=N} \frac{Coupon(1 - \pi_{distress})^t}{\left(1 + r_f\right)^t} + \frac{Bond's\ face\ value(1 - \pi_{distress})^N}{\left(1 + r_f\right)^N}$$

Finally, the resulting bond price can be compared with the price of a firm's issued bond to calculate the probability of bankruptcy of the firm itself.

Focusing back to the firm value, to calculate the value of the firm under the assumption of going-concern, only the scenarios where the company survives have to be considered; instead, the distress sale value can be approximated by the liquidation value. Alternative methods to estimate the expected proceeds in the case of a distress sale are:

i. Assume the distress sale proceeds to be a percentage of the going concern value (usually less than 100%);

ii. Compare the distress sale proceeds to what the expected cash flows in going-concern would be if there was not investments in assets in the future (that is, as if only assets currently in place were responsible for the value generating process).

iii. Consider the distress sale proceeds to be a percentage of the book value of assets, according to the historical data of firms who filed for bankruptcy in the past.

An alternative method of valuation based on the DCF and option pricing models was also proposed by Buttignon (2015), a method that can be used for distressed firms which are considering to undertake a reorganization plan. In particular, the suggested valuation process is the following:

a) Analyze the firm's historical financial statements up to the date of the valuation in order to understand firm's current situation that is, the causes of distress;

b) Revise the actions and projections implied by the reorganization plan, and compare them with the findings of point a) in order to check whether or not the reorganization plan can actually take the firm out of distress in the future. It is important that the reorganization plan's expected results are estimated for different case scenarios.

c) Estimate the firm's EV, also in consideration of the different case scenarios which the reorganization plan has developed in order to reflect the uncertainty of the context. In particular, for what concerns the explicit period of projection, the FCF should be discounted back to the present at the unlevered cost of capital, with expected tax benefits coming from debt that should be calculated separately; instead, for the CV, the WACC can be used provided that the firm will target a realistic capital structure. Thus, once the BEV has been calculated, the EV can be obtained by simply adding non-operating assets.

d) Calculate the debt value, which have to be based on the reorganization plan's expected cash flow for the remuneration and repayment of creditors (the so-called FCD, cash flow to creditors) and on the different case scenarios developed – the same built for the EV;

e) From the EV and the value of debt (as well as the minority interest), compute the equity value which, if approved by firm's creditors, benefits from the possibility of achieving EV and could take advantage of the reduction in debt value.

The particularity of the approach is contained in part d), where the value for firm's creditors is based on FCD that can be estimated through DCF or option pricing models. Buttignon (2015) highlighted how, for a firm into distress, its NFP at the date of valuation has a face/nominal value that is usually lower than its economic/market value, thus it cannot be used as a benchmark for the latter. In turn, the author proposed two ways to shift from the nominal to the economic value. One of the two possible procedures is based on the options pricing theory, while the other makes use of a DCF model which returns the fair market value of debt by discounting forecasted cash flow to creditors (FCD) – as provided in the reorganization plan – at their corresponding

market cost of debt. As concluded by Buttignon (2015), the DCF model for the estimation of the value of risky debt is easy to implement, since it is built on the cash flow to creditors forecasted in the plan (FCD), with the only difficulty that relates to the estimation of the market cost of debt (for further details see the author's work).

2.5.2   Adjusted Present Value approach

As already anticipated, this approach is an alternative corporate valuation method that disaggregates the firm's value into several components, thus it has the unique characteristic of marking possible the discount of different cash flows to the firm by different discount rates, according to their corresponding riskiness. Altman and Hotchkiss (2006) specified that this approach originated from the investigations carried out by Modigliani and Miller (1958 and 1963) which focused on the relationship between the capital structure of a firm and its true/intrinsic value. In a first place, Modigliani and Miller (1958) stated that a firm's capital structure has no influence on its value, with the only capability of generating future income as the relevant variable in that respect. However subsequently, Modigliani and Miller (1963) themselves revised their previous statement: they instead underlined how tax benefits from debt interest payments are correlated with the firm's value. As stated by Altman and Hotchkiss (2006, pp.130), "they reasoned that a firm could indeed lower its capitalization rate and increase its value by adding debt and receiving a bonus equal to the tax rate times the amount of debt (TD)". The reasoning is shown in figure 2.2 below.

Figure 2.2 – Effects of leverage on firm's value
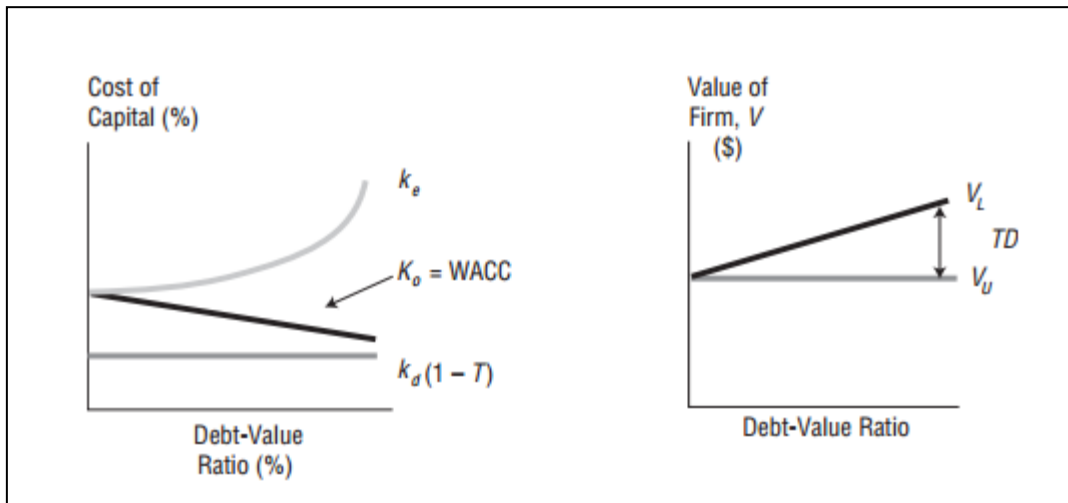
Despite several modifications and critics to the works of Modigliani and Miller have been developed in the subsequent years, the concept at the hearth of their studies gave rise to the Adjusted Present Value approach. According to Altman and Hotchkiss (2006) this approach compute the total EV as the sum of the value of operating assets generated from the firm as if it had no debt and the present value of tax shields from debt interest payments; in particular, tax shields can also account for more complex tax shields as the net operating losses (the so-called tax loss carry-forwards).

$$Value_{firm} = Value_{Firm,no\ debt} + PV(debt\ tax\ shields)$$

$$= \sum \frac{FCF}{1 + WACC_{unlevered}} + \sum \frac{Tax\ shields}{1 + r_{Tax\ shields}}$$

As specified by Liberatore et al. (2014), in order to calculate the FCF, a pre-established tax rate is applied directly to the EBIT, one which do not account for the tax deductibility of interest payments on debts and other non-operating activities: in this way the effect of the firm's capital structure is isolated. Finally, the equity value of the firm is obtained by deducing from the EV the value of the firm's NFP.

Altman and Hotchkiss (2006) pinpointed how there are a series of specific issues related to companies in distress that make the APV method more suitable for corporate valuation in these contexts. In particular, the ease of application with respect to other methods when the capital structure is expected to vary significantly during the projected

period; furthermore, the APV approach is more appropriate to cope with complicated tax situations, as in the case of distressed firms which are undergoing a restructuring process. Koller et al. (2010) were on the same line of thinking stating how market imperfections (e.g. taxes and distress costs) has a significant impact on enterprise value, making the APV approach best suited situations in which the firm has planned to make major changes to its capital structure: in fact, in these cases the DCF models based on a constant WACC cannot be judged as informative of the true risk of the business, since the WACC assumes the company adapts its debt to EV ratio to a target level. In particular, using a constant WACC would overstate the resulting projected tax shields. The formula proposed by Koller et al. (2010) is:

$$APV = EV_{Firm\ all\ equity\ financed} + PV(tax\ shields)^*$$

However, they pointed out that, in general, the APV takes into consideration any incremental values associated with the capital structure: tax shields, security issue costs, bankruptcy costs. For what concerns the value of the company as if it was all-equity financed, the authors explained that future FCF have to be discounted at the unlevered cost of equity, which represents the cost of equity if there were no debt capital. A more detailed formula for the APV approach has been developed by Damodaran (2002):

$$Firm's\ value = Value\ of\ the\ firm_{Unlevered} + PV(tax\ benefits) - Expected\ Bankruptcy\ Costs$$

Accordingly, firstly the firm's equity has to be valued as if the company was only equity financed; then, it must be summed the value – presumably positive – added by debt via the consideration of the present value of the tax shields realized because of the tax deductibility of interest payments on debt, while it must be deduced the expected distress/bankruptcy costs. Thus, with this formula both benefits and costs of borrowing are considered: in fact, the most valuable and quantifiable benefit of debt is the tax benefits that it implies, while the highest possible cost of employing debt capital is bankruptcy.

Now we will go through all the three steps required to derive the firm's value according to the APV approach as conceived by Damodaran (2002). The first step is to value the firm's operations as if their sources of financing are composed only by equity claims: any formula for the EV value can be used provided that the FCFF (recall they represent

the cash flows remaining after all operating expenses, new investments and taxes) – in addition to be based on assumptions reasonable for the current state of the firm – are discounted back to the present by the unlevered cost of equity. In greater detail, the variables you need in this step are the unlevered cost of equity, expected cash flows and the growth rates. With respect to the calculation of the unlevered cost of equity, its calculation might prove challenging.

As explained by Koller et al. (2010), the problem is that the unlevered cost of equity cannot be directly observed, since only the variables related to debt and equity can be derived through the use of market data. In fact, the researchers continued that the cost of equity as well as that of debt can be derived through the use of the Capital Asset Pricing Model (CAPM), which postulates that the expected rate of return an investor requires for investing in any security is equal to the riskless interest rate plus the beta of the security multiplied by the market risk premium:

$$E(R_i) = r_f + \beta_i [E(R_m) - r_f]$$

With: $E(R_i) = expected\ return\ of\ security\ i$

$r_f = interest\ rate\ of\ a\ risk\ free\ instrument$

$\beta_i = security's\ sensitivity\ to\ the\ market$

$E(R_m) = expected\ return\ of\ the\ market$

Accordingly, the unlevered cost of equity can be obtained in the following way:

$$k_u = r_f + \beta_u * MRP$$

Thus, in order to obtain the unlevered cost of equity it must be firstly calculated the unlevered beta of the firm, β_u. As explained by Koller et al. (2010), the variable β quantifies how much the security and the market move together. Damodaran (2002) proposed the following formula for computing the unlevered beta of the firm:

$$B_{unlevered} = \frac{B_{current}}{1 + (1-t) * \frac{D}{E}}$$

Where $B_{current}$ is the current firm's beta of equity, while $\frac{D}{E}$ is the market debt to equity ratio. Koller et al. (2010) instead followed directly the works of Modigliani and Miller suggesting the formula:

$$k_e = k_u + \frac{D}{E}(k_u - k_d)$$

Where k_e and k_d are respectively the firm's cost of equity and debt. However, whichever method an appraiser uses for obtaining k_u, in the cases of firm currently in a situation of distress, specific difficulties arise also in the calculation of the required variable. Among the many issues, some of these are:

- The $B_{current}$ or equivalently B_e, for healthy firms can be reliably measured by regressing the security's return against the market's return: however, in the case of firms in distress, their security are usually highly volatile and the regression can lead to misleading results. That is why Koller et al. (2010) suggested to use the β calculated on industry comparables.

- The k_d, according to Koller et al. (2010), for investment-grade firms can be estimated by using the yield to maturity of the company's long-term, option free bonds. However, for below investment grade companies (as it is often the case of companies in distress) the use of the just illustrated method can cause significant error. In addition, many firms do not have bonds traded on the market. Furthermore, the cost of debt cannot be simply represented by the interest rate paid on past debts, as also highlighted by Pignataro (2013). However, in this respect, Damodaran (2002) proposed to check if the company under valuation has recently borrowed some funds from financial institutions and in case use the related information – only if they are still appropriate to represent the current situation of the firm – to estimate the cost of debt. Another possible solution developed by the researcher is to build a model which is in turn based on the estimation of the so-called "synthetic ratings". Accordingly, the credit rating of a particular company can be estimated by taking in consideration its financial characteristics. In particular, a credit rating is attributed to the company as if it had sold some bonds into the market: thanks to this procedure, a

default spread related to the firm's probability of default is assigned to the company itself. The cost of debt can thus be calculated in the following way:

$$K_d = r_f + Company\ Default\ Spread + Global\ Default\ Spread$$

Once the unlevered cost of equity has been derived, the future FCFF can be discounted back to the present: the resulting value is the value of the unlevered firm. The second step in the APV approach is to calculate the tax benefits resulting from a certain expected future debt level: Damodaran (2002) explained that tax benefits are a function of the firm's tax rate and have to be discounted back to the present at the cost of debt which reflects the riskiness of these cash flows. The author specified that, it tax benefits are viewed as a perpetuity, their value is:

$$Value\ of\ Tax\ Benefits = \frac{(Tax\ rate)(Cost\ of\ Debt)(Debt)}{Cost\ of\ debt}$$

$$= (Tax\ rate)(Debt) = t_c * D$$

The tax rate should be represented by the marginal tax rate of the firm. For what concerns tax benefits, Koller et al. (2010) specified that these can be estimated by discounting back to the present the expected tax shields resulting from interest payments in each future year. However, companies with a very high leverage may not be able to exploit future tax shields, since there is usually an associated high probability of default. In these cases, they suggest to model expected tax shields directly and not through expected interest payments: this can be done in practice by reducing each expected tax shield by the cumulative default probability.

Finally, the third step implied by the APV formula of Damodaran (2002) is to estimate the impact of the level of debt on the firm's probability of default and on expected distress costs: this step should require the evaluation of the probability of default related to the level of debt and the direct as well as indirect costs of bankruptcy. The researcher defines π_a as the probability of default due to the additional debt and BC as the present value of bankruptcy costs. It follows that:

$$PV(Expected\ Bankrupcty\ Cost) = (Probability\ of\ Bankruptcy) * PV(Bankruptcy\ costs)$$

$$= \pi_{distress} * BC$$

Damodaran (2002) defines this step of the APV approach as the most challenging one, since both the probability of bankruptcy and its associated costs cannot be estimated directly. It is worth noting that the probability of bankruptcy can be derived directly by firm's bond rating, provided the company has some bonds traded on the market. However, if this is not the case, the author proposed two ways to quantify the probability of distress/bankruptcy (it is worth noting that the theories underlying the calculations in both methods are the same of the corresponding methods explained in paragraph 2.5.1):

1. Estimate a bond rating at each debt level and make use of the estimates of default probabilities for each rating.
2. Use a statistical approach (a *probit*) to estimate the default probability at each debt level, according to the firm's observable features. In particular, firms which have filed for bankrupcty in the past have to be investigated and compared to firms which have instead survived, in a way to determine discriminating variables: then, statistical techniques can be used to estimate the probability that the company will fall into bankruptcy.

A practical execution of the first method will be illustrated in the valuation of Stefanel S.p.A., and precisely in paragraph 4.8. For what concerns bankruptcy costs, although they cannot be estimated with precision, they can be at least approximated looking at their relevance in actual bankrupticies, which studies of several practitioners have already analyzed and quantified, and which have been presented in paragraph 1.7 of this dissertation.

Since the value of the firm as if it was completely equity financed is not dependent on the level of debt, Damodaran (2002) specified a variant of the classical APV approach which does not rely on the computation of the unlevered firm value. In fact, if the appraiser prefers to take the market value of the company as given, unlevered firm value can be obtained by rearranging the original formula of the APV approach in the following way:

$$Firm\ Value_{unlevered} = current\ firm\ value - PV(tax\ benefits) + Expected\ bankruptcy\ costs$$

The components that vary with movements in firm's debt level are the expected tax benefits and bankruptcy costs. Damodaran (2002) provided 5 steps to obtain these values as leverage changes:

a) Estimate the outstanding debt amount at each debt ratio;

b) Estimate the corresponding tax benefits by simply multiplying the dollar amount by the marginal tax rate (thus, tax benefits are assumed to go on in perpetuity);

c) Estimate the debt rating, interest rate and interest expenses at each debt ratio;

d) Estimate a default probability associated with each debt rating;

e) Estimate expected bankruptcy costs through the multiplication of the probability of bankruptcy by the expected cost (the latter must be expressed as a percentage of unlevered firm value).

At this point, the value of the levered firm at different debt levels has to be computed: the level of debt which maximizes the value of the levered firm is the optimal debt ratio.

To summarize, as recognized by Damodaran (2002), the main advantage of the APV approach is that it divides the firm value into different components, isolating the effects of debt and allowing to discount each one according to different rates of required return. In particular, with firm value being basically the sum of the value of core operations and that of debt, an appraiser can also value a firm by valuing each SBU separately and then summing up the resulting values: this enables a further disaggregation and specification of the underlying assumptions concerning each firm's SBU – such as assumptions about growth rates, costs of capital, profitability levels, etc. – making the valuation result more accurate. In addition, Liberatore et al. (2014) underlined how this "unlevered method", by isolating the effects resulting from the capital structure, allow for the in-depth analysis of the firm's competitive dynamics and future developments with respect to different turnover plans. Furthermore, the method does not imply that the debt ratio remains unchanged over time, but instead it guarantees "the flexibility to keep the dollar value of debt fixed and to calculate the benefits and costs of the fixed dollar debt", as stated by Damodaran (2002, pp. 418). However, adopting the APV approach in the valuation of distressed firms has as major drawbacks the difficulty of estimating default probabilities and bankruptcy costs: for this reason, explained Damodaran (2002), most practitioners and appraiser ignore these critical costs, with the final result that the

obtained firm value is overestimated. In fact, considering only the benefits and not the costs of employing debt capital inevitably increases the firm value, while usually the potential costs of distress associated with a huge debt are much greater than the related benefits.

2.5.3 Capital Cash Flow approach

A variant of the APV approach is the Capital Cash Flow (CCF) approach, developed by Ruback (2000). As explained by Altman and Hotchkiss (2006), this valuation technique uses the same discount rate for both the unlevered firm cash flows and the tax shields:

$$Value_{enterprise} = \sum \frac{Capital\ cash\ flows}{1 + WACC_{unlevered}}$$

Altman and Hotchkiss (2006, pp. 113) further stated that "this approach assumes the debt is maintained as a fixed proportion of value, so that interest and other tax shields have the same risk as the firm". Capital cash flows have instead been defined as:

$$Capital\ cash\ flows = Net\ Income + cash\ flow\ adjustments + cash\ and\ noncash\ interest$$

In particular, cash flow adjustments include the summation of depreciation and amortization, deferred taxes, after-tax proceeds from asset disposals, and the subtraction of investments in working capital and capital expenditures. The following scheme, developed by Ruback (2000) itself, provides an intuitive understanding of the dynamics involving capital cash flows.

Figure 2.3 – Calculation of Capital Cash Flows
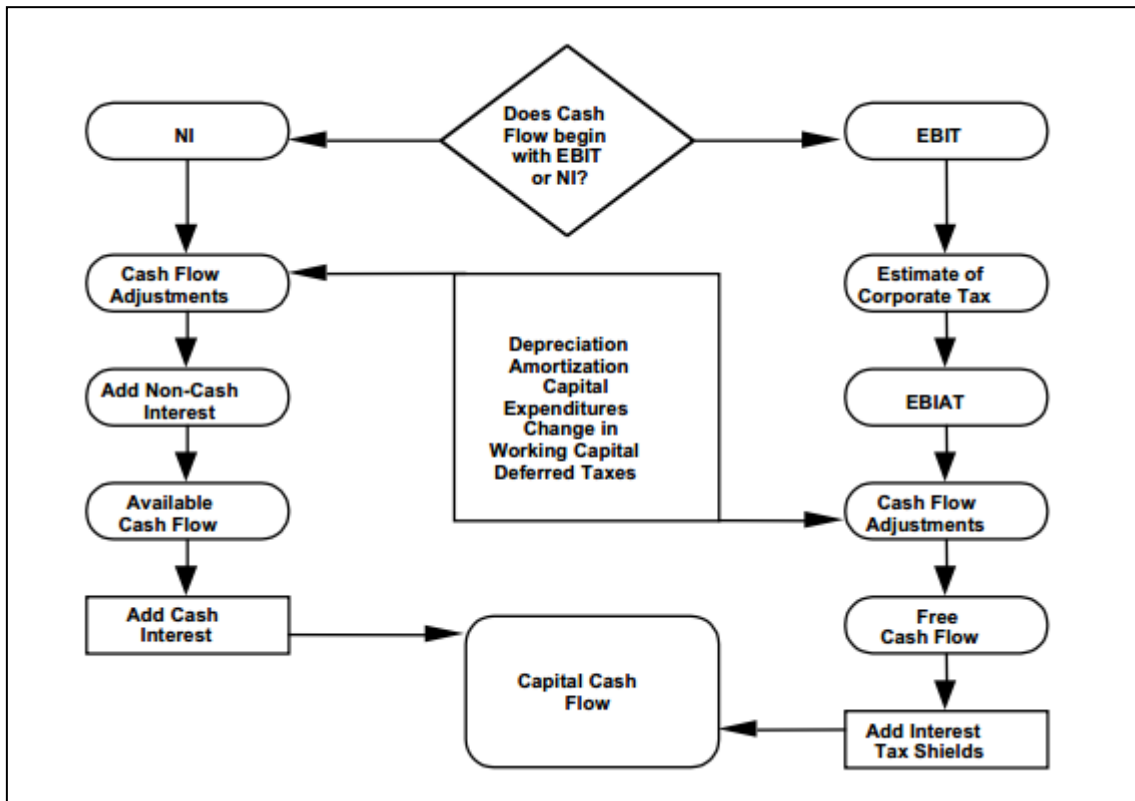
Altman and Hotchkiss (2006) highlighted that the particularity of this model is that the discount rate, represented by the WACC, is computed on an unlevered basis. In particular, it can be obtained using the CAPM for the unlevered firm:

$$WACC_{unlevered} = r_f + \beta_u * (r_m - r_f)$$

With a corresponding formula for the β_u of:

$$\beta_{unlevered} = \frac{(\beta_e * E) + (\beta_d * D)}{E + D}$$

The two practitioners continued that the Capital Cash Flow approach can be very helpful in distressed situations not only because it is not required to change the WACC as the capital structure of the company varies, but also because complex tax shields – e.g. tax loss carry-forwards – are already included in the projected cash flows.

Koller et al. (2010) highlighted that, when a company manages its capital structure to a specific debt-to-value ratio, both the FCF and the interest tax shields can be discounted at the unlevered cost of equity k_u:

$$V = \sum_{t=1}^{\infty} \frac{FCF_t}{(1 + k_u)^t} + \sum_{t=1}^{\infty} \frac{ITS_t}{(1 + k_u)^t}$$

Thus, following the work of Ruback (2000), since both FCF and interest tax shield are discounted in the same way, there is no meaning in dividing them: the two combined flows are the so-called Capital Cash Flows (that is, FCF plus ITS):

$$V = PV(CCF) = \sum_{t=1}^{\infty} \frac{FCF_t + ITS_t}{(1 + k_u)^t}$$

Although Koller et al. (2010) pinpointed how the capital cash flows can lead to the same result as WACC-base valuation models, the authors believed in the superiority of FCF models over the CCF: in fact, by separating NOPLAT and FCF from leverage, firm's core operations can be easily evaluated over time and compared with those of other companies.

Ruback (2000) compared explicitly the CCF and the APV approaches. In detail, he stated that the CCF (and the methods based on discounting FCF at the WACC as well) assumes the debt to be proportional to firm value, while the APV assumes the debt to be fixed and not dependent on firm value. Despite the fact that debt cannot be always highly correlated to firm value at all its possible levels, the author, by specifying that the majority of companies target a specific debt-to-value ratio, stated that the CCF method is more suitable than APV for corporate valuation. In this respect, the studies of Graham and Harvey (2001) investigated whether or not firms have a target debt ratio or range: they discovered that 37% of respondents have a flexible target, 34% have a tight target/range, 10% have a strict target debt ratio, while the remaining 19% do not have a target or range at all. Thus, moderate support to the fact that firms do have a target debt ratio was found. Ruback (2000) continued that there may be cases in which assuming a fixed level of debt is more appropriate, such as when there are some tax/regulatory restrictions on debt; however, he underlined that in the majority of situations the level of

debt changes in accordance with movements in market values: this implies that the CCF or the FCF-WACC based methods are preferable. Finally, since in the APV method the tax shields on interest payments are discounted at the cost of debt while in the CCF at the cost of assets, the author underlined that the firm value resulting from the APV approach is higher because interest tax shield are in this way considered less risky than the firm (the debt level is assumed to be fixed). On the contrary, the CCF and all other FCF-WACC based methods assume that debt is proportional to firm value, thus the risk of ITS is the same associated to firm's assets.

Also Gilson et al. (2000) made use of this method to value companies in distress which were undergoing a turnover/restructuring plan: the authors defined CCF as the cash available to all claimholders and comprehend interest tax shields as well as other tax benefits. In particular, the CCF method was used in the explicit period of projection, while the terminal value of the firm was calculated through a growing perpetuity of CCF in the year after the explicit forecast period. The researches then added, separately, the PV of net operating losses (that is, tax loss carry-forwards) discounted back at the cost of debt: as underlined also by Ruback (2000) the APV and CCF methods can also be combined. Gilson et al. (2000) motivated the choice of the CCF model highlighting that the capital structure of the firms they were valuing was expected to change over time, thus the CCF approach resulted of easier application with respect to FCF approaches where the WACC would have to be restated every time period. Furthermore, they also highlighted that this approach better fitted the complicated tax situations which arose in the computations. Gilson et al. (2000) discounted the CCF following the formula showed previously for the $WACC_{unlevered}$, however they calculated firms' unlevered beta β^u in a different way. In fact, the authors specified that systematic risk, in normal (non-distressed) contexts, is measured by beta usually estimated via historical returns of stock: unfortunately, for bankrupt companies these betas are often not meaningful, since stocks returns are commonly negative, thus they have little in common with the returns that holders of stocks expect from a successful reorganization process. Furthermore, reorganization plans usually entails a relevant reorganization of firm's assets, another factor which makes historical results not meaningful. Thus, Gilson et al. (2000) estimated industry betas (β_e) though the regression of monthly returns of listed firms in the same industry as the target companies and obtained the

unlevered industry beta β_u by the use of weighted ratios of equity (E), preferred equity (P), and debt (D) to total employed capital in the interested industry:

$$\beta^u = \frac{[\beta^e * E + \beta^P * P + \beta^d * D]}{[E + P + D]}$$

It is worth noting that different practitioners have different views about the relationship between the beta levered (β_e) and the beta unlevered (β_u), so it should not surprise the fact that different formulas are encountered while revising the literature on corporate valuation. An interesting study by Fernandez (2003) grouped the seven most relevant theories about the relationship between β_e and β_u, showed in figure 2.4 below for illustrative purposes only (for further details see the author's work).

Figure 2.4 – Beta levered according to seven different theories

	Theories		Formula
1	Fernández	[18]	βL = βu + (βu – βd) D (1 – T) / E
2	Damodaran	[33]	βL = βu + (D / E) βu (1 – T).
3	Practitioners	[35]	βL = βu (1+ D / E).
4	Harris-Pringle	[32]	βL = βu + (D / E) (βu – βd)
5	Myers	[26]	βL = βu + (D / E) (βu – βd) [1 – T Kd / (Kd – g)]*
6	Miles-Ezzell	[28]	βL = βu + (D / E) (βu – βd) [1 – T Kd / (1 + Kd)]
7	Modigliani-Miller	[24]	βL = βu + (D / E) [βu – βd +(T Kd / PM) – VTS (Ku – g) / (D PM)]*

* Valid only for growing perpetuities

Source: Fernandez (2003, pp. 8)

2.5.4 Assessing uncertainty through Monte Carlo techniques

One of the ultimate methods in the field of corporate valuation is the application of Monte Carlo techniques to deal with the uncertainty implied by projecting firm's performances into the future. Thus, since distress is an extreme situation surrounded by an high degree of uncertainty, it appears that Monte Carlo techniques can be very useful in the valuation of distressed companies, also because they provide meaningful results able to help creditors in taking important decisions concerning the firm's future. On the same line of thinking, Liberatore et al. (2014), speaking about valuation models founded on Monte Carlo simulations, referred to the Monte Carlo approach as a particular

cognitive and explorative methodology: it is useful as a signaling tool when complexity and uncertainty increases. In fact, simulations are able to support decisional processes because they help in identifying possible outcomes or developments given specific firm's internal and external dynamics. In particular, if certain variables are recognized as critical inputs with respect to an output, simulations can be conducted on them in order to understand what may be the possible future results. Thus, simulations are meaningful for the decisional processes because they can give a prospective view of what certain decisions can entail. With particular reference to Monte Carlo simulations, through the use of this approach, if the output variable the appraiser is interest in is, for example, firm's future cash flow, the corporate valuation procedure does not return a single estimate of future cash flow, but rather a series of possible future cash flows, from which ranges of values can be established: in fact, the power of this technique is to respond to uncertainty calculating a range of values within which, according to a specific confidence level, the output value will probably end up.

The concept was better explained by Resti and Sironi (2007), who described the Monte Carlo simulations as founded on a complex mechanism of random values generation: simulations entail the estimation of a certain probability distribution's parameters from an historical sample, followed by the generation of N simulated values for the input variable though the specified distribution. Thus, this approach makes possible the generation of an unlimited number of values, a number even greater than the number of the historical sample.

The concept was also discussed by Bozzolan (2008), who described how this method, initially conceived for applications to financial instruments (e.g. VaR), has been later adopted also in the (risk) management field. The author stated that the Monte Carlo technique consists in the simulation of facts whose probability of occurrence is approximated by a random distribution: through this technique are performed simulations which, from some input variables, return a series of output values, according to a distribution that reflects the uncertainty dynamics. Thus, the Monte Carlo technique allows for the estimation of a distribution of output values which depend on a series of inputs described by a probability function. Bozzolan (2008) continued that, since inputs are represented by probability functions, output values are returned through

algorithms which create values as expressions of the simulated casual variables: thus, output values can be represented by a probability function as well, as underlined by Bozzolan (2002) himself. To recap, the Monte Carlo approach allows for the construction of a model able to highlight the impact that uncertainties concerning firm's strategic decisions and competitive environment (inputs) have on the future performances of the company (output). An example of how the Monte Carlo technique works in risk management issues is displayed in figure 2.5: here the output variable was assumed to be firm's cash flow, while the input variables are the cash flow's underlying key value drivers (KVDs).

Figure 2.5 – Example of framework of performance@risk
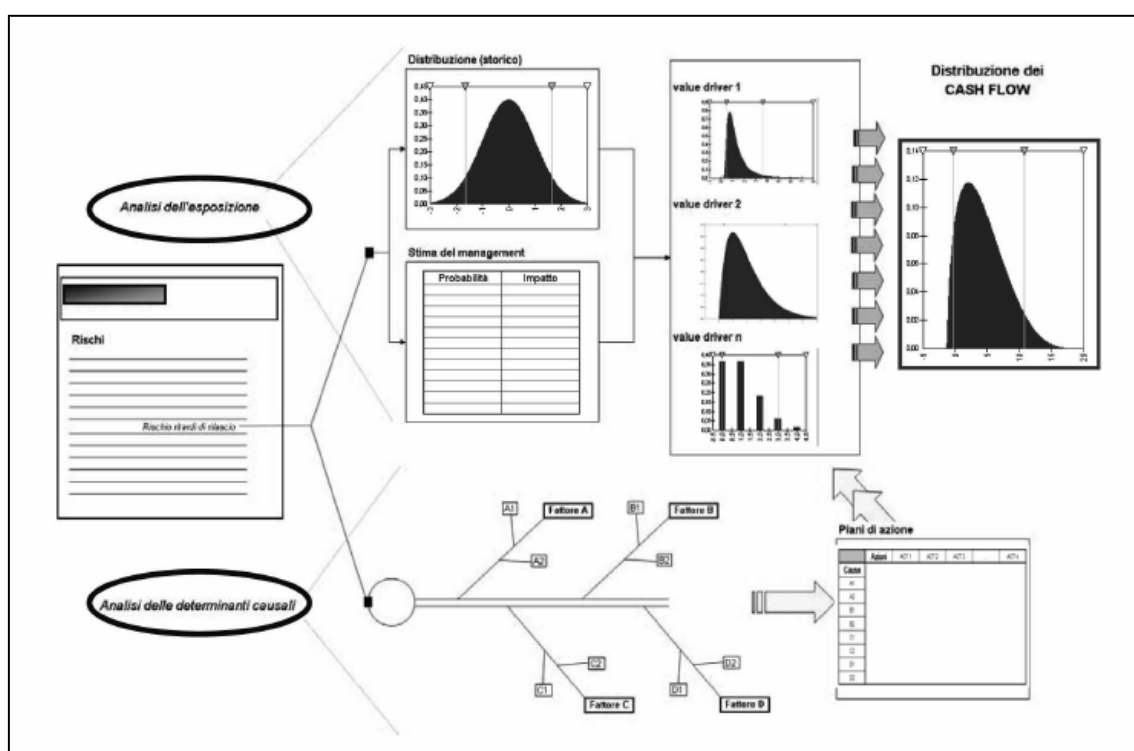
Source: Bozzolan (2008, pp. 73)

Specifically to corporate valuation, the appraiser is usually interested in evaluating how much the values of a firm's assets, debt and equity vary in relation to some key inputs, as well as whether or not bankruptcy is likely to occur in the future. It follows that, the choice of the key inputs necessary to run the Monte Carlo simulations is obviously related to the specific situation and characteristics of each company; however, the common feature of all valuation processes performed through the use of Monte Carlo

techniques is that the resulting firm value is not a single discrete number, but is instead represented by a series of discrete numbers, by a probability distribution. Ultimately, the resulting series of values can be included in a range within which, according to a specific confidence level, the firm value will probably end up. It is worth noting that the mean value of each range of firm values can be used as a reference value.

From the studies of Resti and Sironi (2007) and Damodaran (2002 and 2009), the steps an appraiser has to follow to perform a valuation of a company in distress via Monte Carlo simulations can be described as the following ones:

1. Study the specific situation and characteristics of the target company in order to understand the most critical inputs (factors) affecting the firm's cash flows and ultimately the firm value. In addition, the conditions which eventually trigger bankruptcy have to be defined.

2. Select a probability density function $f(x)$ for each input variable: the choice should rest with the probability distribution which best fits the historical characteristics of the input variable.

3. Estimate the parameters of distribution f that it, the mean, standard deviation, etc.

4. Run a series of N simulations, where in each single simulation one random number is picked from each distribution. When the generation of N simulated values for the input variables is over, a distribution of present values should have been obtained, from which the output values have to be calculated.

5. At this point, the appraiser should have ended up with firm's expected cash flows: if the prearranged conditions triggering bankruptcy are met, the firm value has to be obtained through the estimation of the liquidation or distress sale value; on the contrary, if bankruptcy is not triggered, the firm value has to be computed under the going-concern assumption. In the latter case, the mean of the resulting distribution can be used to represent the expected value for the output variable, with the standard deviation of the distribution that can be used to describe of how much the expected value can possibly vary.

Although Damodaran (2002) stated that computing the simulations is quite straight forward through the aid of Microsoft Excel add-ins and specifically designed Software

(e.g. Crystal Ball, ModelRisk, @RISK), the implementation of Monte Carlo techniques is equally quite challenging. The major difficulties consist in:

- The complexity in designing and implementing the model that should represents the relationship between the input and output variables.
- In relation to the previous point, Bozzolan (2008) stated that the Monte Carlo technique is appropriate only for those situations where a model representative of the output's evolution can be appropriately set up.
- The selection of the probability distributions (and the related parameters) more suitable to describe the characteristics of input variables. Resti and Sironi (2007) pinpointed that this step is probably the most important one: in fact it must be considered that, if a chosen distribution is not the correct one, it will not properly describe the future possible developments of the input variable: so, the calculated output values – obtained from the random numbers generated from the wrong probability distribution – would result to be completely meaningless.

2.6   Market approaches

The market approaches to corporate valuation are based on the fact that, as underlined by Gabehart and Brinkley (2002), companies which are considered similar in terms of some critical factors – such as operating in the same industry, having a similar level of assets and revenues, bearing common risks – should react similarly to market forces and thus should possess a similar firm (market) value. Given these premises, nowadays market approaches – or so-called relative valuation models – enjoy an incredible popularity in corporate valuation. In particular, there are two different techniques which derive the value of the firm by its comparison to:

- Similar/comparable companies;
- Similar/comparable market transactions.

2.6.1 Comparable companies

The approach based on comparable companies derives the value of the firm the appraiser is interested in by applying some valuation multiples calculated from similar companies. Altman and Hotchkiss (2006) described the process as composed by three steps:

1. Identification of a sample of peer or comparable publicly traded firms;
2. Analysis of how these comparable firms are valued by the equity market;
3. Application of the obtained parameters to the appraiser's target firm.

In particular, the first step provides for the identification of a set of comparable firms which should be selected because of a similarity in underlying business risk, cash flows and growth potential with respect to the target firm (Damodaran (2002)). The second step is instead based on the procedure which compares and quantifies the ratio of the listed company's current enterprise value to some profitability measures or other balance sheet's and/or income statement's items. There are a series of multiples that can be computed, with Damodaran (2002) who divided them in 4 different classes: Earnings multiples, Book value or Replacement value multiples, Revenue Multiples, Sector-specific multiples. However, the most common are:

- EV/Sales;
- EV/EBITDA or EV/EBITA or EV/EBIT;
- EV/FCF;
- Price/Earnings (P/E);
- Price/Book Value (P/B);
- Price/FCF.

Serious attention has to be paid in the choice of the multiples to apply because different multiples are more appropriate in certain situations with respect to others. In detail, Borsa Italiana (2004) pinpointed that the P/E (Price/Earnings) ratio should not be adopted since it is highly influenced by the level of indebtedness and by fiscal and accounting policies, thus by non-operating factors. Instead it is suggested the use of less discretional multiples like those based on the EBITDA or EBIT figures: however, in the case of distressed companies, profitability margins usually show a negative sign, thus

the adoption of these multiple is often not possible. The EV/Sales multiple appears to be more suitable when valuing companies with negative profitability margins or in a process of turnaround, since sales cannot be negative. Finally, averages and medians of the obtained multiples should be computed for the sample of comparable companies before they are applied to the target firm.

However, Liberatore et al. (2014) openly criticized this method because – despite the fact that their widespread usage is justified by their illusory ease of application – the value of the firm, which should be the summary of the unique characteristics and value levers of the entity itself with respect to the others operating in the same competitive environment, is instead based on the features and peculiarities of other companies. Also Koller et al. (2010) were on the same line of thinking stating that the concept of multiple is rather simple, however the methodology is often misunderstood and wrongly implemented. Instead, they suggested the use of multiples to triangulate DCF results: in fact, since DCF projections are accurate as long as their assumptions are precise, multiple analysis can help in aligning and improving forecasts. Some doubts over this method were raised also by Damodaran (2002), who stated that, even when a set of comparable firms is properly identified, inconsistencies will persist in fundamentals between the sample of firms and the target company. The problems associated with this type of technique are even worse when used to value a firm in distress, because problems arise in all the three steps described above. This was confirmed by Crystal and Mokal (2006), who pinpointed that difficulties are evident when: deciding a parameter for the distressed firm performance; choosing the financial performance period on which to base the valuation, given that the company is currently in distress; trying to identify some companies, if any, which can be considered comparable to the distressed one. In fact, if the first step is considered the most crucial for the reliability of results of this valuation technique, even the identification of a single comparable company to one in distress is a very challenging process. This is because, as commented by Altman and Hotchkiss (2006), comparable companies should bear the same risk and growth prospects of the target firm. The two researchers continued arguing that, when a firm is valued under the assumption of an underlying restructuring/turnover plan, historical data cannot be representative of future performances, thus multiples have to be applied to forecasted performances. In particular, they should not be taken in consideration for

example the cash flows produced immediately after the turnover plan has been implemented, but those of the first future year in which normal firm conditions are restored. Then, the projected performances of comparables should be used to obtain a multiple; when they are not available, a multiple computed using historical results can be computed, provided that comparable firms' projected performances do not considerably differ from the past ones.

Gilson et al. (2000) made also use of comparable companies multiples to valuate companies in distress. In particular, they adopted the EBITDA in the first forecasted year as the measure on which to base the EV. They proceeded as follows:

- Firstly, they estimated the median $\frac{EV}{EBITDA}$ for firms in the same industry
- Then, they apply the obtained median $\frac{EV}{EBITDA}$ to distressed firm's EBITDA in the first projected year. Whenever the EBITDA is negative in the first projected year, they use the first non-negative projected EBITDA.

Damodaran (2009) recognized that there are not theories on how to directly account for distress in the estimation of relative value, while also admitting the following common practices when practitioners and appraiser value distressed firms:

- Use of the Sales and EBITDA multiples simply because they are often the unique non-negative values in such contexts;
- Use of completely subjective adjustments, which obviously makes the resulting firm value totally erroneous.

In consideration of the previous issues, Damodaran (2009) proposed two methods for incorporating distress into relative valuations:

1. Build the firm's value on the valuation the market has assigned to other distressed companies: as already described, this method has the prerequisite that there must be other firms in distress operating in the same industry. If this is not the case, the author suggested to consider firms in distress in other industries, enabling a more larger sample of comparable firms at the cost that dissimilarities among firms may get worse.

2. Compute the value of the distressed company firstly applying a multiple computed on comparable healthy firms, and then evaluate the default risk of the company in distress. Thus the formula for the final value of the distressed firm is:

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

The probability of distress $\pi_{distress}$ and the distress sale value should be estimated as already described in the DCF part (paragraph 2.5.1). The author also specified that this approach is the one most reasonable when valuing a distressed company in an industry where most of firms are healthy firms.

Whichever the type of comparable firms in the sample, to calculate the multiple to apply to the distressed company, Damodaran (2009) explained that exist two different tactics:

A. Consider current values and obtain a multiple and thus a market value through those variables which are still non negative (usually sales and book values);

B. Use future projected revenues or earnings to calculate a forward multiple which have then to be compared across the sample of companies (this approach may be last resort when even the EBITDA figure is negative).

Damodaran (2009) noted again the importance of whether or not the declining/distressed company is one of the few in such conditions in the entire industry: in this case, by using the first method in a sample of healthy firms, the distressed company will simply appear cheap because it will trade at inferior multiples with respect to the comparable firms in the industry: thus, some adjustments are needed in order to make the multiple considers the discrepancies in risk, growth of revenues and future expected profitability level. For what concerns the second tactic, building multiples on future values of operations implies that the appraiser is expecting the company to survive the distress period, which is a factor that has never to be underestimated when dealing with distressed companies. Accordingly, if there is an high chance of default, make sure that the estimated value is properly discounted, also by means of the method previously illustrated which accounts directly for the probability of distress $\pi_{distress}$.

2.6.2   Comparable market transactions

The other valuation technique which relies on multiples is the one where it is used, as a proxy for the value of the firm under investigation, the transaction price paid for a similar/comparable company. In a greater detail, Kaplan and Ruback (1995) further distinguish between comparable transactions in general and comparable industry transactions: as easily deducible, the latter model uses multiples computed from transactions involving firms operating in the same industry to the one being valued. Anyway, multiples are obtained from the price paid in a comparable M&A transaction. Firstly, in order to use this technique, the appraiser must be lucky enough that an M&A operation – involving a similar company to the one which he wants to value – has been carried out recently enough so that its price (value) is representative of current market conditions and future perspectives. Secondly, as previously explained in paragraph 2.2, the price an acquirer pays in an M&A transaction reflects many specific components and it is usually a value included in an interval of values: the lowest value reflects the stand alone value of the target firm; the highest value is instead represented by the summation of the stand alone value of the target firm and the entire amount of synergies achievable through the combination of the two entities. In addition, the highest value may and often includes a control premium, which is the additional amount of money the acquirer is willing to pay in order to gain the control over the target firm. However, it might also be the case that no control premium had been paid if equity interests in the restructured company were set to result not concentrated, as stated by Crystal and Mokal (2006). Thus, it is clear that the price paid in an M&A transaction is not truly representative of the stand alone value of the target firm and cannot be judged as a reliable comparable source. In the specific case of M&A transactions involving distressed firms, the acquisition price can be even more distorted if a particularly low offered price is accepted by the distressed company because in an urgent need for liquidity. For all these reasons, Gabehart and Brinkley (2002) recommended to be very cautious when analyzing the information and data related to the sale of comparable firms. In any case, since this technique is of difficult application even in normal contexts, it appears to be rarely used in the case of distressed firms because a series of circumstances – described above – have to necessarily occur.

To conclude, relative valuation models should not be used on a stand-alone basis but always coupled with at least another valuation method. This is even more critical for firms in distress, where the difficulty in the construction of adequate multiples paves the way for unjustified subjective adjustments. Thus, as stated by Gabehart and Brinkley (2002), the results of valuations through market approaches should serve as a benchmark for other valuation results, also in consideration that they can provide useful market insights that might not be revealed through other techniques.

A final cavil that is worth noting is that, using the methods based on multiples computation, any appraiser is implicitly assuming that the equity market had correctly priced each listed company, an assumption which may prove arguable, especially in periods of economic downturn.

3 Case study: Stefanel

3.1 Introduction

After having defined what are distressed companies and their specificities, as well as explored the techniques of valuation applicable to this type of firms, these concepts will be here implemented for a real current case that is, to an Italian listed company that has found itself in a distress situation: Stefanel S.p.A.

Stefanel, since its early beginnings, have been one of the most reputable companies in the Italian apparel fashion industry, able to develop from a local entity to an internationally famous brand. However, the firm has recently developed some criticalities and weaknesses which started to unveil in 2007-2008 in conjunction with the beginning of the global financial and economic crisis: the problems have gotten worse with the passing of years, with the state of economic distress ultimately bringing the company into financial distress.

The final aim of this chapter is to clarify and explain Stefanel's path to the current distress situation. This is the reason why the Group's history, organizational structure and business model are presented in paragraph 3.2, as well as its historical results analyzed in paragraph 3.3. In particular, a comprehensive study of the firm is performed for the time period 2008-2014, thus it has been indispensable to reclassify the company's consolidated financial statements – Stefanel's reorganized Balance Sheet, Income Statement, FCF calculation, accounting ratios and growth rates can all be accessed in the Appendix. Furthermore, it was necessary to understand the business environment and the industry in which this firm operates: the results of this investigation are presented in paragraph 3.4. Lastly, in paragraph 3.5 are described and examined the progressive stages of the crisis together with all the counteractive strategies and actions undertaken by Stefanel's management team. It is worth noting that most of the information concerning the Group throughout this chapter have been taken from Stefanel's annual consolidated financial statements.

3.2 The Stefanel Group: history, organizational structure and business model

The Stefanel Group is an Italian Group operating in the apparel, fashion industry: it is formed by a series of companies controlled by Stefanel S.p.A, the parent company, listed on the MTA segment of the Milan Stock Exchange. Going back in time, the holding company was founded in 1959 by Carlo Stefanel with the name "Maglificio Piave", located in Ponte di Piave (TV): during the first years it has operated all around Italy selling handmade knitwear products only through wholesale channels. But it was under the management of Carlo's son, Giuseppe Stefanel, that the company started to expand and achieved great results: in 1980 the first store was opened in Siena and in 1982 a second one in Paris. In 1984 "Stefanel", from being a simple trademark, became the official company's name, substituting the original one "Maglificio Piave".

Figure 3.1 – Stefanel's trademark

1980   1991

Source: Adaptation from www.museodelmarchioitaliano.it

In the 80s', a series of acquisitions as well as the extensive use of franchising guaranteed the company both a national and international presence, with the company becoming a Group and listing on the Milan Stock Exchange. Particularly relevant were the acquisitions of Interfashion in 1990 and of Noel International S.A. in 2002, with the latter guaranteeing the complete control over The Nuance Group, leader of the airport retail sector. In 2007 was also created the "High" brand, trademark for the jeans &

casual chic sector, and was also signed a collaboration contract with the designer Antonio Marras for the production and distribution of the "I'M Isola Marras" brand. The Group currently represents one of the "historic" Italian fashion brands and its activities consist in the production – nowadays almost entirely carried out by third parties external to the Group – and sale to retailers and final consumers of clothes through both own and third parties licensed trademarks.

The main company's shareholder on 31/12/2014 resulted to be Giuseppe Stefanel, owning a percentage equal to approximately the 57% of the 84.528.550 total issued shares.

Figure 3.2 – Ownership distribution of company's shares

Shareholders' composition and main related data on 31/12/2014

Other shareholders 43%

Giuseppe Stefanel 57%

Outstanding shares: 84.526.556

Treasury shares: 2.240

Market Cap: €24,7 million
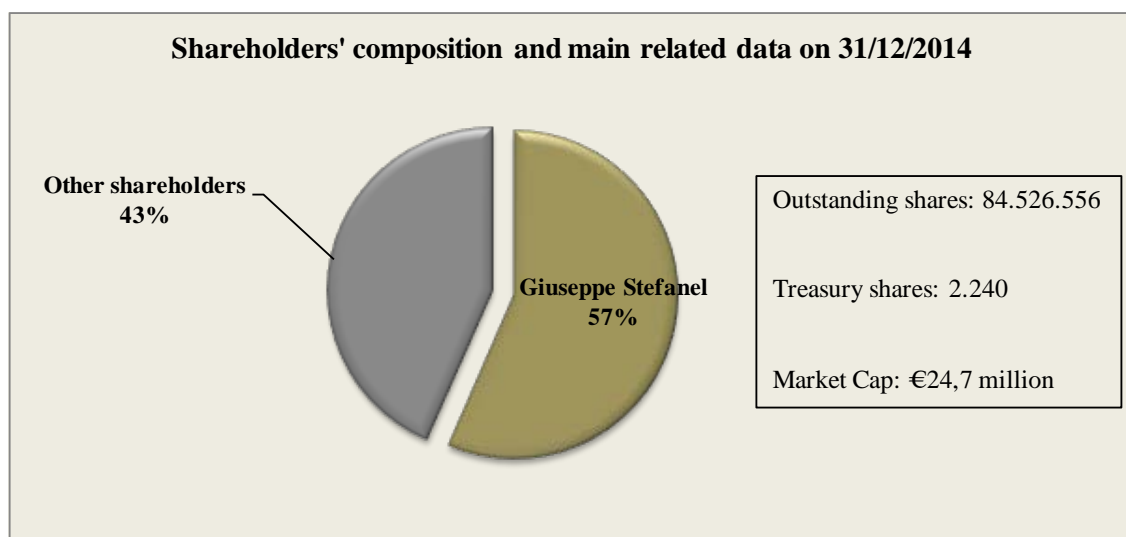
Source: Personal elaboration from Stefanel's consolidated financial statements and www.borsaitaliana.it

The Group is managed via a traditional governance structure formed by a Board of Directors whose chairman and chief executive is Giuseppe Stefanel, Elisa Lorenzon is the honorary board chairman, Achille Meucci in the role of CEO, and a series of advisors: Graziano Visentin, Francesco Spinelli, Roberto Chemello and Marina Manna as independent advisors, and finally Eleonora Stefanel.

As it is illustrated in figure 3.3, the Group's structure has branched out both at the national and international level.

Figure 3.3 – Structure of the Stefanel Group

GRUPPO STEFANEL AL 31 DICEMBRE 2014
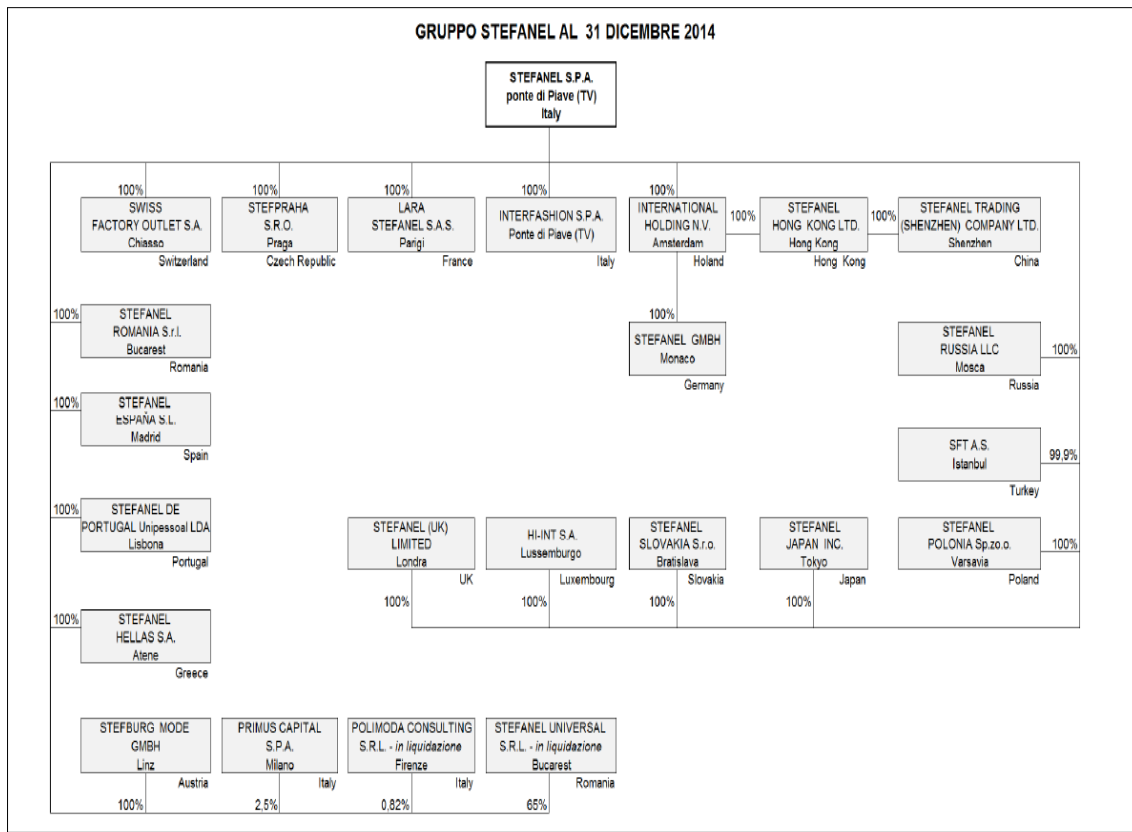
Source: Stefanel's consolidated financial statements

More specifically, the Group currently organizes its operations through two different strategic business units (SBUs): Stefanel and Interfashion.

The Stefanel SBU designs, produces and distributes clothing collections and accessories for women. The products are described as being characterized by quality and creativity, thanks to the specific know-how resulting from the long tradition the Group has in the production and distribution of knitwear and tailoring. For the Stefanel SBU a repositioning strategy has been implemented since few years, a new strategy whose aim is to collocate the Stefanel brand on an higher market segment, recouping some of the firm's original but valuable characteristics such as the handmade and Italian quality distinctiveness. In particular, Stefanel wants to offer quality designed clothes at an accessible price.

The Interfashion SBU is instead concerned with the design, production and distribution of woman clothes through both own and licensed trademarks, while assuring that each

one has a separate and independent development. The unique characteristics of this SBU are its consolidated experience in the high positioned sector for jeans & casual, as well as its long lasting relationships with the sector's best international retailers. Even the Interfashion SBU is going through a restructuring process: the goal is to transform the company from being a unique brand owner into being a multiple brands owner (such as it now owns also the High brand). This SBU is entirely managed by Interfashion S.p.A., a subsidiary wholly owned by the Group.

Continuing the description of the Group's business model, the R&D activity is considered by the company itself as a critical function and it consists in the continuous technical and stylistic renewal of the clothes' models, as well as in the constant improvement of the materials needed for the realization of products. To the R&D activity the Group not only spends significant internal resources, such as dedicating personnel exclusively to product ideation, but also external resources, signing contracts of collaboration with famous designers/stylists.

The productive system of the Stefanel Group is characterized by an high degree of flexibility while maintaining a relevant production unit connected to the firm's knitwear specific know-how, the distinctive trait of the products commercialized by the Group. Although the great part of the production is performed by third parties, it is worth noting that the Group has selected and continuously manages its commercial partners considering their ability to fulfill orders in the requested times, their technical competences as well as their quality standards, in such a way that the image of the Group is preserved.

The Stefanel Group's distribution system is organized according to its two different SBUs. For what concerns the Stefanel SBU, the distribution network has been mainly developed on mono-brand stores located in such a way to guarantee that all the geographical areas of interests are covered as well as to ensure the maintenance and/or enhancement of the brand image. The sale channels are:

- Mono-brand channel: 404 stores, of which 167 are directly managed (Directly Operated Store, D.O.S.) and situated in strategic locations, and of 237 store indirectly managed through franchising;

- Multi-brand channel: the sale of Stefanel branded products occurs in multi brands stores, both inside and outside Italy, representing a minority stake of the overall revenues.

The Group also considers fundamental the control of the distribution channels in its core sector, that's why the ownership of strategic stores pertains directly to the Group. On the other hand, for the Interfashion SBU, the distribution of products takes place mainly though the wholesale channel, and in particular through multi-brand boutiques, selected according to their location and coherence with the market positioning of the Groups' brands.

The products offering is mainly based on woman and it is quite vast: knitwear, jacket and coats, dresses and suits, top and shirts, pants, skirts, footwear and bags as well as accessories. The commercialized accessories consist of scarves, hats and caps, blankets, belts and even ponchos.

Figure 3.4 – Example of women's clothing

Source: Collage of women's clothing - www.stefanel.it

The company has recently expanded its scope producing and selling clothes and accessories also for man, however the offering (in terms of number of articles and

types) is more limited with respect to that for woman: it comprises knitwear, jacket and coats, t-shirt and shirts, pants and accessories (that is, scarves, hats and gloves).

Figure 3.5 – Example of menswear

Source: Collage of menswear - www.stefanel.it

As previously mentioned, The Stefanel Group operates both in the national and international fashion markets. In 2014, Italy represented the second market in terms of sales, accounting for the 37% of total revenues. The sales that the Group made in Europe – excluding Italy – were instead the primary source of income, representing the 58% of total revenues: in particular, Germany, Austria and Turkey were the most relevant countries, but the Group sold its products also in Switzerland, Luxembourg, Czech Republic, France, Netherlands, Spain, Portugal, Greece, Romania, Slovakia and Poland. Finally, the extra European revenues that is, the sales made in Japan, China, Hong Kong and Russia, accounted for only the 5% of overall revenues.

3.3 Historical results

The oldest historical results that will be presented throughout the analysis date back to 2008, because that year represents for Stefanel a clear discontinuity point with the past both in terms of results and of adopted business strategy. In fact:

- It is the first accounting year entirely affected by the global economic crisis (whose first signals broke out in the second half of 2007) that is, with both a negative net result and almost all operating margins in decline and negative;
- It is the year when the repositioning strategy of the Stefanel brand started, a competitive strategy which is in progress even nowadays.

Going through the last seven years that is, the time period 2008-2014, the Group has obtained unsatisfying results from several perspectives. First of all, Group's total revenues have showed a diminishing path, mainly because of the effects of the global economic crisis which started in 2007-2008, the divestiture of some SBUs but also because of some peculiar value proposition problems which will be discussed later.

Figure 3.6 – Evolution of revenues
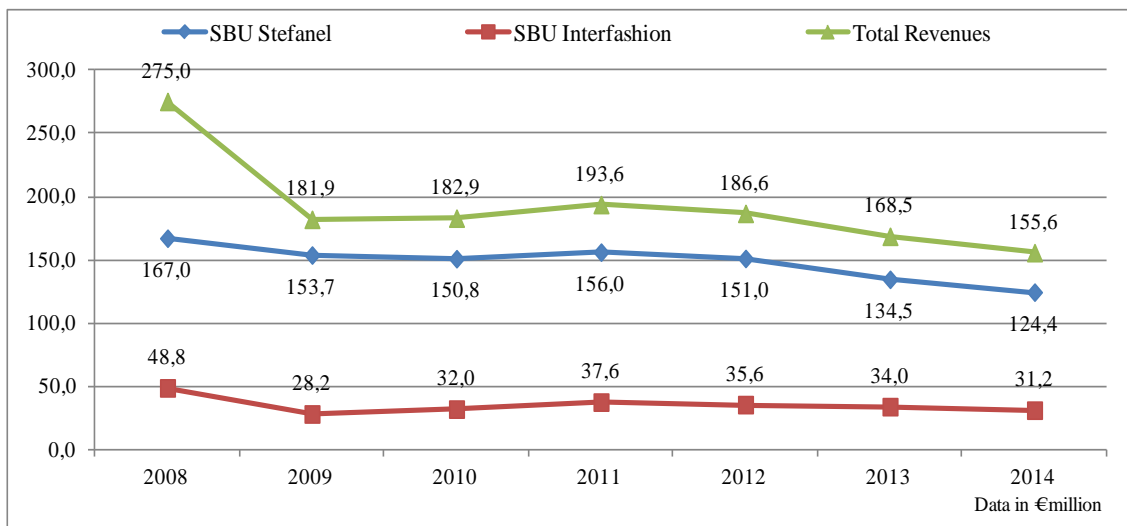
Source: Personal elaboration

The above figure shows that sales in 2008 reached € 275 million, while in 2009 there was a decrease of the 34%: this was mainly due to the divestiture of Hallhuber GmbH - a subsidiary which in 2008 formed a Group's SBU and was responsible for € 59,6

million in sales – and the beginning of the global economic crisis. In fact, as it is pointed out in all the more recent company's financial statements, the global crisis has been responsible for a severe crunch in consumers' spending power, which in turn has diminished the level of consumptions; furthermore, since the apparel and fashion industry is a mature market highly correlated to the GDP level, it has particularly suffered the negative effects of the crisis throughout all the last years. In greater detail, the decrease in revenues is attributable to the underperformances of both the Stefanel SBU, whose revenues' CAGR for the time period 2008-2014 was in fact -4,8%, and the Interfashion SBU, which showed a CAGR of -7,2%.

For what concerns the geographical distribution of revenues, as it is shown by table 3.1 and figure 3.7, there has been an important trend during the last seven years: a decrease of the revenues realized in Italy – once the primary market for the Group – coupled with a slightly decrease of the sales collected in the rest of the world. Instead, the rest of Europe has become the most important market for the Stefanel Group.

Table 3.1 – Revenue distribution (historical data)

Data in € million

	2008	2009	2010	2011	2012	2013	2014
Italy	101,1	86,6	85,0	89,3	79,6	66,2	58,0
Rest of EU	96,8	78,6	84,2	95,2	99,0	95,1	90,3
Rest of the World	17,2	16,7	13,7	9,1	8,0	7,2	7,3
Total Revenues	**215,0**	**181,9**	**182,9**	**193,6**	**186,6**	**168,5**	**155,6**

N.B. Revenues in 2008 have been adjusted removing the impact of Hallhuber GmbH's revenues (€ 59,6 million)

Source: Personal elaboration

Figure 3.7 – Geographical revenue distribution in 2008 and 2014 (% of total revenues)
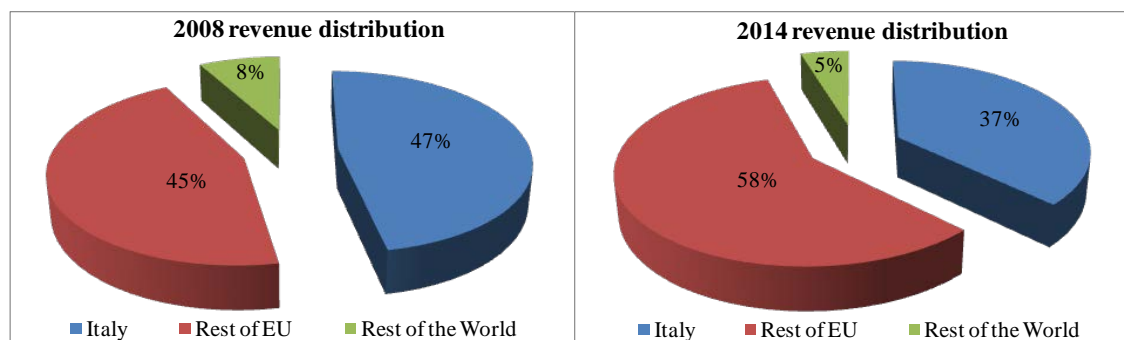
Source: Personal elaboration

Despite the declining sales, Stefanel Group surely had some relevant strategic and business model related inefficiencies, since both the operating margins and net result figures almost always show a (large) minus sign.

Table 3.2 – EBITDA, EBIT, Net Result

Data in € million

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
EBITDA	1,8	(34,1)	(26,5)	(20,5)	(3,2)	(9,2)	5,7
EBIT	(10,8)	(43,8)	(35,6)	(31,0)	(13,2)	(17,5)	(1,8)
Net Result	(20,8)	(48,7)	(35,4)	14,4	(20,2)	(24,0)	(7,8)

Source: Personal elaboration

Figure 3.8 – Evolution of EBITDA, EBIT, Net Result
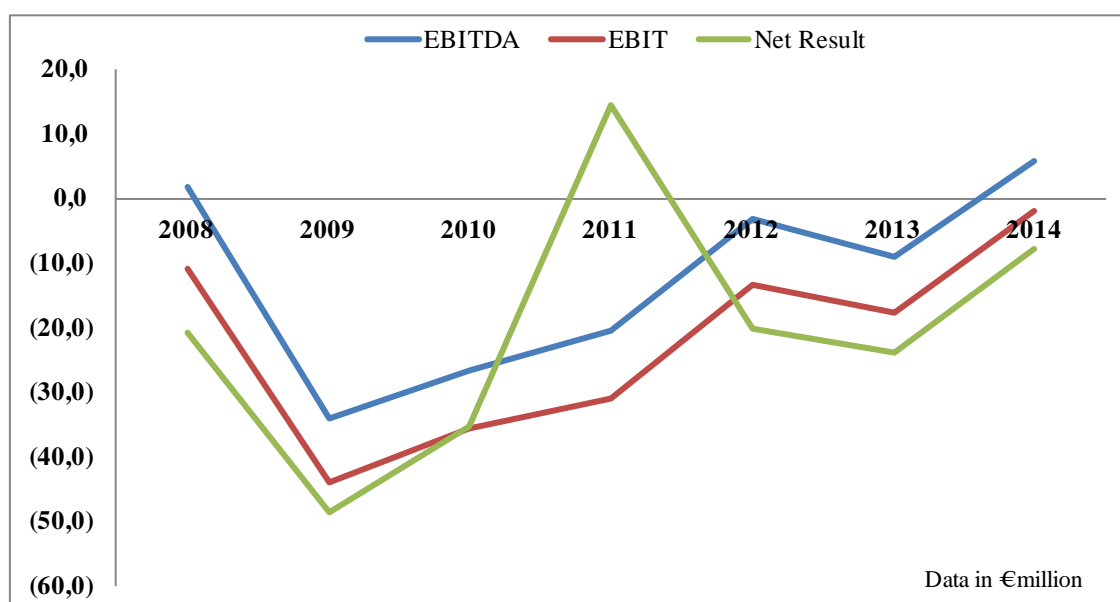
Source: Personal elaboration

The evolution of EBITDA, EBIT and Net Result in figure 3.8 makes easily noticeable the fact that the worst performances were obtained in 2009, with the company incurring more expenses than revenues in almost all past analyzed years. In fact, even if there has been an improvement in profitability since 2009, only the net result in 2011 is positive thanks to the proceeds realized through the sale of some assets considered no more strategic for the Group's operations: in fact, Stefanel sold its 50% stake of equity investment in the Luxembourger company Noel International S.A., which in turn owned the 100% of The Nuance Group, leader in the airport retail sector (also the loan which

Stefanel had previously granted to Noel International S.A. was included in this sales agreement). Without this non-recurring operation, also in 2011 Stefanel would have ended up with another economic loss.

Thus, if we want to analyze just the performance of Group's core operations, we have to look at the NOPLAT and Free Cash Flow figures: these have been constructed restating the Group's consolidated financial statements and are illustrated in figure 3.9.

Figure 3.9 – Evolution of NOPLAT and Free Cash Flow
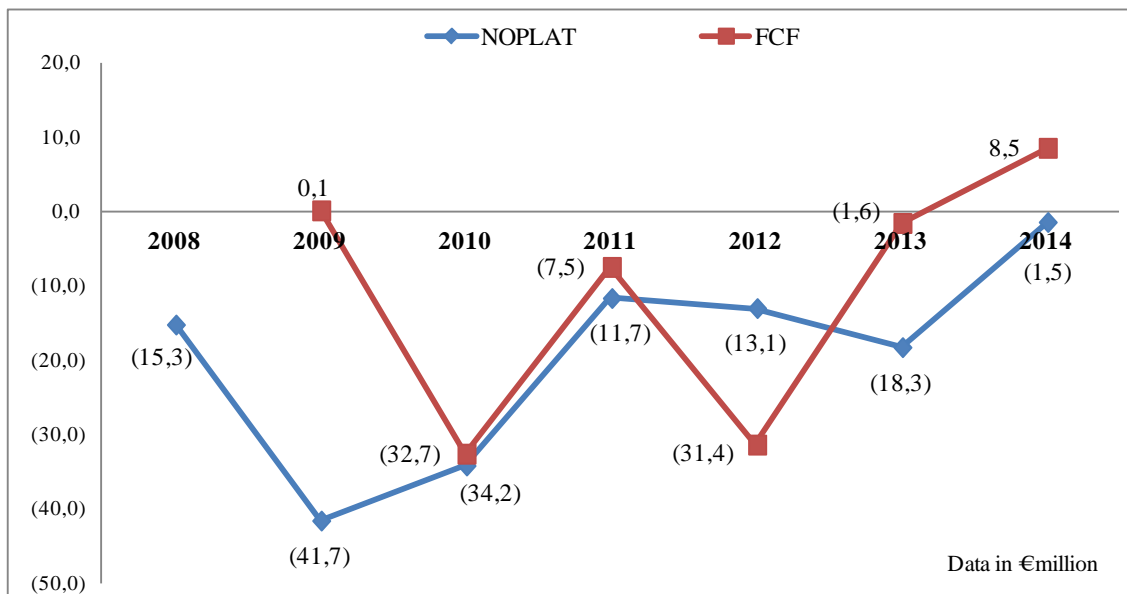
The NOPLAT that is, the profit from the Group's core operations after having subtracted adjusted income taxes, has been almost always non-positive: the core operations were consuming, instead of generating, resources. Also the FCF, which is representative of the cash flow produced by the Group's core operations after having considered the new capital investments, has often been negative but greater than the NOPLAT: this has been mainly due to the decrease in operating fixed capital and goodwill and similar intangibles. The Group, basically, had not invested enough resources to at least offset the detrimental effect of depreciation and amortization on these assets. However, FCF have recorded a significant improvement in the last two years, showing also a positive sign in 2014: this means that the Group's core operations are not "burning" cash anymore.

Figure 3.10 – Evolution of Total Invested Funds and its main components
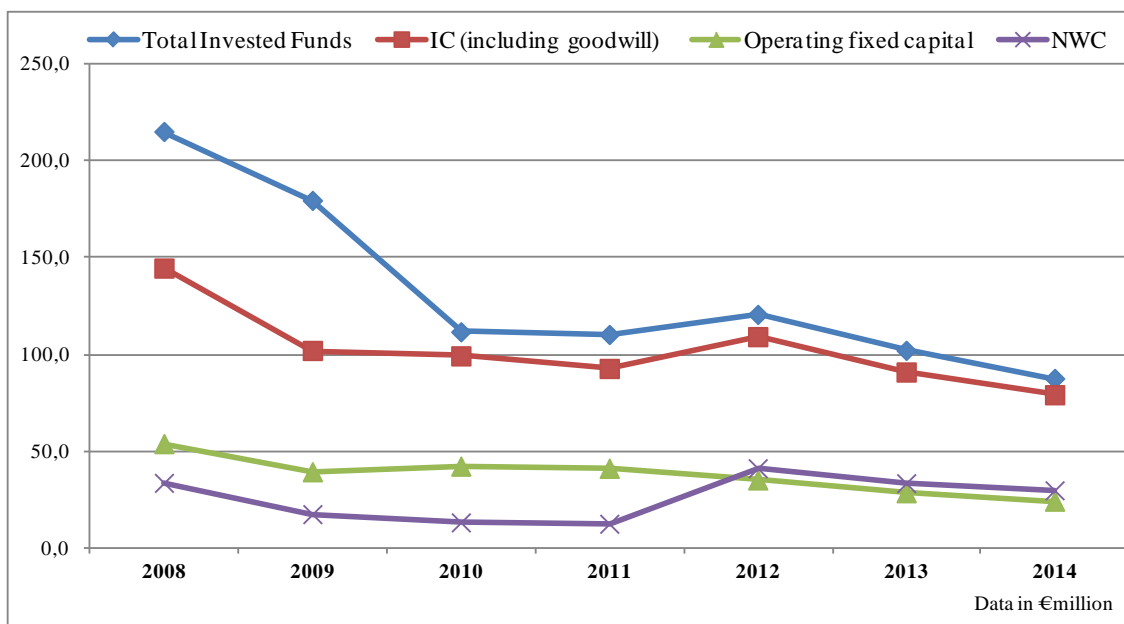
Figure 3.10 confirms one of the previous concepts that is, there has been a general cut in capital investments: tangible assets has diminished, also in consideration of the Group's decision to almost entirely outsource the production function; NWC has initially decreased and then increased, mainly because of a grow of trade receivables and a decrease of trade payables; goodwill and other similar intangibles has also reduced. Lastly, non-operating assets has decreased because of the sale of the already mentioned participation in Noel International S.A. and the correlated medium-term loan of €49 million which Stefanel had granted to the same company.

Before turning the attention to the Group's capital structure it is worth noting that, in restating the Group's financial statements, it has been considered also the "working cash" variable, which it has been assumed to correspond to 2% of yearly revenues, since the Group operates in the retail apparel industry and thus it needs more liquidity in its day-to-day operations. In addition, because of this added variable, the resulting Net Financial Indebtedness is slightly greater than the one indicated by the Group in the published consolidated financial statements.

Figure 3.11 – Group's capital structure
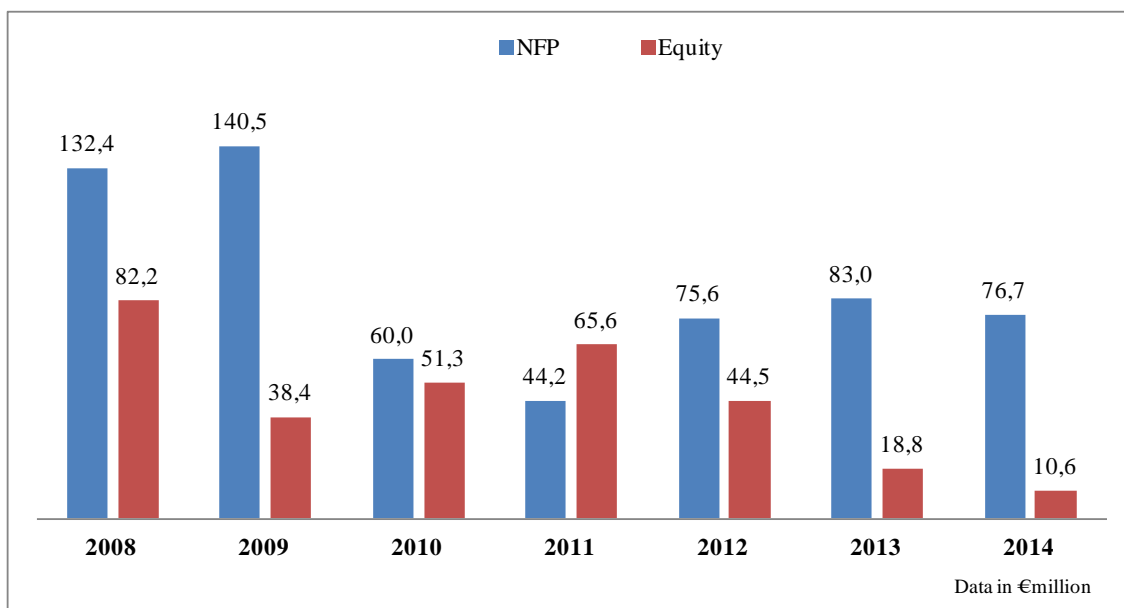
Source: Personal elaboration

As it is shown in figure 3.11, in 2008 and 2009 the Net Financial Position was considerably high, especially if compared to company's EBITDA: in 2008 the NFP was 73,4 times the EBITDA. It is clear from this analysis that in the preceding years some questionable decisions have been taken by the management team with regard to the amounts and sources of financing. In particular, in 2006 Stefanel asked for and obtained from several financial institutions a medium-term loan of € 150 million which inevitably pushed up the Net Financial Indebtedness: unfortunately, this choice was taken in an inappropriate time period. In fact, once the company was hit by the economic crisis and suffered severe losses, its capital structure – stretched out towards debt capital – led the company to bear additional costs, with the company's equity that was eroded as a consequence: the total equity fell from €82,2 million in 2008 to €38,4 million in 2009. The management was obliged to sell its assets in order to reduce the amount of debt capital: this was the meaning of the reclassification to assets held for sale of the participation in Noel International S.A. and of the related granted loan. The sale was concluded on 17/02/2011 for a price of almost €130 million, of which €85,5 million were used to pay back part of Stefanel's debts: the result was that the NFP decreased to a more acceptable level of €44,2 million in 2011.

However, in 2012 the Net Financial Indebtedness raised dramatically again (+71% with respect to the previous year): the increase was needed to counterbalance the FCF negative for €31,4 million, in which a great negative effect was played by both that year's negative loss and the rise of the operating working capital. The capital structure's disequilibrium towards debt financing has continued in the last two years, with debt that have been used to cope with Group's operational and liquidity needs, while share capital has been progressively decreased to cover the annual severe net losses.

In particular, the NFP on 31/12/2014 totaled €76,7 million.

Table 3.3 – 2014 NFP's components

Data in € million

	2014
Excess cash	(9,8)
Assets held for sale	(2,2)
Long-term borrowings	51,0
Short-term borrowings	35,1
Net financial position	**74,0**
Debt equivalents	**2,6**
NFP	**76,7**

Source: Personal elaboration

The short-borrowings amounted to €35,1 million, of which approximately €9 million represented bank overdrafts and €26 million were instead loans whose due date was within less than 1 year. The long-term borrowings were loans totaling €51 million, of which €44 million were due within 3 years while €7 million beyond 5 years. The details regarding the long-term borrowings that is, the financial institutions (banks) which lent money to the Stefanel Group and the relative conceded amount, are specified in table 3.4 below.

Table 3.4 – Details of medium and long-term borrowings

Data in € million

Financial Institute	2014	1 year < Due date < 5 years	Due date > 5 years
Pool (*) Tranche A	24,2	20,8	3,4
Pool (*) Tranche B	6,2	5,4	0,9
Pool (*) Tranche C	4,7	4,0	0,6
Banca Pop. VR	0,5	0,5	0,0
Mediocredito FVG	3,7	3,2	0,5
Unicredit	2,7	2,4	0,4
Intesa Cassa di Risparmio del Veneto	2,7	2,4	0,4
Intesa Cassa di Risparmio di Venezia	0,8	0,7	0,1
Monte dei Paschi Antonveneta	2,8	2,4	0,4
Monte dei Paschi di Siena	0,8	0,7	0,1
EFI Banca	0,7	0,6	0,1
BNP BNL	1,2	1,0	0,2
Total	**51,0**	**44,0**	**7,0**

*(*) Banca MPS S.p.A., Cassadi Risparmio del Veneto S.p.A., Cassa di Risparmio di Venezia S.p.A., Unicredit Corporate Banking S.p.A., Efibanca e Banca Nazionale del Lavoro*

Source: Personal elaboration from Stefanel's consolidated financial statements

With regard to the interest-free capital, the Group's equity has progressively fallen: on 31/12/2008 it amounted to €82,2 million, while at the end of 2014 was diminished to only €10,6 million.

Table 3.5 – Composition of Equity capital on 31/12/2014

Data in € million

Share capital	27,0
Other reserves	(9,2)
Other equity components	(0,5)
Retained earnings (losses)	(6,8)
Total group equity	**10,6**
Total minority interest	0,2
Total equity	**10,8**

Source: Personal elaboration

In fact, the share capital has been gradually reduced to compensate for the realized net losses at the end of each business year and/or the related negative reserves which had formed (also the equity injection of €50 million in 2010 has been entirely "burned"), as can be seen in figure 3.12 below.

Figure 3.12 – Group's Equity VS. Net Result
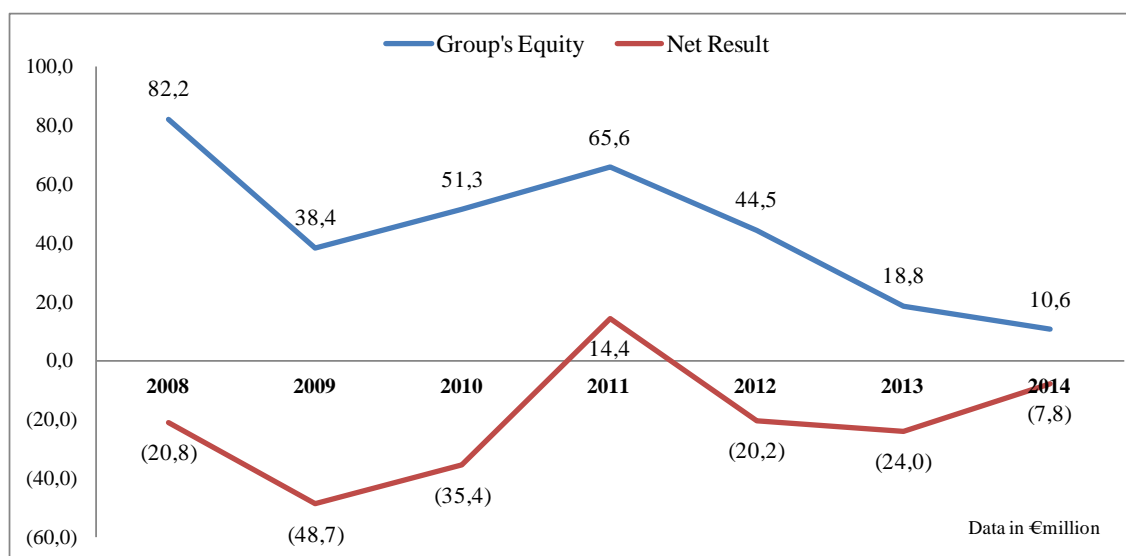
For what concerns the Group's performance, it has been evaluated through some profitability ratios summarized in table 3.6.

Table 3.6 – Profitability ratios

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
ROA	-6,6%	-18,1%	-12,0%	6,2%	-9,8%	-13,6%	-4,7%
ROE	-25,3%	-80,7%	-78,8%	24,6%	-36,7%	-75,7%	-53,2%
ROS	-3,5%	-23,7%	-18,8%	-14,8%	-6,0%	-9,5%	0,0%
ROIC	-10,6%	-33,8%	-34,1%	-12,2%	-13,0%	-18,3%	-1,7%

As you can notice, in almost all the past seven years the profitability ratios were negative: these results are not surprising, since the Group difficulties in getting a positive return from the performance of its activities have already been highlighted. However, and most importantly, there was a significant upward trend in most of these figures: in particular, the profitability of the core operating activities – measured by the ROS and ROIC ratios – became nearly positive in 2014.

Turning our attention to short-term liquidity ratios, the current and quick ratios are presented in table 3.7.

Table 3.7 – Short-term liquidity ratios

	2008	2009	2010	2011	2012	2013	2014
Current ratio	0,61	0,49	0,51	1,06	1,08	0,71	1,04
Quick (acid-test) ratio	0,01	0,04	0,00	-0,03	0,30	0,18	0,16

Source: Personal elaboration

The current ratio on 31/12/2014 resulted to be equal to 1,04 that is, the current assets of the Group are exactly sufficient to meet the current liabilities: the amount of current assets did not represent a good liquidity "cushion", however the ratio was not much lower with respect to the retail industry's average current ratio of 1,4 (as indicated by a PwC's report). Instead, the Quick ratio on 31/12/2014 was equal to 0,16: this means that the Group's ability to meet its short-term obligations using solely its more liquid assets was quite poor. Basically, the Group did not have many liquid assets in its portfolio that can fix possible unexpected relevant liquidity needs. Despite this fact, both the current and the quick ratios have improved throughout the analyzed years.

However, the inspection of Group's long-term solvency has not produced the same positive results.

Table 3.8 – Long-term solvency ratios

	2008	2009	2010	2011	2012	2013	2014
NFP/Equity	1,6	3,7	1,2	0,7	1,7	4,4	7,2
NFP/EBITDA	73,4	(4,1)	(2,3)	(2,2)	(23,6)	(9,1)	13,5
EBIT/Interest exp.	(1,1)	(7,9)	(6,6)	(8,7)	(4,7)	(6,4)	(0,6)

Source: Personal elaboration

The long-term solvency ratios showed in table 3.8 investigate Stefanel's financial structure and its ability to cover the interest expenses implied by the employed debt capital. In greater detail, the NFP/Equity is a ratio very similar to the D/E ratio that is, it describes the firm's capital structure, and in particular the proportion of debt financing (net of Group's cash and financial current assets) with respect to equity financing. As it can be easily noticed, the use of interest-bearing resources increased in the last 3 years up to a level where the NFP is approximately 7 times the equity capital.

Instead, the NFP/EBITDA explains how much debt the firm has contracted with respect to its earnings before interests, taxes, D&A; thus, it compares the debt level to the firm capacity of producing earnings from its core activities. While in the time period 2009-2013 the resulting ratios were not meaningful due to the non-positivity of the EBITDA figure, in 2014 the Group's NFP was 13,8 times the EBITDA: all these ratios are meaningful about the financial instability of the Group, being usually a ratio of 3 the maximum acceptable threshold.

Equally, the EBIT/Interest expenses figure calculates how many times the firm is able to cover the interest expenses on debts with its Net Operating Income: all years' ratio resulted to be negative, implying that the Group has not even been able to sustain the payment of interest expenses with the earnings coming from its core operations. Anyway, it is worth noting that the figure has showed an improvement in the last year thanks to the achievement of a higher EBIT margin.

To sum up, according to all the preceding ratios, in the time period 2008-2014 the Group's activities have been quite unprofitable, the short-term liquidity low and the long-term solvency questionable; however, the majority of ratios has improved during the last year.

The Group's poor performances and the doubts regarding its profitability, short-term and long-term solvency have been obviously reflected by the stock market too: Stefanel's share price has plummeted, with the 2014 performance showing a -20% result.

Figure 3.13 – Evolution of Stefanel's share price (in €) for the 2010-2014 time period

Source: www.BorsaItaliana.it

3.4 The fashion and apparel industry

In order to completely understand the causes of distress for the Stefanel case as for any other case or situation, it was necessary to investigate not only at the company's internal level but also at the industry level: the unique characteristics of the apparel and fashion industry will be analyzed in this paragraph and will help in understanding Stefanel's competitive landscape and industry's profitability level.

It is worth noting, before starting to analyze the structure of the apparel and fashion industry, that over the last years Stefanel has been positioning in the medium segment of the industry, as can be noted in figure 3.14, which was elaborated interviewing a sample of 30 people and adjusting the results with the aid of fashion blogs and forums.

Figure 3.14 – Market positioning
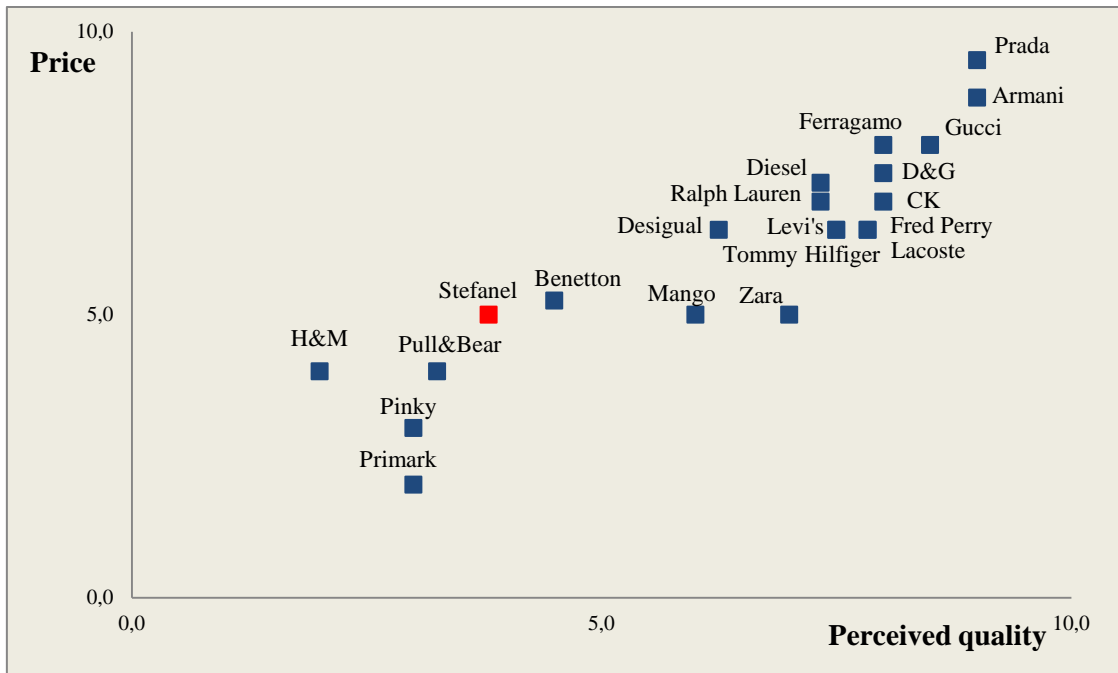
Source: Personal elaboration

The Stefanel Group has been and is currently positioned in the middle segment of the industry but the quality perceived by many costumers – in terms of cloths and design – is below the average. The resulting price-quality ratio does not seems optimal, with the perceived quality of products and the brand image which are generally felt as not coherent with the products' price. Thus, it can be affirmed that one cause of the Group's economic distress is the consumers' misperception of the brand image and products' quality, with the Group that should first of all act on the levers of communication, increasing the advertising expenses in order to improve the brand image and the related consumers' perception. In fact, this is a need recognized also in Stefanel's Business Plan for the time period 2013-2017, which will be illustrated in detail later. This is due to the fact that the premium/high segments of this industry, almost the luxury one, are far more profitable due to their weaker competitive forces and the potential applicable price mark-up. However, especially for a firm operating in the apparel/fashion industry, it is not easy at all to change the way consumers perceive the brand and its products; and even if the firm succeeds, the repositioning process usually takes many years to complete. Thus, the analysis of the competitive forces acting in the market segment

where the Stefanel Group is operating and will probably operate in the near future is crucial.

For what concerns the comprehension of the structure of the retail apparel industry and of the competitive forces acting into it, it can be applied the already mentioned tool called Porter's 5 Forces Analysis, a framework which evaluate the potential profitability that a firm can achieve in an industry in relation to five critical forces which act against it: the degree of rivalry among incumbent firms, the threat of new entrants, the threat of substitute products, the bargaining power of suppliers and that of buyers.

Figure 3.15 – Porter's 5 Forces Analysis applied to the Apparel Industry

Five Forces Analysis – Retail Apparel Industry

Degree of rivalry	3,9
Threat of new entrants	4,1
Threat of substitute products	3,8
Buyers' power	1,7
Suppliers' power	2,0
Average	**3,1**
Impact on profitability	**Strong**

Legend:

Score from	Score to	Implied rating
0,0	1,0	Very Weak
1,1	2,0	Weak
2,1	2,4	Low medium
2,5	2,5	Medium
2,6	3,0	High medium
3,1	4,0	Strong
4,1	5,0	Very strong
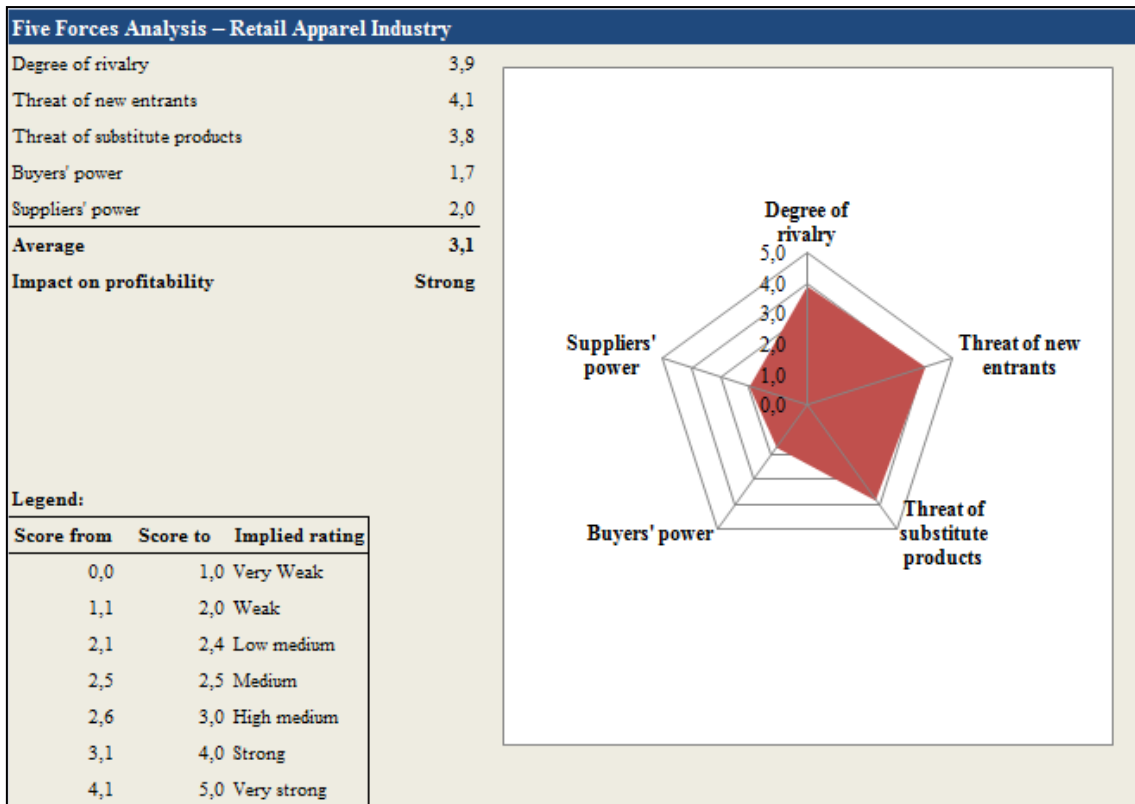
Source: Personal elaboration

As it can be seen in figure 3.15, the impact on profitability of the five forces is strong, since the average impact of each single variable results to be 3,1 in a scale from 0 to 5 (where 0 indicates a very weak/inexistent impact and 5 corresponds to a very strong/maximum impact). The fact that the impact of these forces on profitability seems

to be strong basically means that a good level of profitability in the apparel/fashion industry is possible, but not easily achievable.

In particular, the level of rivalry among existing firms is strong, due to the shrinking growth rate of the industry, the absence of switching costs for customers, the absence of relatively high exit barriers, the very low degree of concentration in this industry. In fact, the Stefanel Group has to compete with specialized retailers, with independent retailers, with department stores and also with companies selling products online. The threat of new entrants for the industry is very strong, mainly because of the relatively low entry barriers, the absence of switching costs for customers, the poor relationships that usually firms in the industry have with customers, the fact that the access to distribution channels is less important since the spreading of the online shopping, the non-sustainability of the first mover advantage. The threat of substitute products appears to be strong: given the fact that substitute products consist in unbranded or lower quality clothes (thus also counterfeit products), the performance of these products is usually proportional to their price, with the latter usually being very low with respect to the branded products; however, the buyers' willingness to switch is generally low, unless for purely economic reasons. Analyzing the bargaining power of suppliers, it can be said that they have a weak impact on firms' profitability: in fact, there is an incredibly vast number of suppliers (especially from emerging countries – e.g. the Far East in general), their differentiation is crucial only in some circumstances, switching costs for firms are medium-low, the volume of orders per supplier tends to be low. Even from the perspective of buyers, the bargaining power appears to be weak: this is because, although the switching costs are null, the volume per buyer is very small, every single consumer is different in its characteristics and the number of buyers is almost incalculable.

All the previous considerations make the medium segment of the apparel and fashion market quite a challenging industry, especially in the last years which have been characterized by a severe economic crisis, where sales have decreased for most firms and there have been a shift of the average consumers' preferences towards low-price brands, such as H&M, Zara, Mango, Primark, etc. This movement towards low-cost clothing solutions makes the price competition more tough, especially for medium

positioned firms like Stefanel: in fact, it neither has the business model/ability to retaliate the competitors' price nor an high brand image able to capture the wealthy consumers' demand. This has probably been another major cause of the Group's crisis: Stefanel has tried to established a competitive advantage based on differentiation, however it seems that consumers have not perceived the differentiating traits the Group was trying to communicate and offer.

Focusing back to the internal level, Stefanel's specificities will be judged in relation to the industry context: the SWOT analysis will be applied, a framework not only able to highlight the Group's unique strengths (S) and weaknesses (W), but also to describe opportunities (O) and threats (T) connected to the competitive environment in which the Group operates.

Table 3.9 – Stefanel Group's SWOT

STRENGTHS	WEAKNESSES
- Italian historic fashion brand; - Specific know-how on the knitwear production; - Flexibility of production system; - Long-lasting relationship with key distributors of the sector; - International presence.	- Outsourcing of production; - Brand reputation and consumers' perception (at least in Italy); - Low level of liquidity to exploit possible opportunities; - Great exposure to the fluctuations in the EUR/USD exchange rate.
OPPORTUNITIES	THREATS
- E-commerce (online sales); - Potential expansion in emerging markets (particularly inside the EU area); - Potential expansion in related segments; - Move towards the premium segment of the apparel/fashion industry; - Change of consumers' purchasing behavior towards retail fast fashion and outlet centers; - Work in partnership with other brands; - M&A transactions; - Find new business partners to consolidate the financial position.	- Consolidation of retail distributors and competition for best retail store locations; - New players in the market; - Counterfeit products; - Seasonality of sales; - Inventory level; - Potential problems with the undertaken optimization of the shop network; - Change of consumers' purchasing behavior towards retail fast fashion and outlet centers; - Failure in the implementation of the repositioning strategy.

Source: Personal elaboration

The Group can take advantage of representing an Italian historic fashion brand: in fact, all over Europe and the world, "Italian" is synonym of style, quality and fashion, particularly with regards to apparel and fashion. This characteristic should be absolutely remarked and exploited by the Group – especially outside Italy – to enhance the brand image and consumers' perception of the products. Another unique characteristic of the Group is its know-how in the knitwear segment as well as the long-lasting relationships it has established with key distributors in the industry. The fact that the Group has almost entirely outsourced the production functions have both advantages and disadvantages. One pro is the flexibility ensured by this type of structure that is, the Group can change from one supplier to another with relatively ease, as well as from one producer to another; furthermore, this type of structure enables a more quick adaptation to changing trends in customers' preferences and in the competitive environment. One con of this choice is that the Group may lack control over this critical value creation process and/or become dependent of some contractors: in fact, the Group could have rationalized the production processes if performed internally, maybe saving some costs. As already explained, there seems to be, at least in Italy, a consumers' misperception of the brand image as well as of the products' quality, in terms of quality of cloths and design: this is a critical weakness that the company has to address and resolve. Another weakness is the great influence that fluctuations in the EUR/USD exchange rate have on the Group's results: in fact, the EUR/USD exchange rate is reflected in the purchasing cost of a great portion of purchased and contracted works. Lastly, the current low level of liquidity implied by the financial distress situation may make the Group loses some valuable growth opportunities. In fact, the Group has identified some external growth opportunities but it has to deal with the just mentioned current liquidity shortage. In particular, the Group has ascertained that online sales are becoming more and more popular among consumers: this is a must for the Group strategy that has been recognized also in the Business Plan 2013-2017. Another recognized opportunity is related to the potential that emerging markets has proved in the last years in terms of demand: the company has expressed the intention to optimize the shop network and to mix the source of sales following the past years' trend. Another objective the Group is trying to achieve is to repositioning the brand onto the more lucrative premium market segment. Additional possible opportunities are represented by the expansion in apparel

related segments, acknowledging that the firm currently operates mostly in the segments of women clothes and accessories; moreover, the Group may work in partnership with other famous brands as well as realize some M&A operations, considering the high fragmentation of the apparel and fashion industry. In addition, new business partners may be approached in order to consolidate the company's financial position. Lastly, the assessed change in consumers' purchasing behavior, with the retail fast fashion and outlet centers that has grown in importance, represents an opportunity but mainly a threat: this is because over the last years the Group has been making relevant investments in the shop network, basically investing in the ability of some stores' location to attract and drive products sale. In fact, as recognized by the Group, in the case the chosen locations will prove to be erroneous, then would be suffered considerable losses: stores, as well as clothes' design, have to meet the consumers' tastes and preferences.

Thus, for strategy related purposes, the identification of the main risks (threats) the Group is exposed to is essential. Stefanel itself identifies some of the principal threats in its management's report. Among them, there is the possible entry of new firms into the industry, due to the already mentioned absence of legal barriers and of entry barriers in general. In fact, the competition takes place also at the "internet" level with those companies selling clothes via web. Furthermore, the high degree of rivalry in the industry makes more difficult and expensive the procurement of the best located commercial areas or buildings. Furthermore, the industry in which the Group operates is particularly sensitive to macroeconomic variables such as the interest rates level, inflation level, taxation level, general economic situation, consumers' confidence on future economic conditions, etc.. The fact that industry's total sales are seasonal and dependent on the general weather conditions is always a risk apparel firms have to take in consideration. And as if this was not enough, another important variable for the Stefanel Group's results – as for all firms operating in the fashion retail business – is the choice of the correct inventory level: the ability to predict the level of future demand is critical and heavily affect firms' margins and net result. More specifically to Stefanel, the Group currently faces the main risk that the strategic actions it has implemented in order to reposition its brands will fail, with the market demand not responding positively to the realized productive and communicative efforts. Another relevant threat

is the possibility that the Group will not be able to find out the financial resources it needs to conduct its businesses, given the Group's current shortage of liquidity and the difficulty to generate cash from its core activities.

3.5 Path to the crisis and its analysis

In this paragraph all the company's crisis path will be analyzed, especially how the Stefanel's management team have tried to tackle and overcome the distress situation. As already pointed out, the state of economic distress was due both to the impact of the global economic crisis and to some internal problems related to the competitive strategy and value proposition model. Another important fact is that the firm asked for a massive loan in an untimely historical moment that is, in 2006, just before the break down of the world economic crisis. Furthermore, Stefanel has not revisited in depth its competitive strategy or its model of doing business, thus during the years it was obliged to adopt some temporary solutions – which usually entail the sale of non-strategic assets (stores) or business – hoping for the general economic condition to reestablish. As a matter of fact, the Group has shut down some of its subsidiaries because of unprofitability problems: this is what has happened, for example, to Stefanel Espana S.L. and Stefanel Hungary Kft.

More specifically, during the second half of 2007 the first signals of the global economic crisis started to unveil and the Stefanel Group experienced the first relevant economic loss. Although on 31 December 2007 the Group also breached the financial covenants concerning the loan originally worth € 150 million signed on 12/07/2006, Stefanel's management was able to obtain a *waiver* in the application of the obligations concerning the loans and also in the consequences related to the breach of covenants.

On 14/02/2008 Stefanel's Board of Directors ratified the new *Business Plan 2008-2010* aimed at repositioning the Stefanel brand into an higher market segment and at recovering Interfashion's operational activities as well as at restoring the conditions of economic equilibrium after the 2007 net loss. In greater details, the Plan stated the necessity of improving Stefanel SBU's profitability through the combined effect of the following actions:

- An increase in revenues with respect to the same number of employees and stores;

- A reduction of the incidence of costs related to fixed assets and retail network as well as a review of the procedures of products emission into the market;

- Increase of the communication efforts which have to enhance the importance and visibility of the brand;

- Ideation and roll out of a new format and layout for stores in line with the new image of the brand;

- Investments in new collections – in particular with the identification of new designers and stylists – which have to meet the new strategic goals.

For what concerned the Interfashion SBU, it had to continue the activity of start up of High and I'm Isola Marras brands: in fact, 2008 would have been the first year in which the Stefanel Group would have had the license of the I'm Isola Marras brand, while the brand High was launched in 2007. Furthermore, in 2008 expired the license for the sale of the M +FG (Marithé + Francois Girbaud) brand, with Interfashion SBU not renewing it. Lastly, the Hallhuber GmbH SBU had to carry on the activity of development of the Hallhuber brand. The Stefanel's Board of Directors expected that all the Plan's illustrated processes would have taken four years to be carried out.

On 20/03/2008 Stefanel was obliged to renegotiate with the financial institutions the forecasts related to the conceded loans in a way to align them to the Business Plan 2008-2010. Subsequently, Stefanel started a recapitalization process which ended in July: 108.367.086 newly issued ordinary shares were offered to the owners of ordinary and savings shares according to a ratio of 2 newly issued ordinary shares for 1 ordinary or savings share owned and at a price of € 0,369 each, for total proceeds equaling almost € 40 million. The capital increase was entirely underwritten and the proceeds used to reduce Stefanel's financial exposure – in accordance with the terms agreed with banks on 20/03/2008 – and to finance the strategic actions planned in the Business Plan 2008-2010.

Unfortunately, the 2008 results showed a net loss of € 20,8 million with revenues in decline (-13%) with respect to the previous year: this was mainly due to the further deterioration of the global economic conditions which started to reveal in the second

half of 2007. As a consequence, the company's management has reduced the 2009 and 2010 forecasts in its Business Plan 2008-2010 – expecting a negative EBIT in both the subsequent years – and has also asked to Borsa Italiana to exclude Stefanel from the STAR segment of the Milan Stock Exchange. In addition, on 31/12/2008 the financial covenants concerning the medium-term loan originally worth € 150 million were breached again: this time the non-fulfillment was attributable to significant movements in the EUR/USD exchange rate and interest rates. Consequently, the company was forced to reclassify this item in the current liabilities.

Because of the difficulties the Group was facing that is, having to deal with a high debt whose covenants have been breached, all coupled with a series of severe economic losses, in the early months of 2009 the Group started some negotiations with its creditors in order to renegotiate the terms of the conceded loans and the underlying financial covenants. On 25/03/2009 Stefanel obtained another *waiver* in the application of the obligations concerning the loans and also in the consequences related to the breach of covenants which took place on 31/12/2008. As part of the same agreement, Stefanel renegotiated with the financial institutions the forecasts relating to the conceded loans, thus an adjustments to the required covenants was agreed; however, Stefanel was required to carry out – with deadline set on 30/06/2010 – some extraordinary operations or an equity injection of proceeds corresponding to an amount not less than €40 million.

The need for liquidity was the reasoning underlying the sale on 10/09/2009 of the 100% stake of equity investment in Hallhuber GmbH: this was a German clothing retailer firm operating in Germany, Austria and Holland thorough almost 100 stores. This business was responsible for € 59,6 million in revenues in 2009 and, at the time of sale, was obtaining a net income of € 1,5 million: thus, it was a profitable company and Stefanel sold this firm just because of an immediate need for liquidity. However, Stefanel obtained € 25 million in cash, achieving a capital gain of € 6,4 million (furthermore, it also yielded a conditional earn-out of € 3,5 million later in 2013). Furthermore, on 29/12/2009 Stefanel reached a *Standstill* Agreement with all the banks: with validity until 15/02/2010, the debt Standstill provided for the commitment of the financial

institutions to maintain available the current credit lines and to not require the residual principal payments of the loans.

The first more serious attempt to deal with the economic distress situation has been in fact made with the formulation of the Business Plan 2010-2012 and the related first Debts Restructuring Agreement the Group was obliged to sign with its creditors. The main guidelines of the *Business Plan 2010-2012* were:

- − Increase the advertising expenses up to a level corresponding to 8-9% of overall sales, with the goal of increasing the image of the Group's brand;
- − Realize significant investments to refurbish and modernize the Stefanel mono-brand shops, still with the objective of improving the brand image;
- − Focalize on the KVDs for stores' results, investing mainly in personnel formation;
- − Rationalize the distribution network: focalization on core geographical markets (and shutting down of stores in unprofitable or less relevant markets) and closure/sale of non performing stores in Italy.

Furthermore, based on the just mentioned Business Plan 2010-2012, the *first Debts Restructuring Agreement* was signed on 26/04/2010 with creditors in order to restore the Group's financial position. Recall from paragraph 1.6.2 that the Debts Restructuring Agreement ("Accordi di Ristrutturazione dei Debiti") is an out of court procedure governed by art. 182-*bis* ss. l. fall. that makes possible the restructuring of the debts' terms, provided the acceptance of creditors representing at least the 60% of the firm's debts and that its feasibility is certified by a specialist independent professional. The main conditions of the signed Agreement were:

- − Suspension of the repayment of the principal amount on medium and long-term loans, among which there is also the loan initially worth € 150 million opened with a series of banks;
- − Confirmation of the main lines of credit;
- − Equity injection for €50 million;

- Shareholders' commitment to subscribe their respective shares of equity injection (in particolar the key shareholders Giuseppe and Giovanna Stefanel, and Bestinver Gestiòn SGIIC SA).

In June 2010, as required by the agreement reached with the financial institutions on 25/03/2009, Stefanel undertook the equity injection by issuing 81.275.275 new ordinary shares which were offered to the owners of ordinary and savings shares according to a ratio of 25 newly issued ordinary shares for 1 ordinary or savings share owned and at a price of €0,615 each, for a total maximum amount of almost €50 million. The 99,05% of the total offered shares were underwritten, of which the 70,5% were directly or indirectly underwritten by Giuseppe Stefanel and Bestinver Gestiòn SGIIC SA (a privately owned investment manager). The capital increase was mainly used to cover the enormous net loss of €48,6 million suffered in the preceding year.

In February 2011 the Group concluded the sale of its 50% stake of equity investment in the Luxembourger company Noel International S.A., which in turn owns the 100% of The Nuance Group: the participation had a book value of €20,3 million, and object of the sale was also the related loan the Stefanel Group had previously conceded to Noel International S.A., which was worth an additional amount of €55,2 million. The net proceeds from this transaction amounted to € 130 million. As already explained, Stefanel was obliged to sell this asset because it has suffered severe economic losses which have eroded the company's share capital, thus it wanted to balance the company's capital structure. However, Stefanel gave away an important strategic asset that is, a group of companies operating in the airport retailing business: at that time, the Nuance Group was described as a world leader in the airport retailing segment with more than 400 stores distributed in 58 airports of 20 different countries in 4 continents. Furthermore, in 2009 the jointly controlled Nuance Group totaled €1 billion sales, with an EBIT of €8,8 million and a group net result of €2,8 million. Despite the fact that the Nuance Group was experiencing the negative consequences of the global economic crisis showing a declining trend in all its profitability margin figures – the profitability of this market niche is obviously highly correlated with that of the airline industry, an industry which in those years saw a significant decrease in the number of people passing through the airports – and that the rivalry to obtain the licenses for the sales area

in the airports has increased in the last years, this group had just came out of a process of competitive repositioning and rationalization of the concession portfolio, and it had just acquired a series of licenses for serving new airports. In addition, and most importantly, it represented an important differentiation tool for Stefanel's business strategy.

In relation to this important transaction, the Stefanel Group has presented a new Business Plan 2011-2015, coupled with a new Debts Restructuring Agreement which was signed on 23/03/2011. The *2011 Debts Restructuring Agreement* entailed the following conditions:

- Early repayment of some medium and long-term loans through the use of part of the proceeds coming from the sale of Noel International S.A., for a total amount of €85,5 million;
- Banks' commitment to provide to the Group a further line of credit (cash) for € 12 million, given the observance of the established covenants;
- Suspension until 2014 of the repayment of the principal amount on the remaining medium and long-term loans, with subsequent amortization
- Confirmation of the main lines of credit until 31/12/2013.

The covenants which have to be satisfied consist of financial measures relevant for the creditors' ability to revoke the related Debts Restructuring Agreement. These financial measures have to be calculated at the consolidated level and are related to: Group's total Equity, EBITDA, NFP/E. The new *Business Plan 2011-2015* proposed by the Group to its main creditors entails the same underlying strategies and related actions of the previous Business Plan expect for what regards the advertising expense: now they have to be in line with the market's benchmark, in order to have an adequate communication and diffusion of the brand and products image (maybe because the previously set objective of having advertising expenses at 8-9% of the overall sales was quite an unsustainable investment level, especially for the financial conditions of the Group).

Although EBITDA and EBIT figures showed a great improvement in 2012, the new implemented strategies seemed not to have the hoped impact, since net losses of 2012 still amounted to €20 million: the economic distress condition was not over. In fact, in

the same year, the Stefanel Group was obliged to reduce the working hours for many employees as well as to use the government social support schemes to lessen the impact of the restructuring process on employees' life condition. In 2013 the Group's revenues plummeted (-17%) and also the EBITDA and EBIT margins worsened, basically erasing the good trend they showed in the previous year. The net losses of these years were again covered decreasing the company's share capital and it was also necessary to close some unprofitable/non-strategic stores and assets: in fact, the Interfashion SBU did not exercise the option for the renew of the license for the I'M Isola Marras trademark, thus the last commercialize collection was the spring-summer 2014. This action was in total contrast with the strategy developed and communicated in 2008. Finally, the Stefanel Group was also obliged to further use social support schemes for some other employees. In addition, an maybe most importantly, at the verification of the debt covenants underwritten in the last Debts Restructuring Agreement, these resulted not to be below the established limits. That's why, and also in the consideration of the bad economic results just obtained, the Group started formulating a new Debts Restructuring Agreement and a connected new Business Plan.

Thus, the Group's parent company, Stefanel S.p.A., after 12 months of negotiation, signed a new *Debts Restructuring Agreement on 10/06/2014* with the financial institutions owning the Group's debt. This agreement substitutes the preceding one approved in 2011 and has validity until 31/12/2017. Its main conditions are displayed in figure 3.16.

Figure 3.16 - Debts Restructuring Agreement signed on 10/06/2014

Suspension until 30/06/2016 of the repayment of debt capital quota on medium and long-term loans, with subsequent amortization from December 2016

Confirmation of the main line of credits used on 30/09/2013 until 31/12/2017

Verification of the covenants on a 6 months-basis (at consolidated level)
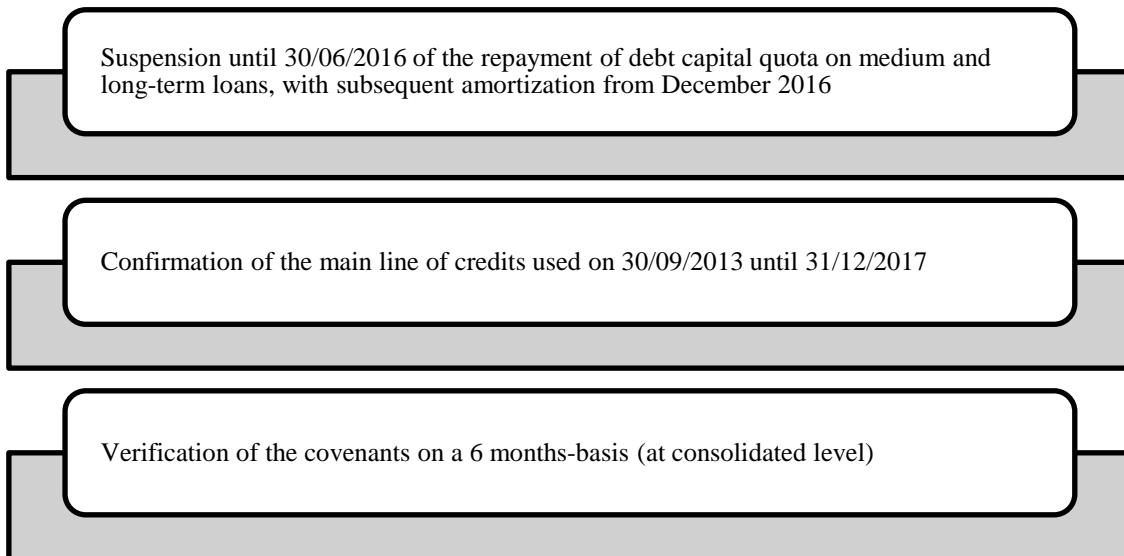
Source: Personal elaboration

The covenants prescribed by the agreement, relevant for the possibility of claiming a resolution of the financing contract by the firm's creditors, are still based on some key figures such as the EBITDA, NFP and Equity level; however, the new agreement prescribes that they have to be checked every 6 months. On 31/12/2014 these covenants were respected, thus the medium and long-term liabilities were recorded in the Balance Sheet according to the new negotiated due dates; however, one secondary financial parameter (not relevant for the Debts Restructuring Agreement's resolution) was not in compliance with the contracted terms, thus the Group has taken the agreed necessary corrective actions.

Based on the just mentioned Debts Restructuring Agreement, the Group formulated also a new *Business Plan for the period 2013-2017*, hoping that this would finally make the Group returns to an economically and financially viable situation. In particular, the new business strategy and the related main line of actions Stefanel Group's management, shareholders and credit holders agreed upon are the ones illustrated in figure 3.17.

Figure 3.17 – Business Plan 2013-2017

Increase like-for-like revenues and exploit the potential of e-commerce	
Develop the shop network (both directly managed and franchising mono-brand stores), focalizing on most remunerative Group's geographical markets	FIRM
Improve EBITDA through better sourcing and initial mark-up policies	
Stefanel SBU: continue the upward market repositioning of Stefanel brand, through a unique products offering. Act on the product and promotion levers via the strengthening of the stylistic design, the rationalization of the advertising and promotion expenses, the refurbishment of retail stores	SBU
Interfashion SBU: further develop the HIGH brand, with a particular focus on foreign markets, also through a selected network of mono-brand shops	

Source: Personal elaboration

Basically, the Plan's new competitive strategy aims at improving the brand image and products offering in order to compete in the premium segment. Furthermore, the main goals the Stefanel Group is expecting to achieve, implementing the above mentioned Business Plan, are:

1. Achieve positive EBITDA and Operating Cash Flows in 2014, with these figures further improving from 2015;
2. Earn a positive Net Result from 2016;
3. Lower the Net Financial Position from 2016;
4. Get access to new sources of financing (€5 million), which will be provided by a key shareholder in the case certain requirements will be met.

According to the numbers of the consolidated financial statements on 31/12/2014, it is true that EBITDA in 2014 turned positive after years of minus signs, but Operating Cash Flows failed to meet expectations. However, the OCFs displayed a clear enhancement (+130% with respect to 2013) as well as did the EBITDA, proving that the Group has made relevant improvements in its profitability, seemingly thanks to the effectiveness of the strategies of costs rationalization it has been implementing during

these years. Furthermore, recall that also the calculated FCF have showed an upward trend, finally turning into a positive figure in 2014: this means that the Group's core activities are not "burning" but are instead producing cash.

The main concern is that the Group is still struggling to make revenues increase. In fact, in 2014, the Group recognized that the general economic context was characterized by the perseverance of the social consequences of the global economic crisis still in action, with the growth of the unemployment level and the reduction of consumers' disposable income that generated a slightly reduction of consumptions. This depressed general economic condition, coupled with the recent years' change in the consumers' purchasing behavior (with the retail fast fashion chains and outlet centers that have been experiencing a growth in importance) were pointed out by the Group's management to be the causes of the sales reduction suffered in the last years. Finally, we can say that the Group seems to be just at the first stages of its "return to normality" path. In support of the latter argument, in 2014 we saw other transactions proving that the process of reorganization is in the middle phase, with the Group that, due to liquidity needs and strategic reasons, was forced to sale some of its retails stores (we can infer they were unprofitable ones) for €2,2 million. The same concept applies to the choice behind the early termination of the lease agreement for some stores in Dusseldorf: the net proceeds from this operation will be €6,7 million, which will serve as source of financing for the opening of two new stores in Dusseldorf (in primary locations) as well as of other stores at the international level.

To summarize, what it can be inferred after having analyzed the Group's business model, its specific characteristics, the industry in which it operates and its historical results, is that financial distress has been the result of a series of concatenated problems. Firstly, Stefanel asked for a huge loan of € 150 million in what, from an ex-post judgment, can be called an "unlucky period": basically, it undertook a considerable burden which would have caused additional costs in already problematic years. In fact, the imminent outbreak of the global financial and economic crisis in 2007-2008 accelerated and worsened the economic distress of the Group. Then, the persistence and severity of the Group's economic distress has ultimately led to financial distress. In any case, and most importantly, it has to be remembered that to the roots of Stefanel's

economic distress there are some strategic and business model related inefficiencies as well as a suboptimal positioning in the apparel and fashion market which are still causing several difficulties to the Group. In particular, a major cause is the wrong perception by customers of the Stefanel brand, a problem which the management team has tried several times to tackle through different business plans; however, no concrete and effective solutions have been found until now, on the contrary Stefanel's management team has sometimes completely revisited the previously planned actions.

4 Case study: valuation of Stefanel with a going-concern perspective

4.1 Introduction

After the in depth analysis of the Stefanel Group performed in the previous chapter, the focus of this part is to present a possible appraisal of Stefanel's economic value. It must be remembered again that, in the case of companies in distress, a valuation of the firm's economic capital is essential with respect to other cases because it serves as a basis on which stakeholders – and in particular credit holders – can make informed and adequate judgments regarding the firm's future that is, which actions are potentially more profitable to undertake.

Before going through all the numerical arguments, the latest available news at the time this valuation was performed as well as some underlying premises with respect to the valuation process have to be presented: this is the aim of paragraph 4.2. Then, the construction of the adopted model of valuation is briefly illustrated in paragraph 4.3. In particular, the model has been founded on three case scenarios representative of Stefanel's possible future developments: the main assumptions constituting each scenario are listed and explained in paragraph 4.4. Accordingly, the value of Stefanel's core operations both in the explicit interval of projection (paragraph 4.5) and in perpetuity (paragraph 4.6) has been estimated. In paragraph 4.7 are instead illustrated the computations necessary to derive the value of side effects of financing and tax loss carry-forwards; in paragraph 4.8 follows the critical computation of costs of distress. Therefore, the attainment of market values of Stefanel's assets, debts and equity in each case scenario is displayed in paragraph 4.9, while the corresponding final expected values are illustrated in paragraph 4.10 together with a sensitivity analysis which helps to better understand the obtained results.

4.2 Latest developments and general premises

The first relevant remark that has to be made is that the 2015 Stefanel's consolidated results has served as a basis on which to model future forecasts. In particular, as explained by the firm's management team, although 2015 results were generally not in contrast to the improvement trend exhibited in 2014, they were below expectations: this

was also due to the perseverance of economic downturn, with the apparel and fashion industry that has showed only slight improvements. Furthermore, Stefanel was obliged to further reduce the share capital to cover the 2014 net loss and the existing negative reserves. Another relevant fact is that Stefanel S.p.A. has sold for € 4 million a store located in Florence to Leggenda S.r.l., a firm whose main shareholder is Giuseppe Stefanel himself; then, Leggenda S.r.l. has rent the same store to Stefanel S.p.A. to permit the continuation of activities. What can be inferred is that this operation was granted by Stefanel's main shareholder with the only aim of boosting the Group's figures. It is also worth noting that, despite this modification, the Group continued to operate with the same structure and according to the same modalities illustrated in chapter 3.

On 16/03/2016 the Board of Directors specified that it was involved in:

a) Revisiting the terms and conditions of the 2014 Debts Restructuring Agreement;
b) Identifying and planning possible operations for the strengthening and balancing of the firm's capital structure;
c) Drafting the new Business Plan 2016-2019.

Most importantly, with reference to point a), on 31/12/2015 the Group breached some of the financial covenants stated in the 2014 Debts Restructuring Agreement: the non-fulfillment implies the risk of losing the benefit of the term on medium and long-term loan, thus they were reclassified in the current liabilities. However, it has to be pointed out that banks, even in this occasion, have guaranteed support to the company and the Group keeping available the previously conceded credit lines. Thus, Stefanel has subsequently started some negotiations with financial institutions in order to obtain:

1. A period of debt Standstill and moratorium until 31/12/2016;
2. A concession of new financial resources.

The strengthening of the company's financial structure depends on the result of negotiations with banks; however, Stefanel has also instructed the financial advisor Rothschild to look for possible partners in the market. Thus, several meetings are in progress with both financial institutions and interested partners: in particular, the firm's management team has reported that several partners of primary standing have been

identified, some of which have also presented formal nonbinding offers. According to the journal *la Repubblica[1]*, until now interested partners have all financial nature that is, they are PE firms or family offices.

In consideration of point c) above, Stefanel has also started to devise a new Business Plan 2016-2019 which – according to the few information currently available – follows the same strategic lines and prescribes the same actions of those indicated in Business Plan 2013-2017. What changes are the results that Stefanel is expecting to achieve in terms of performance and required time:

1. Achieve positive EBITDA and Operating Cash Flows respectively in 2016 and 2017;
2. Earn a positive Net Result from 2018.

Stefanel recognizes that the new Business Plan's forecasts are derived from some assumptions which are characterized by a relevant degree of uncertainty: the revenues path in the countries where the Group operates; the ability to realize the performance expected in terms of revenues, operating margins and OCFs; the market response to the repositioning efforts of the Stefanel brand; the evolution of supply costs and in particular of the EUR/USD exchange rate.

However, the main concern regards the current low level of company's equity, which have been eroded by years of economic losses. Moreover, in consideration of the indications provided by the Business Plan 2016-2019 and the analysis of past results, the Group is still in the middle of its turnaround strategy and needs additional resources to fund the planned actions; in addition, the company's equity will most probably have to bear two more years of economic losses, since the Group should reach a balanced budget only in 2018. Lastly, the Group has already sold almost all the assets considered non-strategic and closed all non-profitable stores. That is why for Stefanel it is not only essential to find new capital either in the form of equity or debt – even if the first option is preferable for the strengthening of firm's capital structure – but also to use properly the disposable resources. In fact, Stefanel is arrived at the point of no return in its life-cycle that is, the point where there is no more room for erroneous strategies and efforts:

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[1] Puledda V., *Stefanel avvia la quarta ristrutturazione, cerca partner e Bepi è pronto a scendere*, Repubblica, Economia & Finanza, 09/05/2016.

the repositioning strategy of the Stefanel brand must be successfully completed as well as the other actions prescribed by the last Business Plan must succeed in order to guarantee the company's going-concern.

Despite the already described problems, threats and risks the Group is and will most probably go through also in the near future, the valuation of Stefanel has been made in a going-concern perspective that is, assuming the entity will continue to exist and thus operate. The going-concern assumption has been formulated because of a series of evidences which make more probable that the firm will finally be able to recoup from the current situation of financial distress. The proofs in favor of the going-concern hypothesis are:

a) The Group seems to have understood what is the main cause to the roots of its financial distress situation: in fact, a strategic guideline that is common to all the illustrated Business Plans is the one prescribing the enhancement of Stefanel brand image and consumers' perception of the offered products through a process of market repositioning. Other important strategic guidelines provide for the rationalization of costs (and related optimization of the shop network) in order to increase the overall profitability, focalization of efforts in the geographical markets which have proven more profitable, exploitation of the potentiality of e-commerce. Although the intended strategies require years to become effective, they tackle the firm's problems and follow the latest market trends, thus they appear to be the correct ones to bring the Group back to a normal, healthy condition.

b) The Group has already exhibited some meaningful improvements in the rationalization of operating costs, including those related to personnel: these in turn have resulted in enhanced operating margins.

c) The Group has survived to what have probably been the most severe years of the global economic crisis, since many world economic indicators for the forthcoming years exhibit a positive growth rate.

d) Financial institutions (banks) owning the majority of Stefanel's debt have always guaranteed the company the financial support necessary for the continuation of operations, even when Stefanel has not respected the financial

covenants related to the €150 million loan signed in 2006 and has repetitively breached also the ones related to Agreements of Debts Restructuring. This fact is critical for the survival of the firm and, in fact, it has been emphasized several times also by the company's Board of Directors. This means that, even if in the future Stefanel will breach again one or more financial covenants, banks would most probably ask for a renegotiation of debts' terms and conditions, in any case without obliging the company to file for Bankruptcy – financial institutions will most probably safeguard the Group's continuity also in light of the facts explained in points a) ,b) and c).

Furthermore, also Stefanel's Board of Directors, although recognizing the existence of significant risks and threats which can hamper the Group's going-concern, is expecting to continue the operations in the near future, both in consideration of the results the Group has achieved in improving its profitability and because it is sure of be able to find new sources of financing.

The last interesting assumption regards the working cash variable: this item has been intentionally inserted into the valuation process because it represents the cash involved in day-to-day operations. It has been assumed to be constant and equal to 2% of annual revenues in all the historical and projected data: 2% of yearly revenues is a proxy value in consideration that retailers usually have to handle greater amounts of cash with respect to other types of business. The working cash variable has affected all the Balance Sheet and Income Statement figures containing cash: thus, for example, also the NFP results to have slightly different values with respect to the one indicated in Stefanel's consolidated financial statement.

4.3 The valuation

The valuation of Stefanel has been supposed to be performed on 31/12/2014, since it has been based on company's historical consolidated financial statements of the time period 2008-2014, with the additional aid of the firm's consolidated results on 31/12/2015. In fact, the consolidate results of the 2015 accounting year have been essential to triangulate the future projections – although the company's Board of

Directors has postponed to April 2016 the disclosure of these data for major internal issues, as already explained.

The valuation is based on the APV method whose general formula can be written as:

$$EV = EV_{unlevered} + side\ effects\ of\ financing - Distress\ costs$$

But, with respect to the original APV method which considers the firm as if completely equity financed throughout all the valuation process, in the computation of the firm continuing value it has been adopted the perpetuity based on the weighted average cost of capital (WACC). In particular, the work of a previous practitioner, Cifani (2013), has served as a basis for the valuation: however, her approach has been revisited and enlarged. In fact, firstly, all sources of value (core operations, tax shields, etc.) have been discounted back at their respective required rate of return, as implied by the theory underlying the APV method; secondly, the valuation has accounted for tax loss carry-forwards (or so-called NOLs that is, Net Operating losses) as well as for distress/bankruptcy costs. The last item is particularly important in the APV approach and is usually omitted by many practitioners because of the underlying difficulties concerning its estimation, as described by Damodaran (2002). Thus, every future cash flow that the Stefanel Group is expected to earn in the future has been discounted back to 31/12/2014, the assumed date when valuation takes place.

In greater detail, the classic APV method which evaluates the company as if it were entirely equity financed has been used in the explicit period: accordingly, firm's future FCF have been discounted back at the unlevered cost of capital. This had enabled to evaluate the company without considering the inevitable changes in the capital structures that will take place in the next five years, and which in turn would have significantly changed the cost of capital year by year. Then, for the explicit period have been added the positive tax shields resulting from the tax deductibility of interest payments on debt capital, discounted back at the estimated cost of debt. For what concerns the non-explicit period that is, the value of Stefanel in perpetuity, the formula based on the use of WACC and perpetual growth rate of cash flows has been considered: in fact, it has been assumed that Stefanel's capital structure will target the average D/E ratio of the apparel and fashion industry thus a fixed capital structure,

which enables the use of the WACC. This assumption has been already justified during the valuation by several considerations, however it is worth recalling the main one that is, as explained by Koller et al. (2010), firms choose to employ a certain amount of debt with respect to equity capital according to the advantages and disadvantages that debt entails: and usually, since firms in the same industry tend to face similar business risks – given the characteristics of a certain competitive environment – they converge to a certain capital structure. Thereafter, Stefanel's BEV has been computed and in turn its EV: the latter has been derived by adding the BEV, non-operating assets, tax loss carry-forwards and interest tax shields captured in the explicit period, and by deducting the expected distress costs from the resulting sum. Particularly critical is the consideration of distress costs into the APV method, despite the fact that their approximation results to be quite challenging, also in the consideration that indirect costs of distress are not precisely quantifiable. Finally, the expected market values of Stefanel's assets, debts and equity have been calculated by weighting the results for the different probability of occurrence of the three hypothesized scenarios.

4.4   Main assumptions

According to the fact that it has been adopted the APV method combined with the use of a continuing value based on the WACC, firstly it has to be found out Stefanel EV:

$$EV = BEV + Non\ operating\ assets + side\ effects\ of\ financing - Distress\ costs$$

$$BEV = \sum_{t=1}^{t=n} \frac{FCF_t}{(1 + K_u)^t} + PV\left(\frac{FCF_{t+1}}{WACC - g}\right)$$

In order to derive Stefanel EV, different scenarios have been elaborated: this is a common practice when dealing with uncertainty because, as stated by Liberatore et al. (2014), the development of different scenarios enables also the identification of the casual relationships between firm's internal decisions and the competitive environment. Thus, a base scenario and, with respect to this, a related best and worst scenarios have been developed, each one entailing a different probability of realization. What change from one scenario to another are the assumptions on which Group's projected future performances are based: in particular, key assumptions for a firm in the retail apparel

industry are those on revenues' growth rate (e.g. like-for-like revenues), operating costs, capital expenditures regarding retail stores, the level of inventory and in general the Working Capital management.

The *base case scenario* represents the most probable development the Group is expected to have and thus it entails a 50% probability of occurrence: as a matter of fact, it has been set up following the explicit indications provided by Stefanel's Board of Directors as well as the ones of the latest Business Plan of which, unfortunately, have been disclosed only the main guidelines published in the consolidated financial statements. Thus, basically all the first projected year's data are aligned to the Group's actual data on 31/12/2015. In particular, the first forecasted year's revenues show a positive growth rate of 0,7% with respect those of 2014, with following years' growth rates slightly increasing until they reach a 3,5% rate in 2019. The CAGR of sales for the period 2015-2019 results to be 2,2%, which is quite a prudential assumption which reflects the struggling situation the company is experiencing and will most probably experience in the following years. Personnel expenses are expected to slowly decrease in accordance with last years' trend, and this assumption is also justified by the fact that costs rationalization had been recognized by the management as a primary reorganizational action to undertake in order to improve company's profitability (in fact, it is one of the guidelines of the Group's Business Plan). The same reasoning applies also to operating costs that is, all those costs incurred by the firm in core operations except for personnel and depreciation/amortization ones: as a matter of fact, Stefanel new business strategy is focused on increasing profitability also through better sourcing and pricing policies. Investments in tangible and intangible assets for the first projected year show an important increase in line with the results on 31/12/2015, with subsequent years' expenditures that are assumed to stay almost constant: this is meant to represents the investment efforts connected to the new company's strategy, which is aimed at developing the shop network, but more specifically at equilibrating the sources of revenues according to last years' trends which show an increase in demand from European countries different from Italy and a growing importance of online shopping (e-commerce). Depreciation of tangible assets and amortization of intangible assets for 2015 are assumed to be in line with last year's data and then to slightly increase year after year because of the effect of the new above-mentioned investments. Another

important variable for valuation purposes is the trade working capital management: the days in revenues of trade receivables, inventories and trade payables for the first year of projections have been targeted to company's results on 31/12/2015. In the subsequent years, the days in revenues of trade receivables and payables are hold constant so that they move in line with revenues, while days in revenues of inventory is assumed to decrease as a result of the efficiency initiatives undertaken by Stefanel. The last critical assumption that has been made relates to the evolution of the company's equity: according the facts which took place in 2015, almost all the share capital has been eroded throughout the years, thus two small capital increases of € 5 million each are assumed to be subscribed in the 2016 and 2017 accounting years. This important assumption has been made in consideration of all the facts explained in paragraph 4.1 that is, the certainty expressed by Stefanel's Board of Directors about the ability to find new financial resources and mainly justified by the continuous support that financial institutions have always provided and the nonbinding offers submitted by interested investors.

The *best case scenario* instead expects a better Group's future development with respect to the base case scenario, thus it entails a lower probability of realization (15%). Recall that the first forecasted year's results are always in line with actual data on 31/12/2015. For what concerns total sales, their annual growth rate will improve faster than in the base case scenario, giving a CAGR of 2,7% for the period 2015-2019. Personnel expenses and operating costs will both decrease following last years' trends but at a faster rate. Moreover, assumptions on capital expenditures as well as those relating depreciation and amortization costs are the same of the ones in base case scenarios that is, there is an increase in CAPEX to support the strategy of the underlying business plan. What it is mainly expected to change with respect to the hypothesized base case scenario is the development of the trade working capital: it will generally be better managed, with the days in revenues of both trade receivables and inventories that are expected to decrease, while the days in revenues of trade payables that are expected to remain constant to 2015 results, implying a general improve in company's short-term liquidity.

Finally, the *worst case scenario* entails worse assumptions with respect to the Group's future and it reflects possible doubts regarding the future ability of the company to successfully reposition the Stefanel brand: it has a probability of occurrence of 35%. Recall again that the first forecasted year's results are always in line with actual data on 31/12/2015. Stefanel's revenues are expected to increase but at a lower path with respect to the other two cases: revenues' CAGR for the period 2015-2019 will be 1,7%. For what concerns personnel expenses, they are assumed to follow the last years' trend. Instead, looking at operating costs, it is has been assumed that Stefanel will really struggle in making operating costs to decrease: in fact, its ability to cut operating costs with respect to the level of revenues is expected to stop in 2017 at a constant rate of 78%. Investments in tangible and intangible assets are assumed to increase in the first two projected years and then to decrease year by year due to the difficulties in improving the Group's economic performance. Most importantly, the trade working capital figure is expected to increase in the explicit period of forecasting: days in revenues of trade receivables and inventories are expected to increase during the projected years, also because of firm's difficulty in selling stored products; furthermore, trade payables are hold constant at the level of 2015 actual result.

Below, in tables 4.1, 4.2 and 4.3 will be displayed the main assumptions for every case scenario.

Table 4.1 – Base Case Scenario's main assumptions

	BASE CASE				
	2015	**2016**	**2017**	**2018**	**2019**
Revenues (annual growth rate)	0,7%	1,4%	2,5%	3,0%	3,5%
Personnel expenses (% sales)	18,6%	18,0%	17,4%	16,6%	16,0%
Operating costs (% sales)	80,0%	78,5%	77,5%	76,5%	75,9%
Investments in tangible assets (% sales)	2,2%	3,0%	3,0%	3,0%	3,0%
Investments in intangible assets (% sales)	2,8%	1,5%	1,5%	1,0%	1,0%
Depreciation on oper. fixed capital	20,0%	20,5%	20,5%	21,0%	21,5%
Operating tax rate (%)	31,4%	31,4%	31,4%	31,4%	31,4%
Trade receivables (days in revenues)	63	63	63	63	63
Inventories (days in revenues)	109	107	105	100	96
Trade Payables (days in revenues)	129	129	129	129	129
Non-operating assets	16,8	16,8	16,8	16,8	16,8
Minority interest	0,2	0,2	0,2	0,2	0,2
Equity increase (decrease) in cash	0,0	5,0	5,0	0,0	0,0

Source: Personal elaboration

Table 4.2 – Best Case Scenario's main assumptions

	BEST CASE				
	2015	**2016**	**2017**	**2018**	**2019**
Revenues (annual growth rate)	0,7%	1,7%	3,0%	3,6%	4,5%
Personnel expenses (% sales)	18,6%	18,0%	17,4%	16,6%	16,0%
Operating costs (% sales)	80,0%	78,0%	76,5%	75,0%	74,0%
Investments in tangible assets (% sales)	2,2%	3,0%	3,0%	3,0%	3,0%
Investments in intangible assets (% sales)	2,8%	1,5%	1,5%	1,0%	1,0%
Depreciation on oper. fixed capital	20,0%	20,5%	20,5%	21,0%	21,5%
Operating tax rate (%)	31,4%	31,4%	31,4%	31,4%	31,4%
Trade receivables (days in revenues)	63	60	57	55	52
Inventories (days in revenues)	109	106	103	100	97
Trade Payables (days in revenues)	129	129	129	129	129
Non-operating assets	16,8	16,8	16,8	16,8	16,8
Minority interest	0,2	0,2	0,2	0,2	0,2
Equity increase (decrease) in cash	0,0	5,0	5,0	0,0	0,0

Source: Personal elaboration

Table 4.3 – Worst Case Scenario's main assumptions

	2015	**2016**	**2017**	**2018**	**2019**
Revenues (annual growth rate)	0,7%	1,1%	1,6%	2,2%	2,8%
Personnel expenses (% sales)	18,6%	18,0%	17,4%	16,6%	16,0%
Operating costs (% sales)	80,0%	78,5%	78,0%	78,0%	78,0%
Investments in tangible assets (% sales)	2,2%	3,0%	2,5%	2,0%	1,5%
Investments in intangible assets (% sales)	2,8%	1,5%	1,3%	1,1%	1,0%
Depreciation on oper. fixed capital	20,0%	20,5%	20,5%	20,5%	20,5%
Operating tax rate (%)	31,4%	31,4%	31,4%	31,4%	31,4%
Trade receivables (days in revenues)	63	65	65	70	70
Inventories (days in revenues)	109	112	115	118	121
Trade Payables (days in revenues)	129	129	129	129	129
Non-operating assets	16,8	16,8	16,8	16,8	16,8
Minority interest	0,2	0,2	0,2	0,2	0,2
Equity increase (decrease) in cash	0,0	5,0	5,0	0,0	0,0

The first header row spans: WORST CASE

Source: Personal elaboration

4.5 Explicit period of projection

The projected FCFs that the Group's will earn in the explicit time period 2015-2019, according to the preceding illustrated assumptions, have then to be discounted back to 31/12/2014 in order to obtain a value that takes account of the time factor. The theory suggests that, since we are considering the firm as if it has been all equity financed, we have to discount FCFs at the unlevered cost of equity. According to the Capital Asset Pricing Model (CAPM), as stated by Koller et al. (2010), the expected required return on a security must equal the interest rate of a risk-free security plus the security's beta multiplied by the difference between the expected return of the market and the risk-free rate. Applying this concept, the required return on a equity instrument has to satisfy the following formula:

$$E(R_e) = r_f + \beta_e[E(R_m) - r_f]$$

Furthermore, the difference between the expected return of the market and the risk-free rate is called market risk premium. This means that the minimum rate of return that investors should earn from a particular share must be equal the interest rate on risk-free

instruments plus a market risk premium. In fact, the preceding formula can also be rewritten in the following way:

$$E(R_e) = r_f + \beta_e * MRP$$

or

$$K_e = r_f + \beta_e * MRP$$

However, since Stefanel Group's FCFs have to be discounted back at the unlevered cost of capital that is, considering the company as all equity financed, the required return is:

$$K_u = r_f + \beta_u * MRP$$

The first variable it has to be found is r_f, which is simply the interest rate earned by instruments considered without risk that is, government default-free bonds. However, there are government bonds with different maturities. According to Koller et al. (2010), for valuation purposes, each cash flow should be discounted back to the present through a government bond of the same maturity; in practice it is instead used a unique interest rate, in particular the interest rate of risk-free bonds with a 10 years maturity. Here, the 10 years EU interest rate swap has been considered as a good proxy: in particular, on 31/12/2014, the 10 years IRS EU carried an interest rate equal to 0,83%[2]. This rate was quite low at that time because of the BCE decision to cut interest rates in order to boost short-term economic activity. Due to the exceptional circumstance of the event, a sensitivity analysis will be performed when analyzing the valuation results.

The second variable it has to be derived is the Market Risk Premium or Equity Risk Premium: it represents the premium that should be guaranteed to investors in order to make equally attractive shares with respect to debt instruments, thus to compensate for bearing additional risk. In particular, Damodaran (1999) pinpointed that market risk premium should be composed by a base equity premium (ERP) and a country risk premium (CRP) in order to consider both the risk associated with stocks in general and the specific risk of the country:

$$MRP = Base\ Premium\ for\ Mature\ Equity\ Market + Country\ Premium$$

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[2] http://www.mutuionline.it/guide-mutui/osservatorio-tassi-mutui.asp

Recall from the previous discussion that it is preferable to consider a company to have an exposure to country risk which differs from that to all other market risk. Thus the final formula for the unlevered cost of capital is:

$$K_u = r_f + \beta_u * ERP + \lambda * CRP$$

The symbol λ represents the exposure – in terms of company's revenues – of the firm itself with respect to a specific country.

According to Damodaran, the risk premium for a mature equity market at the end of December 2014 corresponded to 5,75%[3]. Then, it has to be calculated the CRP for the Stefanel Group: according to the theory, it has been formulated weighting the CRP of each country in which the Group operates for its relative importance in terms of revenues. The CRP for each single country refers to 31/12/2014 and were computed by Damodaran[4]. The calculation of the weighted CRP is shown in table 4.4, which has obviously considered the geographical distribution of the Stefanel Group's sales on 31/12/2014.

Table 4.4 – Calculation of the weighted CRP

	Country CRP	Sales in 2014 (%)	Weighted CRP
Italy	**2,85%**	**37,3%**	**1,06%**
Rest of EU:		**58,0%**	**0,75%**
Germany	*0,00%*	*11,6%*	*0,00%*
Austria	*0,00%*	*11,6%*	*0,00%*
Turkey	*3,30%*	*11,6%*	*0,38%*
Other European Countries	*1,59%*	*23,2%*	*0,37%*
Rest of World:		**4,7%**	**0,06%**
China	*0,90%*	*1,2%*	*0,01%*
Japan	*1,05%*	*1,2%*	*0,01%*
Hong Kong	*0,60%*	*1,2%*	*0,01%*
Russia	*2,85%*	*1,2%*	*0,03%*
Group (Total)		**100,0%**	**1,88%**

Source: Personal elaboration

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[3] http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem14.xls

[4] http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem14.xls

The unknown remaining variable is β_u, the unlevered or operating beta whose formula relies on the beta of equity, β_e. Recall that betas represent how much a specific instrument moves in line with the entire market. In normal conditions the beta of equity could have been calculated by regressing the monthly returns of Stefanel's share price against those of a benchmark stock Index (in our case the FTSE MIB) – this would have lead to β_e= -4,09 with a very low regression's R-squared, meaning that the return on Stefanel's stocks are less than the risk-free rate. Koller et al. (2010) highlighted that the average of an industry's regression betas eliminates the leverage factor; in addition, since the unlevered betas represent solely the risk of operating activities, it can be computed as an average of the industry where the firm operates in. Thus, applying historical regression to firms operating in the apparel and fashion industry which are listed in the Milan Stock Exchange (i.e. AEFFE, Brunello Cucinelli, Fila, Geox, Luxottica, Moncler, Piquadro, Ratti, Safilo, Salvatore Ferragamo, Tod's, Yoox), the adjusted average beta has resulted to be 0,39. The problem was that again the regression's R-squared was low, also because some of the considered firms have listed only few months or years earlier: a larger sample was needed.

That is why it has been used the β_u of the apparel industry in Western Europe computed by Damodaran with a sample of 132 listed firms: β_u corresponded to 0,91[5].

Finally, since $r_f = 0,83\%$, $CRP = 1,88\%$, $\beta_u = 0,91$, $ERP = 5,75\%$, the previous equation for K_u becomes:

$$K_u = 0,83\% + 0,91 * 5,75\% + 1,88\% = 7,94\%$$

Now that the unlevered cost of capital has been derived, K_u can be used to obtain the discount factor to actualize to 31/12/2014 the FCFs the Group is expected to achieve in the future: the result will be the PV of all FCFs for the time period 2015-2019. Tables 4.5, 4.6 and 4.7 illustrate the formulation of the PV of FCFs for each different scenario. In addition, the projections for the explicit period of the main balance sheet and income statement items – in each different case scenario – as well as the NOPLAT and FCF computations are available in the Appendix.

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[5] http://www.stern.nyu.edu/~adamodar/pc/archives/betaEurope14.xls

Table 4.5 – PV of FCFs (base case)

BASE CASE						
Data in € mln (not the discount factor)						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**
EBITA		(0,3)	0,9	3,6	6,7	9,1
Operating income taxes		0,1	(0,3)	(1,1)	(2,1)	(2,8)
NOPLAT		(0,2)	0,6	2,5	4,6	6,2
Change in invested capital		7,2	0,6	0,2	1,5	1,0
FCF		**7,1**	**1,2**	**2,7**	**6,1**	**7,2**
Ku		7,9%	7,9%	7,9%	7,9%	7,9%
Discount Factor		0,9	0,9	0,8	0,7	0,7
Present value of FCF		6,5	1,0	2,1	4,5	4,9
Present value of FCF$_{2015\text{-}2019}$	19,1					

Source: Personal elaboration

Table 4.6 – PV of FCFs (best case)

BEST CASE						
Data in € mln (not the discount factor)						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**
EBITA		(0,3)	1,7	5,3	9,4	12,8
Operating income taxes		0,1	(0,5)	(1,7)	(3,0)	(4,0)
NOPLAT		(0,2)	1,2	3,6	6,5	8,8
Change in invested capital		7,2	2,2	1,9	1,5	1,9
FCF		**7,1**	**3,4**	**5,5**	**7,9**	**10,7**
Ku		7,9%	7,9%	7,9%	7,9%	7,9%
Discount Factor		0,9	0,9	0,8	0,7	0,7
Present value of FCF		6,5	2,9	4,4	5,8	7,3
Present value of FCF$_{2015\text{-}2019}$	27,0					

Source: Personal elaboration

Table 4.7 – PV of FCFs (worst case)

Data in € mln (not the discount factor)	*WORST CASE*					
	2014	**2015**	**2016**	**2017**	**2018**	**2019**
EBITA		(0,3)	0,9	2,7	4,3	5,9
Operating income taxes		0,1	(0,3)	(0,9)	(1,4)	(1,8)
NOPLAT		(0,2)	0,6	1,9	3,0	4,0
Change in invested capital		7,2	(2,5)	(1,0)	(2,9)	(0,5)
FCF		**7,1**	**(1,9)**	**0,8**	**0,1**	**3,5**
Ku		7,9%	7,9%	7,9%	7,9%	7,9%
Discount Factor		0,9	0,9	0,8	0,7	0,7
Present value of FCF		6,5	(1,7)	0,7	0,0	2,4
Present value of FCF$_{2015\text{-}2019}$	8,0					

Source: Personal elaboration

4.6 Continuing value

However, in order to get the Business Enterprise Value (BEV), it must be calculated also the Continuing Value (CV) or Terminal Value (TV) – which is representative of the value of business' core operations. In the application of the classic APV method, the WACC is not considered in the valuation process because substituted by the unlevered cost of capital, with tax shields and other effects of the firm's capital structure that are calculated separately. However, it has been assumed that Stefanel will target the apparel industry's average debt-to-firm's value ratio ($\frac{D}{D+E}$) because, according to the studies of Koller et al. (2010), firms competing in the same industry tend to adopt a similar capital structure that is, it appears that for each type of industry certain amounts of debt and equity capital are more convenient than others. This is because companies operating in the same industry face similar business risks. It followed that the WACC has been adopted in the forecasting of firm's value in the non-explicit period. The motivation for using the WACC stands also in the fact that Stefanel's NFP on 31/12/2014 is € 76,2 million, and once it will be able to fix its major problems in the explicit time period that is, find new financial resources in the form of equity capital and return to economic profitability, the adjustment to the target debt-to-firm's value ratio after 2019 should not take a considerable amount of years.

Recall that the Continuing Value (or, equivalently, TV) can be expressed as:

$$CV = \frac{\text{FCF}_{n+1}}{\text{WACC} - g}$$

Variable n represents the last year considered in the explicit period. Thus, two variables have to be found: the growth rate of cash flows beyond 2019 (g) and the Weighted Average Cost of Capital (WACC). In fact, the FCF_{n+1} is built upon the $NOPLAT_{n+1}$ and the change in invested capital in the 2020 accounting year, which in turn are both based on the variable g.

For what concerns the assumption about the growth rate in perpetuity, Koller et al. (2010) suggested that one of the best estimate is the expected long-run growth rate of consumption for the underlying industry. Given that such data for the apparel industry is not freely available, the growth rate of cash flows in perpetuity has been derived in consideration of the growth rate of the GDP in the countries where the Group sells its products. It has been chosen this variable since the apparel and fashion industry is a mature market highly correlated to the GDP level, as pinpointed several times by Stefanel's management. Firstly, the utilized growth rates of countries' GDP level are those forecasted by the International Monetary Fund (IMF)[6]. Secondly, it has been estimated the percentage of total revenues attributable to each country in 2020 according to the trend that they have shown in the past years: in fact, recall that there has been a progressive decrease in the sales achieved in Italy and in the rest of the world, and an opposed increase in those realized in the rest of Europe (that is, Europe excluding Italy). Thus, each country's GDP growth rate has been weighted according to its relevance in the 2020 expected sales: table 4.8 illustrates the complete estimation.

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[6] http://www.imf.org/external/pubs/ft/weo/2014/02/weodata/index.aspx

Table 4.8 – Estimation of the weighted growth rate of revenues in 2020

	Country GDP g in 2020	Exp Sales in 2020 (%)	Weighted g in 2020
Italy	1,00%	32,00%	0,32%
Rest of EU:		65,00%	
Germany	1,27%	13,00%	0,16%
Austria	1,07%	13,00%	0,14%
Turkey	3,49%	13,00%	0,45%
Other European Countries	2,44%	26,00%	0,63%
Rest of World:		3,00%	
China	6,33%	0,75%	0,05%
Japan	0,72%	0,75%	0,01%
Hong Kong	3,29%	0,75%	0,02%
Russia	1,50%	0,75%	0,01%
Group (Total)		100,00%	1,80%

Source: Personal elaboration

The g in perpetuity has resulted to be 1,80%, which is in line and more prudential than the growth rate of 1,90% indicated in Stefanel's 2014 consolidated financial statements and used by the company in the Business Plan's projections.

The next needed variable is the WACC, the formula of which is:

$$WACC = K_e \frac{E}{EV} + K_d(1 - T_d)\frac{D}{EV}$$

However, since it is the Weighted Average Cost of Capital in perpetuity that has to be represented, the target capital structure Stefanel is going to assume in the future is a crucial variable. Thus, considering that the firm is currently in financial distress, what is the amount of debt and equity is going to employ in the future? It has been previously explained that companies operating in the same industry face similar business risks, thus historically they have exhibited similar capital structures. For this reason, the average five years capital structure of the other firms pertaining to the apparel industry and listed on the Milan Stock Exchange have been studied: the average adjusted D/E ratio at book values resulted to be 17,4%, as it can be seen in table 4.9.

Table 4.9 – Market capitalization, NFP and D/E ratio for apparel company listed in the Milan Stock Exchange

Data on 31/12/2014. MKT CAP and NFP in € mln

Company Name	MKT CAP Avg 3m	MKT CAP AVG 5Y	NFP last available	NFP avg 5y	D/E AVG 5Y	D/E
Stefanel	**25,9**	**31,9**	**78,2**	**69,7**	**219%**	**301,8%**
Comparables company						
Geox	677,4	749,5	42,3	59,8	8,0%	6,3%
AEFFE	226,7	80,8	83,6	89,6	111,0%	36,9%
Luxottica	20.575,7	14.406,9	1.255,0	1.688,0	11,7%	6,1%
Piquadro	75,2	87,6	7,0	7,1	8,1%	9,3%
Moncler	2.843,3	3.054,8	111,1	170,7	5,6%	3,9%
Brunello Cucinelli	1.209,7	1.173,9	42,6	26,9	2,3%	3,5%
Fila	16,5	16,8	58,4	71,8	427,8%	353,9%
Ratti	67,5	45,5	(0,5)	(3,2)	-6,9%	-0,7%
Tod's	2.241,6	2.680,0	(130,0)	(124,0)	-4,6%	-5,8%
Safilo	673,1	631,4	163,3	211,1	33,4%	24,3%
Salvatore Ferragamo	3.432,8	3.254,6	50,0	37,6	1,2%	1,5%
Yoox	1.081,6	835,8	(31,0)	(20,3)	-2,4%	-2,9%
Avg	**2.760,1**	**2.251,5**	**137,7**	**184,6**	**49,6%**	**36,4%**
Avg Adj	**1.252,9**	**1.259,4**	**52,7**	**65,1**	**17,4%**	**8,8%**
Median	**879,5**	**792,7**	**46,3**	**48,7**	**6,8%**	**5,0%**

Source: Personal elaboration

An interesting fact has been that, the more the number of comparable firms in the analyzed sample, the bigger the D/E ratio. Thus, since a comprehensive analysis which considers an adequate number of comparable firms was necessary, it has been checked the average D/E ratio calculated by Damodaran for the apparel firms operating in Western Europe: he approximated an average D/E ratio of 23,58%[7] (at market values). This ratio is undoubtedly more precise because firstly, he has analyzed a larger sample composed by 132 firms of the apparel industry, and secondly the ratio is calculated with market and not book values. Recapping, according to the theory previously explained, Stefanel should tend to achieve this D/E ratio because more convenient for the characteristics of the apparel industry. It follows that:

$$if \ \frac{D}{E} = 23,58\%,$$

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[7] http://www.stern.nyu.edu/~adamodar/pc/archives/betaEurope14.xls

$$D = E * 23{,}58\%$$

$$Then, \frac{D}{D+E} = \frac{E * 23{,}58\%}{(E * 23{,}58\%) + E} = \frac{E * 23{,}58\%}{E * (1 + 23{,}58\%)}$$

$$Finally, \frac{D}{D+E} = \frac{23{,}58\%}{(1 + 23{,}58\%)} = 0{,}19081$$

Continuing the computations:

$$if \ \frac{D}{E} = 23{,}58\%,$$

$$\frac{1}{E} = \frac{23{,}58\%}{D} \ and \ E = \frac{D}{23{,}58\%}$$

$$Then, \frac{E}{D+E} = \frac{\dfrac{D}{23{,}58\%}}{D + \dfrac{D}{23{,}58\%}} = \frac{\dfrac{D}{23{,}58\%}}{\dfrac{D * 23{,}58\% + D}{23{,}58\%}} = \frac{\dfrac{D}{23{,}58\%}}{\dfrac{D * (23{,}58\% + 1)}{23{,}58\%}}$$

$$continuing \ in \ the \ computations, \frac{E}{D+E} = \frac{\dfrac{D}{0{,}2358}}{\dfrac{D * (1{,}2358)}{0{,}2358}} = \frac{1}{1{,}2358} = 0{,}80919$$

All these calculations have provided the amount of debt capital and equity capital that firms in the apparel industry in Western Europe have employed, that is:

$$\frac{D}{D+E} = 0{,}19081 \quad and \quad \frac{E}{D+E} = 0{,}80919$$

$$or \ equivalently, \frac{D}{D+E} = 19{,}081\% \ and \ \frac{E}{D+E} = 80{,}919\%$$

Looking at the other unknown variables of the WACC formula, in order to obtain K_e it can be used the already explained CAPM formula:

$$K_e = r_f + \beta_e * ERP + CRP$$

The risk-free rate, r_f, is represented again by the 10 years EU interest rate swap which on 31/12/2014 carried an interest of 0,83%. The ERP at the end of 2014 has been previously set to be equal to 5,75%, while the CRP has resulted to be 1,88%.

According to the well-known theory developed by Modigliani and Miller (1958), the weighted average risk coming from the debt and equity claims of a firm must equal the weighted average risk of firm's assets. Koller et al (2010) used that model to arrive at a formula for the β_e. In particular, through a series of assumptions, they defined β_e as a function of β_u and $\frac{D}{E}$:

$$B_e = \beta_u * (1 + \frac{D}{E})$$

Damodaran (2002) developed a similar formula which considers also the fact that interest expenses related to debt are tax-deductible:

$$B_e = \beta_u * [1 + (1 - T_d) * \frac{D}{E}]$$

It has been used the first formula which does not take account of the effect of the marginal tax rate on debt interest expenses in order to avoid a double counting of this factor: in fact, we have already inserted the variable T_d in the WACC formula.

Since we have previously illustrated that β_u = 0,91 and $\frac{D}{E}$ = 23,58%, it follows that:

$$B_e = 0,91 * (1 + 23,58\%) = 1,12$$

The result almost matches the Beta Equity that Damodaran have found for the apparel fashion industry in Western Europe that is, B_e= 1,09[8].

Thus, the cost of equity has resulted to be:

$$K_e = r_f + B_e * ERP + CRP = 0,83\% + 1,12 * 5,75\% + 1,88\% = 9,15\%$$

Finally, the last unknown variable is the cost of debt, K_d. Note that the cost of debt in perpetuity is what it is needed here that is, the cost of debt when Stefanel is assumed to target the industry's debt-to-equity ratio. Thus, it has been adopted a method proposed by Damodaran (2002), which consists in estimating the so-called "synthetic ratings": accordingly, the credit rating of a particular company can be estimated by building a model which accounts for its financial characteristics. In particular, a credit rating is

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[8] http://www.stern.nyu.edu/~adamodar/pc/archives/betaEurope14.xls

attributed to the company as if it had sold some bonds into the market: thanks to this procedure, a default spread related to the firm's probability of default is assigned to the company itself.

The implied formula for the cost of debt is:

$$K_d = r_f + Company\ Default\ Spread + Global\ Default\ Spread$$

A proposed simple model builds the credit rating on the interest coverage ratio, whose formula is again:

$$Interest\ Coverage\ Ratio = \frac{EBIT}{Interest\ Expenses}$$

In consideration of the firm's resulting interest coverage ratio, a company's default spread is assigned; however, Damodaran also highlighted that the use of only this coverage ratio may lead the appraiser to overlook some important information contained in other financial ratios. Damodaran's model refers to Standard & Poor's and Moody's credit rating classes, and his 2014 updated ratings table is illustrated below.

Table 4.10 – Ratings table, Interest coverage ratio, Default spread

If interest coverage ratio is			
>	≤ to	Rating is	Default Spread is
8,50	100000	Aaa/AAA	0,40%
6,5	8,499999	Aa2/AA	0,70%
5,5	6,499999	A1/A+	0,80%
4,25	5,499999	A2/A	0,90%
3	4,249999	A3/A-	1,00%
2,5	2,999999	Baa2/BBB	1,50%
2,25	2,49999	Ba1/BB+	2,60%
2	2,2499999	Ba2/BB	3,50%
1,75	1,999999	B1/B+	5,00%
1,5	1,749999	B2/B	5,75%
1,25	1,499999	B3/B-	6,75%
0,8	1,249999	Caa/CCC	8,00%
0,65	0,799999	Ca2/CC	9,00%
0,2	0,649999	C2/C	10,00%
-100000	0,199999	D2/D	12,00%

Source: http://pages.stern.nyu.edu/~adamodar/pc/datasets/bondspreads2014.xlsx

Provided that the aim is finding the cost of debt in the non-explicit period that is, when Stefanel should target the apparel industry's D/E ratio, the average interest coverage ratio in the industry had to be investigated. Thus, the various interest coverage ratios of the companies operating in the apparel industry which are listed on the Milan Stock Exchange have been calculated, and the averages computed, as it can be seen in Table 4.11.

Table 4.11 – Interest coverage ratios and Default spread in the Italian apparel industry

Ebit and Interest exp in € mln

	EBIT	Interest exp (income)	Interest coverage ratio	Credit rating	Default Spread
Fila	28,98	4,50	6,45	A1/A+	0,80%
Geox	4,89	6,34	0,77	Ca2/CC	9,00%
AEFFE	12,00	5,90	2,03	Ba2/BB	3,50%
Luxottica	1157,60	97,99	11,81	Aaa/AAA	0,40%
Piquadro	5,96	0,02	372,38	Aaa/AAA	0,40%
Moncler	206,60	6,10	33,87	Aaa/AAA	0,40%
Brunello Cucinelli	49,33	2,90	17,01	Aaa/AAA	0,40%
Ratti	5,61	0,82	6,87	Aa2/AA	0,70%
Tod's	148,20	3,80	39,01	Aaa/AAA	0,40%
Safilo	75,00	10,40	7,21	Aa2/AA	0,70%
Salvatore Ferragamo	245,40	7,44	33,00	Aaa/AAA	0,40%
Yoox	23,25	(0,07)	-337,01	Aaa/AAA	0,40%
Avg Adj	**80,03**	**4,82**	**15,80**		**0,81%**
Avg	**163,57**	**12,18**	**16,12**		**1,46%**

Source: Personal elaboration

It has been adopted the average value 1,46% because more prudent (remember the important general concept of prudence when making assumptions and projecting future values for distressed firms), thus it will help in discount more heavily the uncertain cash flows expected in the non-explicit period. In addition, the higher value is justified by the fact that many of the analyzed companies have performed very well in the interest coverage ratio but have shown some deficiencies in other financial structure measures – such as in the NFP/EBITDA and FCFs/NFP ratios. Finally, in his computations

Damodaran added also a global default spread which at the end of 2014 corresponded to 0,75% [9].

Finally, the cost of debt for Stefanel in CV has resulted to be:

$$K_d = 0,83\% + 1,46\% + 0,75\% = 3,04\%$$

For a weighted average cost of capital of:

$$WACC = \ 9,15\% * 80,919\% + 3,04\% * (1 - 27,5\%) * 19,081\% = 7,82\%$$

This result is almost in line with the $WACC = 7,06\%$[10] (adjusted for the same risk-free interest rate) estimated by Damodaran for firms in the apparel industry in Western Europe in 2014. It is worth noting again that the very low interest rates at the end of 2014 significantly decreased all financing costs, thus also the WACC has resulted to be lower than in other historical periods.

Tables 4.12, 4.13 and 4.14 will show the calculations and the obtainment of the Stefanel's CV and BEV for each case scenario.

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[9] http://www.stern.nyu.edu/~adamodar/pc/archives/waccEurope14.xls
[10] http://www.stern.nyu.edu/~adamodar/pc/archives/waccEurope14.xls

Table 4.12 – Base case CV and BEV

BASE CASE		
Data in € mln		
	2019E	**Base for CV**
g		1,8%
WACC (continuing value)		7,8%
NOPLAT	6,2	6,3
Invested capital	42,5	43,3
NOPLAT		6,3
Change in invested capital		(0,8)
FCF		5,6
CV	**92,4**	
Present value of FCF$_{2015\text{-}2019}$	19,1	
Present value of CV	63,1	
BEV	**82,2**	

Source: Personal elaboration

Table 4.13 – Best case CV and BEV

BEST CASE		
Data in € mln		
	2019E	**Base for CV**
g		2,8%
WACC (continuing value)		7,8%
NOPLAT	8,8	9,0
Invested capital	38,3	39,4
NOPLAT		9,0
Change in invested capital		(1,1)
FCF		7,9
CV	**157,8**	
Present value of FCF$_{2015\text{-}2019}$	27,0	
Present value of CV	107,7	
BEV	**134,7**	

Source: Personal elaboration

Table 4.14 – Worst case CV and BEV

WORST CASE		
Data in € mln		
	2019E	**Base for CV**
g		0,8%
WACC (continuing value)		7,8%
NOPLAT	4,0	4,0
Invested capital	52,7	53,1
NOPLAT		4,0
Change in invested capital		(0,4)
FCF		3,6
CV	**51,7**	
Present value of FCF$_{2015-2019}$	8,0	
Present value of CV	35,3	
BEV	**43,3**	

Source: Personal elaboration

4.7 Side effects of financing and tax loss carry-forwards

Tax shields coming from interest payments – as well as all other positive effects derived by the use of debt capital – have to be discounted back to 31/12/2014 by Stefanel's cost of debt, which is representative of the additional risk borne by the company in order to achieve such surpluses.

At the end of 2014 the cost of debt for Stefanel could be approximated – as already shown in the part of the calculation of continuing value – through the formula:

$$K_d = r_f + Company\ Default\ Spread + Global\ Default\ Spread$$

Recall also table 4.10 which relates a company's interest coverage ratio with a credit rating and in turn with a company default spread: since at the end of 2014 Stefanel scored a interest coverage ratio of -0,6, it would have had a credit rating of D2 or D and a relative company default spread of 12%. Furthermore, the global default spread was 0,75%. Thus, the cost of capital at the end of 2014 could be approximated to.

$$K_d = 0,83\% + 12\% + 0,75\% = 13,58\%$$

Recall from a preceding discussion that normally the APV method does not entail the application of the WACC in the calculation of the firm's continuing value; however, it has been assumed that Stefanel will target the apparel industry's average $\frac{D}{D+E} = 19,081\%$, according to the already explained theory that firms in the same industry face the same business risks and thus tend to employ a similar capital structure. And since the WACC has been adopted in the forecasting of firm's value in the non-explicit period, the tax effects of debt have already been taken into account in its formula decreasing the weighted average cost of capital: it followed that tax shields after 2019 had not to be explicitly calculated.

Furthermore, Stefanel will benefit from tax credits caused by past losses that is, the so-called tax loss carry-forwards. The Italian law which regulates tax loss carry-forwards is contained in art. 84 Tuir: a company can generate tax credits from tax loss carry-forwards within the limit of 80% of the taxable income in each subsequent year. The computations of the tax credits for the explicit period are displayed below. As for the calculation of tax shields, tax loss carry-forwards have been discounted back to 31/12/2014 by Stefanel's cost of debt. Finally it is worth noting that, for simplicity, it has been assumed that the entire accumulated tax loss carry-forwards remaining after the explicit projection period will be entirely compensated after 2019 and discounted back at the cost of debt.

The values of tax shields coming from interest expenses and of tax loss carry-forwards are illustrated in tables 4.15, 4.16 and 4.17.

Table 4.15 – PV of interest tax shields and tax loss carry-forwards (base case)

	BASE CASE						
Data in € mln (not the discount factor)							
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	
Interest expense (income)		4,0	4,5	4,4	4,3	4,3	
Marginal tax rate		27,5%	27,5%	27,5%	27,5%	27,5%	
Interest tax shield (ITS)		1,1	1,2	1,2	1,2	1,2	
Kd		13,6%	13,6%	13,6%	13,6%	13,6%	
Discount Factor		0,9	0,8	0,7	0,6	0,5	
Present value of Interest tax shields		1,0	1,0	0,8	0,7	0,6	
Present value of ITS$_{2015\text{-}2019}$	**4,1**						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**CV**
Net Loss (Income)		4,4	4,0	2,1	(0,1)	(1,7)	
Accumulated tax loss carry-forwards		4,4	8,3	10,4	10,3	8,6	8,6
Compensation (80% of annual Net Income)					0,1	1,3	8,6
Marginal tax rate		27,5%	27,5%	27,5%	27,5%	27,5%	27,5%
Tax savings					0,0	0,4	2,4
Kd		13,6%	13,6%	13,6%	13,6%	13,6%	
Discount Factor		0,9	0,8	0,7	0,6	0,5	
Present value of tax loss carry-forwards		0,0	0,0	0,0	0,0	0,2	1,3
Present value of tax loss carry-forwards$_{2015\text{-}2019}$	**1,5**						

Source: Personal elaboration

Table 4.16 – PV of interest tax shields and tax loss carry-forwards (best case)

	BEST CASE						
Data in € mln (not the discount factor)							
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	
Interest expense (income)		4,0	4,4	4,2	4,0	3,9	
Marginal tax rate		27,5%	27,5%	27,5%	27,5%	27,5%	
Interest tax shield (ITS)		1,1	1,2	1,2	1,1	1,1	
Kd		13,6%	13,6%	13,6%	13,6%	13,6%	
Discount Factor		0,9	0,8	0,7	0,6	0,5	
Present value of Interest tax shields		1,0	0,9	0,8	0,7	0,6	
Present value of ITS$_{2015-2019}$	**3,9**						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**CV**
Net Loss (Income)		4,4	3,4	0,8	(2,2)	(4,5)	
Accumulated tax loss carry-forwards		4,4	7,7	8,5	6,4	1,9	1,9
Compensation (80% of annual Net Income)					1,7	3,6	1,9
Marginal tax rate		27,5%	27,5%	27,5%	27,5%	27,5%	27,5%
Tax savings					0,5	1,0	0,5
Kd		13,6%	13,6%	13,6%	13,6%	13,6%	
Discount Factor		0,9	0,8	0,7	0,6	0,5	
Present value of tax loss carry-forwards		0,0	0,0	0,0	0,3	0,5	0,3
Present value of tax loss carry-forwards$_{2015-2019}$	**1,1**						

Source: Personal elaboration

Table 4.17 – PV of interest tax shields and tax loss carry-forwards (worst case)

Data in € mln (not the discount factor)							
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	
Interest expense (income)		4,0	4,6	4,6	4,7	4,9	
Marginal tax rate		27,5%	27,5%	27,5%	27,5%	27,5%	
Interest tax shield (ITS)		1,1	1,3	1,3	1,3	1,3	
Kd		13,6%	13,6%	13,6%	13,6%	13,6%	
Discount Factor		0,9	0,8	0,7	0,6	0,5	
Present value of Interest tax shields		1,0	1,0	0,9	0,8	0,7	
Present value of ITS$_{2015\text{-}2019}$	**4,3**						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**CV**
Net Loss (Income)		4,4	4,0	2,8	1,8	0,9	
Accumulated tax loss carry-forwards		4,4	8,4	11,2	13,1	14,0	14,0
Compensation (80% of annual Net Income)							14,0
Marginal tax rate		27,5%	27,5%	27,5%	27,5%	27,5%	27,5%
Tax savings					0,0	0,0	3,8
Kd		13,6%	13,6%	13,6%	13,6%	13,6%	
Discount Factor		0,9	0,8	0,7	0,6	0,5	
Present value of tax loss carry-forwards		0,0	0,0	0,0	0,0	0,0	2,0
Present value of tax loss carry-forwards$_{2015\text{-}2019}$	**2,0**						

The heading **WORST CASE** *appears centered above the table.*

Source: Personal elaboration

4.8 Distress costs

As illustrated by Damodaran (2002), one method to count for bankruptcy costs – although obviously in an imprecise way given the difficulty in measuring both direct and indirect costs – is based on multiplying the probability of default associated with the company's credit rating by the magnitude of costs in relation to the unlevered firm value.

Expected Costs = Probab of bankrputcy ∗ Cost of bankruptcy ∗ Unlevered firm value

The unlevered firm value refers to the value of the firm before considering the side effects of financing and other positive items: in our case is represented by the already calculated BEV, which is representative of the value of Stefanel's core operations. Recall that the 2014 credit ratings table developed by Damodaran has been previously displayed in table 4.10. Given that on 31/12/2014 Stefanel's interest coverage ratio

equals -0,6 that is, Stefanel is not even earning a positive operating income to cover the interest expenses on debts, Stefanel would have had a credit rating of D2 or D. In order to find out the corresponding default probability, Moody's 10 years average cumulative global default rates by rating have been studied.

Table 4.18 – Moody's 10 years average cumulative default probabilities by rating class (time period 1983-2008)

	Year 10 default rate
Aaa	0,19%
Aa1	0,16%
Aa2	0,48%
Aa3	0,47%
A1	1,08%
A2	2,21%
A3	1,80%
Baa1	2,09%
Baa2	4,29%
Baa3	6,52%
Ba1	11,12%
Ba2	13,37%
Ba3	29,60%
B1	36,72%
B2	39,11%
B3	53,68%
Caa1	62,34%
Caa2	61,74%
Caa3	82,02%
Ca-C	74,99%

Source: Personal elaboration from www.moodys.com/sites/products/DefaultResearch/2007400000578875.pdf

The D2 or D class generally indicates a company in default, thus the firm's default probability within 10 years would be 100%. Recalling the evidences shown in paragraph 1.7, we have set the direct costs at 5% of firm value; however, we also know that indirect costs are usually higher but less easily quantifiable. Thus, indirect costs have been assumed to correspond to 10% of firm value. The resulting total bankruptcy costs amounts to 15% of Stefanel pre-distress value, a percentage in line with most of the studies illustrated in paragraph 1.7.

Table 4.19 below displays the computation of distress costs for the three different case scenarios. It is worth noting that the bankruptcy costs are entirely borne by the company because its probability of default within 10 years resulted to be 100%.

Table 4.19 – Expected bankruptcy costs

Data in € mln

	BEV	Bankruptcy costs (% of BEV)	Expected bankruptcy costs
Best case scenario	134,7	15%	20,2
Base case scenario	82,2	15%	12,3
Worst case scenario	43,3	15%	6,5

Source: Personal elaboration

4.9 EV and market values of equity and debt

The EV on 31/12/2014 is the result of the sum of BEV, non-operating assets which at the end of 2014 amounted to €8,4 million, interest tax shields, tax loss carry-forwards, and distress costs. Then, the market value of equity has been obtained by subtracting the book value of NFP and debt equivalents – the book value of debt has been used as a proxy of the market value – and the market value of minority interest from the EV. In particular, on 31/12/2014 the NFP and debt equivalents totaled €76,7 million. For what concerns minorities, they have to be subtracted from the EV because they represent a claim on the assets of Stefanel's subsidiaries, thus they are exactly like debt claims. The calculation of the market value of minority interest is shown in the table below.

Table 4.20 – Calculation of market value of minority interest

Share value on 31/12/2014 (€)	0,3
Number of shares on 31/12/2014 (in €mln)	84,5
Market capitalization on 31/12/2014 (in €mln)	24,7
BV of Equity (incl. Minorities) on 31/12/2014 (in €mln)	10,8
P/BV on 31/12/2014	2,3
Minorities on 31/12/2014 (in €mln)	0,2
Minorities value on 31/12/2014 (in €mln)	**0,5**

Source: Personal elaboration

In turn, the EV and market value of equity in each different case scenario are displayed in Table 4.21.

Table 4.21 – EV and market value of equity for each case scenario

Data in € mln

	Base Case	Best Case	Worst Case
Value of operations	82,2	134,7	43,3
Non-operating assets	8,4	8,4	8,4
Tax shield effects	4,1	3,9	4,3
Value of tax loss carry-forwards	1,5	1,1	2,0
Distress costs	(12,3)	(20,2)	(6,5)
ENTERPRISE VALUE	**83,8**	**127,9**	**51,5**
Net financial position and debt equivalents	76,7	76,7	76,7
Minority interest	0,5	0,5	0,5
EQUITY VALUE	**6,6**	**50,7**	**0,0**

Source: Personal elaboration

In order to find out the market value of debt, it has been followed the procedure adopted by a previous practitioner, Cifani (2013). Accordingly, the market value of debt can be obtained by deducting the market value of equity from the EV, with the result that has then to be compared with the book value of debt, as illustrated by table 4.22.

Table 4.22 – Market value of debt

Data in € mln

	Base Case	Best Case	Worst Case
ENTERPRISE VALUE	**83,8**	**127,9**	**51,5**
NFP and debt equivalents	76,7	76,7	76,7
Minority interest	0,5	0,5	0,5
EQUITY VALUE	**6,6**	**50,7**	**0,0**
MARKET VALUE OF DEBT	**76,7**	**76,7**	**51,5**

Source: Personal elaboration

4.10 Expected values and sensitivity analysis

As already explained, in the case of valuation through the development of different case scenarios, a different probability of occurrence is attached to each case that is, to each set of underlying assumptions. In particular, it has been assumed that the base case, which represents Stefanel Group most probable future development since it is based on the assumptions and indications provided by the firm's management, has a probability of occurrence of 50%. The best case scenario, which represent more optimistic assumptions with respect to the base case, has just a 15% probability of occurrence: this is because the general principle of prudence has been adopted in this valuation. The same principle underlies the fact that the worst case scenario has a 35% probability of occurrence: this is also representative of the doubts concerning whether Stefanel will be able to successfully reposition the Stefanel brand or not. By applying these probabilities to the market values of assets, debts and equity computed before, the expected market values have been derived, as shown by figure 4.1.

Figure 4.1 – Stefanel expected values

Values in € mln			
	EV	Probability	Weighted EV value
Best case scenario	127,9	15%	19,2
Base case scenario	83,8	50%	41,9
Worst case scenario	51,5	35%	18,0
Expected EV value			**79,1**
	E	Probability	Weighted E value
Best case scenario	50,7	15%	7,6
Base case scenario	6,6	50%	3,3
Worst case scenario	0,0	35%	0,0
Expected Equity value			**10,9**
	D	Probability	Weighted D value
Best case scenario	76,7	15%	11,5
Base case scenario	76,7	50%	38,3
Worst case scenario	51,5	35%	18,0
Expected Debt value			**67,9**

Source: Personal elaboration

The expected value of Stefanel's assets has totaled €79,1 million, while the expected values of Stefanel's debts and equity have resulted to be respectively €67,9 million and €10,9 million.

In consideration of the expected value of Stefanel's equity, we have been able to compute the related value per share and compare it to its actual value on 31/12/2014.

Table 4.23 – Resulting Stefanel's share price

Data in € mln expect share prices

	Expected Market Value on 31/12/2014
EV	79,1
D	67,9
E	10,9
N of oustanding shares on 31/12/2014	84,5
Share price in € on 31/12/2014	€0,13
Actual share price in € on 31/12/2014	€0,29

Source: Personal elaboration

As it can be noticed in table 4.23, Stefanel's share price has resulted to be €0,13 which is approximately half of €0,29, the actual share price on 31/12/2014: this indicates that Stefanel's shares were presumably overvalued.

Finally, it had to be investigated how Stefanel's expected equity value changes with respect to movements in some input variables. Recall that on 31/12/2014 the risk-free interest rate adopted throughout the valuation process was incredibly low due to some exceptional circumstances: the risk-free interest rate is incorporated in the formulas for both the cost of equity and debt capital. Thus, several sensitivity analysis have been performed with respect to some key variables such as the cost of debt which had served to discount back to 31/12/14 interest tax shields and tax loss carry-forwards, the unlevered cost of capital which had been used to discount the FCFs in the explicit projection period, the WACC and growth rate of cash flows which had both been used in the calculation of the CV. Unsurprisingly, the variables which make Stefanel's expected equity value change more are the ones affecting the CV: in fact, the latter is responsible for approximately 80% of the EV. For this reason, the WACC is the first

variable that has been considered to vary; the second variable is the growth rate of cash flows in perpetuity. Table 4.24 shows Stefanel's expected equity value in relation to different pairs of WACC and g values.

Table 4.24 – Sensitivity analysis

Expected Value in € mln

Expected Equity Value		WACC									
		6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
g	0,0%	15,2	8,4	4,4	3,1	2,0	1,2	0,6	0,0	0,0	0,0
	0,5%	18,3	10,5	5,0	3,5	2,4	1,5	0,8	0,2	0,0	0,0
	1,0%	22,1	12,9	6,5	4,0	2,8	1,8	1,0	0,3	0,0	0,0
	1,5%	26,9	15,8	8,4	4,6	3,2	2,1	1,2	0,5	0,0	0,0
	2,0%	33,0	19,4	10,6	5,3	3,7	2,4	1,5	0,7	0,1	0,0
	2,5%	41,3	23,8	13,3	6,3	4,2	2,8	1,8	0,9	0,3	0,0
	3,0%	52,9	29,5	16,6	8,4	4,9	3,3	2,1	1,2	0,5	0,0
	3,5%	70,8	37,2	20,7	10,8	5,6	3,8	2,5	1,5	0,7	0,0
	4,0%	102,8	48,1	26,0	13,9	6,5	4,4	2,9	1,8	0,9	0,2
	4,5%	183,0	64,9	33,2	17,7	8,3	5,1	3,4	2,1	1,2	0,4
	5,0%	105,7	95,0	43,3	22,6	11,1	6,0	4,0	2,5	1,5	0,6
	5,5%	226,6	170,9	59,0	29,1	14,6	7,1	4,7	3,0	1,8	0,9

Source: Personal elaboration

As it can be easily noticed, Stefanel's expected equity value is lower the higher the difference between the WACC and g, since it will be higher the denominator in the CV formula.

5 Summary of results and final comments

The concept of distressed firm has proved to assume different shades, also because the term is used in day-to-day activities by ordinary people to refer to a company which is facing some sort of difficulties. This dissertation has tried to review the literature concerning this concept, and we have concluded that distress can be divided into two different notions: economic and financial distress. Economic distress is the result of operational problems and usually implies that the company has negative profitability margins and is facing net losses; instead, financial distress generally indicates a condition where the firm has failed to fulfill its debt obligations when they came due. Although with the term "distressed firm" it is often meant a financially distressed company, we have proved throughout the text that it is usually the case that a distressed firm presents both the characteristics of economic and financial distress, with the first that had provoked the latter.

A clear categorization of all possible causes of distress have been provided: potential problems may arise internally to the firm, thus they are specific to each company and endogenous because they both depend and are shaped by firm's decisions and actions; alternatively, potential problems may be the consequence of external causes, which in turn can affect only a specific industry or the entire economic system. In any case, we have also pinpointed how each distressed firm's path to crisis is specific and unique in the sense that it is often caused by a mixture of correlated and concatenated factors both at the firm internal and external level. Here is why it is has been repeatedly suggested to constantly analyze firm's business model and strategy in relation to the continuously changing external competitive environment: this process is fundamental both in the prevention and resolution of distress.

The tools provided by the Italian legislator to deal with distress have been displayed and compared: although these instruments can be distinguished between out-of-court workouts and in-court resolutions, we have highlighted that the majority of them have been designed with the aim of protecting firm's going-concern, thus shareholders are provided with more defensive rights with respect to credit holders.

An important fact usually overlooked when practitioners have discussed the distress phenomenon is that this stage of a company's life cycle entails also some interesting

benefits: among the others, the possibility of implementing radical changes in firm's management and governance as well as in the competitive strategy and business model – decisions which are usually avoided during the other phases of the life cycle – can be considered the major potential benefit.

Once the attention was turned to the economic valuation of this type of firms, it was clear that this has been and currently is a highly debated topic because it presents considerable difficulties, with many theoretical discussions and few practical solutions: in this respect, Damodaran appears to be the major provider of technical solutions to the problems that arise when main valuation models are applied to firms in distress.

We have highlighted that the economic valuation of a company in distress has the unique role of being the decision basis on which credit holders will determine the future of the firm itself. In fact, usually multiple valuations based on different future developments are carried out, with creditors choosing the most convenient alternative mainly from an economic point of view. Accordingly, the focus of valuation is often not the firm's equity but the value of the firm as a whole: this is because, as just explained, creditors are more interested in what a proposed turnover plan or course of action implies in terms of value creation. Thus, the choice of the valuation technique depends on the current level of distress of the firm: in fact, if the firm is in a irresolvable condition of economic and financial distress, there is no reason to consider any future plans based on the going-concern assumption.

In any case, the value of the company in case of liquidation is usually considered a benchmark value. In this respect, the adoption of asset approaches, which are normally seen as "inferior valuation methods", proves suitable to estimate the liquidation value of the firm and the corresponding value of equity. However, these approaches work when the liquidation value of assets is greater than the value of outstanding debts; when this is not the case, option-pricing models are the most suitable valuation techniques. Instead, when it has to be to estimated the value of a distressed firm under the assumption of going-concern, income approaches seems the most adequate. The problems associated with DCF models have been highlighted, especially the issues implied by the use of WACC. Although several possible solutions to make the DCF models adequate to value firms in distress have been illustrated, it appears that unlevered models that is, the APV

and CCF approaches, serve better the purpose. In particular, the APV model, with its ability to separate the value of firm's core operations from the effects of capital structure (and to discount their values back to the present at different required rates of return), coupled with its relative ease of application, seems the preferable valuation technique to value going-concern plans. For what concerns market approaches, their restrictive applicative conditions make them less suitable for the valuation of distressed companies. Finally, it has been showed how the use of Monte Carlo simulations can be very informative on the possible developments of future events (and of their associated probability of occurrence); however, the complexity of the underlying model and the amount of information that it needs in order to work are often considered overwhelming difficulties.

In order to implement the tools and subjects considered in the first two chapters of the dissertation, Stefanel S.p.A., an Italian listed clothing company currently in a condition of distress, has been analyzed and valued. As already explained, Stefanel has found itself in a distress situation as a result of a series of unfortunate choices and events as well as of some strategic and business model related inefficiencies. Also the impact on profitability of the apparel and fashion industry's forces, which has been assessed to be "strong", has contributed to bring about economic distress. In particular, going back to the early phases of the decline and crisis path, Stefanel asked for a huge loan of €150 million in 2006: from an ex-post perspective, that decision had proved to be unlucky because taken in an inappropriate historical moment that is, just before one of the most severe financial and economic crisis of the history. In fact, with the outbreak of the world economic crisis in 2007-2008, Stefanel was obliged to cope with both relevant economic losses and an high debt. Although the world economic downturn has been a decisive factor in accelerating and worsening the state of economic distress of the firm, the latter was also due to some erroneous strategic choices and actions implemented in the past. Among the others, it is worth mentioning:

- The decision to almost entirely outsource the production system: in fact, despite the fact that this business model ensures great flexibility and responsiveness to changing trends, it has placed the company's profitability in the hands of third parties. As a matter of fact, in this way a major part of Stefanel's EBITDA was

and is still absorbed by operating costs, without the company having the chance to rationalize these costs and adopt/improve best practices. Furthermore, in this way Stefanel is also more exposed to exchange rate risk: in particular with respect to the EUR/USD exchange rate, as highlighted several times in company's management reports, since the movements in this rate directly affect the purchasing cost of a great part of purchased and contracted works.

- The change of the sourcing areas of the Group's products towards the Far East, apparently with the aim of saving on the costs of labor and cloths. However, in the last two years sourcing policies have been modified again with the selection of suppliers in the East of Europe and Italy.

As a consequence, it has been detected, at least in Italy, a general consumers' misperception of the Stefanel brand both in terms of quality of clothes and brand image: this has been assessed through a questionnaire submitted to a group of people, with the results adjusted with the aid of information contained in some fashion blogs and forums. All these facts, together with the ineffectiveness of adopted counteractive actions and some illustrated inconsistencies between planned strategies throughout the years, have inevitably triggered also financial distress. Thus, Stefanel has been obliged to discuss its future with its creditors and to sign several Debts Restructuring Agreements – whose financial covenants have been repeatedly breached – as well as to continuously modify its Business Plan.

All these information have been taken into account in the valuation process and reflected in the firm's forecasted future results. With regard to this, one of the major objectives of this dissertation is to provide a detailed illustration of the process of distressed firm valuation. In particular, the APV method has been implemented in the explicit period of projection, while the common DCF perpetuity formula which relies on the WACC has been adopted to obtain the firm value after the explicitly considered period. The valuation has been based on the work of a previous practitioner, Cifani (2013): however, her approach has been revisited and enlarged. In fact all sources of value (core operations, tax shields, etc.) have been discounted back at their respective required rate of return, as implied by the theory underlying the APV method; furthermore, the valuation has accounted for tax loss carry-forwards (or so-called NOLs

that is, Net Operating losses) as well as for distress/bankruptcy costs. Particularly critical is the consideration of distress costs into the APV method, despite the fact that their approximation is quite challenging: this is the reason why, as explained by Damodaran (2002), distress costs are usually omitted by practitioners, with the obtained firm value that inevitably results to be overestimated.

The performed valuation have returned an expected market value of Stefanel's equity on 31/12/2014 of €10,9 million, for a corresponding share value of €0,13: comparing the latter with the actual share price on 31/12/2014 (€ 0,29) it seems that shares were overvalued. In fact, the obtained share price appears to reflect all the doubts and considerations concerning Stefanel's future which have been highlighted throughout the analysis of its history and current situation, its business strategy and business model as well as its competitive environment:

a) Stefanel's equity capital has been almost entirely eroded, so it will be crucial for the company to raise interest-free capital in the near future. In this respect, Stefanel has already instructed its financial advisor Rothschild to start a process aimed at identifying and structuring possible operations for the strengthening of the company's capital structure even – eventually – through the identification of potential partners: and, in this sense, it is reassuring that non-binding offers have already been submitted by some interested parties.

b) Stefanel's competitive strategy and latest business plan are mainly based on the reposition of the Stefanel brand into an higher and thus more lucrative market segment: even though there may be doubts about the company's ability to successfully reposition the Stefanel brand, the major concerns are related to the fact that changing the brand image in the eyes of customers is usually a process which takes many years to be achieved and completed and which has to be matched by an adequate amount of investments. Accordingly, new funds are needed also to complete the planned strategic actions for the reposition of the Stefanel brand.

c) Stefanel has already sold a series of assets considered no more strategic for the Group activities in order to cope with liquidity problems: recall the divestiture of Hallhuber GmbH, a subsidiary which in 2008 formed a Group's SBU and was

responsible for €59,6 million in sales, as well as the sale of the 50% stake of equity investment in Noel International S.A., which in turn owned the 100% of The Nuance Group, leader in the airport retail sector. Looking at company's consolidated financial statements, it seems that Stefanel has run out of assets which can be sold, thus it will have to find new sources of financing in case of future liquidity problems.

d) Although the company has paid an average of €5 million of annual interests on debt in the last seven years, its profitability margins have showed relevant improvements, with the calculated FCF that has returned positive in the last two years: this is an important fact, because it means that Stefanel Group's core activities are not "burning" cash anymore.

e) During the last years Stefanel has breached several times the financial covenants and other debts related obligations: in the case it happens again in the future, the financial institutions will probably guarantee their support to the company as already occurred in the past, also in consideration of the arguments in point d). This fact will be absolutely critical for the company's future going-concern, as underlined many times by Stefanel's management in the annual reports.

Appendix

Appendix 1 – Income Statement as reported

Data in € mln

INCOME STATEMENT AS REPORTED	2008	2009	2010	2011	2012	2013	2014
Sales of goods and services	**275,4**	**181,9**	**182,9**	**193,6**	**186,6**	**168,5**	**155,6**
Raw materials, consumables, goods and services	(110,1)	(79,8)	(76,7)	(84,5)	(84,7)	(76,0)	(62,8)
Advertising and promotions	(12,0)	(9,7)	(15,0)	(15,2)	(11,1)	(5,6)	(3,7)
SG&A	(151,4)	(126,5)	(117,6)	(114,3)	(94,0)	(96,1)	(83,4)
GROSS OPERATING INCOME	**1,8**	**(34,1)**	**(26,5)**	**(20,5)**	**(3,2)**	**(9,2)**	**5,7**
Depreciation, amortisation and impairment losses	(13,1)	(16,5)	(9,8)	(18,2)	(13,5)	(11,7)	(8,6)
NET OPERATING INCOME	**(11,3)**	**(50,6)**	**(36,3)**	**(38,7)**	**(16,7)**	**(20,8)**	**(3,0)**
Net interest income (expense)	(12,2)	(7,0)	(3,7)	(5,7)	(3,6)	(4,4)	(5,2)
Income (expense) from equity investments	4,3	(0,1)	0,0	0,0	(0,1)	(0,4)	(0,1)
RESULT BEFORE TAXES	**(19,3)**	**(57,6)**	**(39,9)**	**(44,4)**	**(20,4)**	**(25,6)**	**(8,2)**
Taxes	(2,0)	1,1	0,1	1,1	(0,4)	(1,7)	0,5
NET PROFIT OF CONTINUING OPERATIONS	**(21,3)**	**(56,6)**	**(39,8)**	**(43,3)**	**(20,8)**	**(27,3)**	**(7,7)**
Income from disposal of assets held for sale and from discontinued oper	0,5	8,0	4,5	57,9	0,7	3,5	0,0
NET RESULT	**(20,8)**	**(48,6)**	**(35,3)**	**14,6**	**(20,1)**	**(23,8)**	**(7,7)**
attributable to:							
Shareholders of the parent company	**(20,8)**	**(48,7)**	**(35,4)**	**14,4**	**(20,2)**	**(24,0)**	**(7,8)**
Minority interests	**(0,0)**	**0,1**	**0,1**	**0,2**	**0,1**	**0,1**	**0,2**
Basic/Diluted earnings per share (€)	**(0,20)**	**(0,30)**	**(0,91)**	**0,17**	**(0,24)**	**(0,28)**	**(0,09)**

Appendix 2 – Balance Sheet as reported

Data in € mln

BALANCE SHEET AS REPORTED	2008	2009	2010	2011	2012	2013	2014
NON-CURRENT ASSETS							
Tangible fixed asstes	50,2	35,8	39,3	38,1	32,8	27,0	23,1
Intangible fixed assets	57,9	46,7	45,3	41,7	35,1	31,4	27,2
Shareholdings valued using the equity method	11,5	15,8	0,3	0,2	0,6	0,5	0,5
Financial assets and other non-current assets	47,4	51,1	0,0	0,0	0,1	0,3	0,2
Other receivables and non-current assets	17,1	12,1	10,6	10,7	10,6	5,8	6,7
Deferred tax assets	6,7	7,2	7,5	8,3	7,7	7,5	9,4
TOTAL NON-CURRENT ASSETS	**190,8**	**168,8**	**102,9**	**99,0**	**86,8**	**72,4**	**67,1**
CURRENT ASSETS							
Inventories	52,7	40,7	44,5	54,8	51,4	46,2	47,4
Trade receivables	24,2	23,4	24,1	25,5	41,2	32,2	24,4
Other receivables and current assets	18,2	16,9	20,0	18,5	14,3	16,3	12,3
financial assets and other current assets	0,1	1,1	2,4	1,7	0,0	0,6	0,9
Cash and cash equivalents	27,0	17,3	25,9	31,3	11,7	8,1	12,1
TOTAL CURRENT ASSETS	**122,1**	**99,5**	**117,0**	**131,8**	**118,6**	**103,5**	**97,0**
ASSETS HELD FOR SALE	**0,0**	**0,0**	**75,6**	**0,0**	**0,0**	**0,0**	**2,2**
TOTAL ASSETS	**312,9**	**268,2**	**295,5**	**230,8**	**205,4**	**176,0**	**166,3**

Appendix 3 – Balance Sheet as reported (continued)

Data in € mln

BALANCE SHEET AS REPORTED - continued	2008	2009	2010	2011	2012	2013	2014
GROUP EQUITY							
Share capital	88,9	88,9	97,5	97,5	55,2	27,0	27,0
Other reserves	14,1	(1,8)	(10,8)	(46,4)	9,5	(8,7)	(9,2)
Other equity components	0,0	0,0	0,0	0,0	0,0	(0,6)	(0,5)
Retained earnings/(losses)	0,0	0,0	0,0	0,0	0,0	1,1	(6,8)
Profit (loss) for the year	(20,8)	(48,7)	(35,4)	14,4	(20,2)	0,0	0,0
Total group equity	**82,2**	**38,4**	**51,3**	**65,6**	**44,5**	**18,8**	**10,6**
Total minority interest	**0,3**	**0,4**	**0,2**	**0,3**	**0,5**	**0,2**	**0,2**
Total equity	**82,5**	**38,8**	**51,5**	**65,9**	**44,9**	**19,0**	**10,8**
NON-CURRENT LIABILITIES							
Non-current financial liabilities	14,4	10,9	0,6	28,6	40,5	0,0	51,0
Other non-current liabilities	0,0	0,0	0,4	0,2	0,0	0,0	0,4
Non-current provisions	2,9	3,2	3,1	2,2	2,5	3,2	3,6
Provisions for employee benefits	6,2	5,6	5,0	4,6	3,8	3,8	2,6
Deferred tax liabilities	5,7	5,0	4,9	4,4	3,7	3,6	4,3
Total non-current liabilities	**29,2**	**24,6**	**14,0**	**40,0**	**50,6**	**10,6**	**61,9**
CURRENT LIABILITIES							
Current financial liabilities	133,3	138,9	154,6	40,2	39,2	84,6	35,1
Trade payables	52,4	52,0	59,6	68,9	58,7	51,0	45,9
Current provisions	0,6	2,0	1,6	1,4	0,2	0,4	0,4
Other payables and current liabilities	14,9	12,0	14,1	14,4	11,8	10,5	12,2
Total current liabilities	**201,3**	**204,8**	**229,9**	**124,9**	**109,9**	**146,4**	**93,6**
Total liabilities	**230,5**	**229,5**	**244,0**	**164,9**	**160,5**	**157,0**	**155,5**
TOTAL EQUITY AND LIABILITIES	**312,9**	**268,2**	**295,5**	**230,8**	**205,4**	**176,0**	**166,3**

Appendix 4 – Reorganized Balance Sheet (Invested Capital)

Data in € mln

REORGANIZED BALANCE SHEET (INVESTED CAPITAL)	2008	2009	2010	2011	2012	2013	2014
Working cash*	5,5	3,6	3,7	3,9	3,7	3,4	3,1
Trade receivables	24,2	23,4	24,1	25,5	41,2	32,2	24,4
Inventories	52,7	40,7	44,5	54,8	51,4	46,2	47,4
Trade payables	(52,4)	(52,0)	(59,6)	(68,9)	(58,7)	(51,0)	(45,9)
Trade working capital	**29,9**	**15,8**	**12,6**	**15,3**	**37,6**	**30,8**	**29,0**
Other operating current assets	17,2	15,6	16,1	13,0	13,2	11,8	9,3
Other operating current liabilities	(13,5)	(14,0)	(15,5)	(15,8)	(9,7)	(9,2)	(8,6)
Other current assets and liabilities	**3,7**	**1,7**	**0,6**	**(2,8)**	**3,5**	**2,6**	**0,7**
Net working capital	**33,6**	**17,5**	**13,2**	**12,5**	**41,2**	**33,4**	**29,8**
Tangible assets	50,2	35,8	39,3	38,1	32,8	27,0	23,1
Operating intangibles	3,6	3,5	3,0	3,1	2,3	1,5	1,1
Total operating fixed capital	**53,8**	**39,3**	**42,2**	**41,1**	**35,1**	**28,5**	**24,2**
Operating receivables and other non-current assets	4,6	4,1	3,9	0,9	0,6	0,4	2,0
Operating deferred tax assets (liabilities)	1,0	1,1	0,5	1,8	1,9	1,7	0,6
Operating non-current liabilities	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Operating provisions	(2,9)	(3,2)	(3,1)	(2,2)	(2,5)	(3,2)	(3,6)
Total other non-current operating assets and liabilities	**2,7**	**1,9**	**1,4**	**0,4**	**(0,0)**	**(1,0)**	**(0,9)**
Invested capital excluding goodwill and similar intangibles	**90,1**	**58,7**	**56,8**	**54,0**	**76,2**	**60,9**	**53,0**

Appendix 5 – Reorganized Balance Sheet (Invested Capital) (continued)

Goodwill and similar intangibles	54,3	43,2	42,3	38,6	32,8	29,9	26,1
Deferred tax asset (liabilities) on similar intangibles	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Goodwill and other similar intangibles	**54,3**	**43,2**	**42,3**	**38,6**	**32,8**	**29,9**	**26,1**
Invested capital including goodwill and similar intangibles	**144,4**	**101,9**	**99,1**	**92,6**	**109,0**	**90,8**	**79,1**
Non-operating current assets	1,0	1,3	4,0	5,4	1,1	4,5	3,0
Other non-operating current liabilities	(2,0)	0,0	(0,2)	0,0	(2,3)	(1,6)	(4,1)
Non-operating non-current assets	71,4	74,9	7,1	10,1	10,7	6,2	5,4
Non-operating deferred tax assets (liabilities)	0,0	1,2	2,0	2,2	2,1	2,1	4,5
Non-operating non-current liabilities	0,0	0,0	(0,4)	(0,2)	0,0	0,0	(0,4)
Non-operating assets	**70,5**	**77,4**	**12,4**	**17,5**	**11,5**	**11,2**	**8,4**
Total funds invested	**214,9**	**179,3**	**111,5**	**110,1**	**120,5**	**102,0**	**87,5**

Appendix 6 – Reorganized Balance Sheet (Sources of Financing)

Data in € mln

REORGANIZED BALANCE SHEET (SOURCES OF FINANCING)	2008	2009	2010	2011	2012	2013	2014
Excess cash	(21,5)	(14,8)	(24,7)	(29,2)	(8,0)	(5,4)	(9,8)
Assets held for sale	0,0	0,0	(75,6)	0,0	0,0	0,0	(2,2)
Long-term borrowings	14,4	10,9	0,6	28,6	40,5	0,0	51,0
Short-term borrowings	133,3	138,9	154,6	40,2	39,2	84,6	35,1
Net financial position	**126,2**	**135,0**	**55,0**	**39,7**	**71,7**	**79,2**	**74,0**
Provision for employee benefit	6,2	5,6	5,0	4,6	3,8	3,8	2,6
Non-operating provisions	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Debt equivalents	**6,2**	**5,6**	**5,0**	**4,6**	**3,8**	**3,8**	**2,6**
Net financial position and debt equivalents	**132,4**	**140,5**	**60,0**	**44,2**	**75,6**	**83,0**	**76,7**
Minority interests	**0,3**	**0,4**	**0,2**	**0,3**	**0,5**	**0,2**	**0,2**
Shareholders' equity	**82,2**	**38,4**	**51,3**	**65,6**	**44,5**	**18,8**	**10,6**
Total sources of financing	**214,9**	**179,3**	**111,5**	**110,1**	**120,5**	**102,0**	**87,5**

Appendix 7 – Reorganized Income Statement

Data in € mln

REORGANIZED INCOME STATEMENT	2008	2009	2010	2011	2012	2013	2014
Revenues	**275,4**	**181,9**	**182,9**	**193,6**	**186,6**	**168,5**	**155,6**
Operating cost (personnel and D&A excluded):	(222,9)	(172,7)	(168,5)	(173,2)	(151,6)	(145,9)	(120,2)
Raw materials, consumables, goods and services	*(110,1)*	*(79,8)*	*(76,7)*	*(84,5)*	*(84,7)*	*(76,0)*	*(62,8)*
Advertising and promotions	*(12,0)*	*(9,7)*	*(15,0)*	*(15,2)*	*(11,1)*	*(5,6)*	*(3,7)*
Other operating costs	*(100,7)*	*(83,3)*	*(76,7)*	*(73,4)*	*(55,8)*	*(64,2)*	*(53,6)*
Personnel expenses	(50,7)	(43,3)	(40,9)	(40,9)	(38,2)	(31,8)	(29,8)
EBITDA	**1,8**	**(34,1)**	**(26,5)**	**(20,5)**	**(3,2)**	**(9,2)**	**5,7**
Total D&A	(11,5)	(9,0)	(7,9)	(8,1)	(8,1)	(6,8)	(5,7)
Depreciation	*(11,1)*	*(8,6)*	*(7,4)*	*(7,6)*	*(7,4)*	*(6,1)*	*(5,2)*
Amortization of operating intangibles	*(0,4)*	*(0,4)*	*(0,5)*	*(0,6)*	*(0,7)*	*(0,7)*	*(0,5)*
EBITA	**(9,7)**	**(43,1)**	**(34,4)**	**(28,7)**	**(11,3)**	**(16,0)**	**(0,1)**
Amortization of assets similar to goodwill	(1,1)	(0,8)	(1,2)	(2,3)	(2,0)	(1,5)	(1,7)
EBIT	**(10,8)**	**(43,8)**	**(35,6)**	**(31,0)**	**(13,2)**	**(17,5)**	**(1,8)**
Impairment losses	(0,5)	(6,7)	(0,7)	(7,8)	(3,4)	(3,3)	(1,2)
Non-recurring and extraordinary items	0,5	8,0	4,5	57,9	0,7	3,5	0,0
Interest income (expense) from equity investments	4,3	(0,1)	0,0	0,0	(0,1)	(0,4)	(0,1)
Net financial result:	(12,2)	(7,0)	(3,7)	(5,7)	(3,6)	(4,4)	(5,2)
Exchange rate (losses) gains	*(1,8)*	*(0,6)*	*1,9*	*(1,2)*	*(0,0)*	*(1,2)*	*(0,6)*
Interest (expense) income	*(10,4)*	*(6,4)*	*(5,5)*	*(4,5)*	*(3,6)*	*(3,3)*	*(4,6)*
EBT	**(18,8)**	**(49,6)**	**(35,4)**	**13,5**	**(19,7)**	**(22,1)**	**(8,2)**
Taxes	(2,0)	1,1	0,1	1,1	(0,4)	(1,7)	0,5
Net Income	**(20,8)**	**(48,6)**	**(35,3)**	**14,6**	**(20,1)**	**(23,8)**	**(7,7)**
Minority result	(0,0)	0,1	0,1	0,2	0,1	0,1	0,2
Group Net Income	**(20,8)**	**(48,7)**	**(35,4)**	**14,4**	**(20,2)**	**(24,0)**	**(7,8)**

Appendix 8 – Free Cash Flow calculation

Data in € mln

FREE CASH FLOW CALCULATION	2008	2009	2010	2011	2012	2013	2014
NOPLAT		(41,7)	(34,2)	(11,7)	(13,1)	(18,3)	(1,5)
Amortization of operating intangibles		0,4	0,5	0,6	0,7	0,7	0,5
Depreciation		8,6	7,4	7,6	7,4	6,1	5,2
Gross cash flow		(32,7)	(26,3)	(3,6)	(5,0)	(11,5)	4,2
Change in operating working capital		16,1	4,3	0,7	(28,7)	7,7	3,7
Net capital expenditures		5,5	(10,8)	(7,0)	(2,0)	(0,2)	(1,4)
Change in other operating assets and liabilities		0,8	0,5	1,0	0,4	1,0	(0,1)
Gross investment		22,4	(6,0)	(5,3)	(30,3)	8,5	2,2
Free cash flow before goodwill and similar intangibles		(10,2)	(32,3)	(8,9)	(35,3)	(3,0)	6,4
Investments in goodwill and other intangibles		10,3	(0,3)	1,4	3,8	1,4	2,1
Free cash flow after goodwill and similar intangibles		0,1	(32,7)	(7,5)	(31,4)	(1,6)	8,5
Investments in non-operating assets		(7,0)	65,0	(5,1)	6,1	0,3	2,8
Impairment losses		(6,7)	(0,7)	(7,8)	(3,4)	(3,3)	(1,2)
Non-recurring and extraordinary items		8,0	4,5	57,9	0,7	3,5	0,0
Interest income (expense) from investments		(0,1)	0,0	0,0	(0,1)	(0,4)	(0,1)
Non-operating taxes		(0,4)	(0,0)	(15,9)	1,4	0,6	2,0
Change in debt equivalents		(0,7)	(0,5)	(0,5)	(0,7)	(0,1)	(1,2)
Non-operating cash flow		(6,8)	68,3	28,7	3,9	0,6	2,3
Cash available to investors		(6,7)	35,6	21,2	(27,6)	(1,0)	10,8
Net financial result		(7,0)	(3,7)	(5,7)	(3,6)	(4,4)	(5,2)
Change in minority interests		(0,0)	(0,3)	(0,0)	0,0	(0,4)	(0,1)
Change in shareholders' equity		4,9	48,3	(0,1)	(0,9)	(1,7)	(0,4)
Decrease (increase) in net financial position		(8,8)	80,0	15,3	(32,0)	(7,5)	5,2
Beginning net financial position		126,2	135,0	55,0	39,7	71,7	79,2
Ending net financial position		135,0	55,0	39,7	71,7	79,2	74,0

Appendix 9 – Profitability ratios and Growth rates

PROFITABILITY RATIOS	2008	2009	2010	2011	2012	2013	2014
ROA	-6,6%	-18,1%	-12,0%	6,2%	-9,8%	-13,6%	-4,7%
ROE	-25,3%	-80,7%	-78,8%	24,6%	-36,7%	-75,7%	-53,2%
ROIC	-10,6%	-33,8%	-34,1%	-12,2%	-13,0%	-18,3%	-1,7%
Premium over book capital	1,60	1,65	1,74	1,73	1,55	1,46	1,49
ROIC without goodwill	-16,9%	-56,0%	-59,3%	-21,1%	-20,1%	-26,7%	-2,6%
Pretax ROIC	-10,7%	-57,9%	-59,5%	-51,7%	-17,3%	-23,3%	-0,1%
Operating margin (ROS)	-3,5%	-23,7%	-18,8%	-14,8%	-6,0%	-9,5%	0,0%
Revenues/invested capital	3,05	2,44	3,16	3,49	2,87	2,46	2,73
Net working capital/revenues	12,2%	14,0%	8,4%	6,6%	14,4%	22,1%	20,3%
Operating fixed assets/revenues	19,6%	25,6%	22,3%	21,5%	20,4%	18,9%	16,9%

GROWTH RATES	2008	2009	2010	2011	2012	2013	2014
Revenues		-33,9%	0,5%	5,9%	-3,6%	-9,7%	-7,7%
EBITDA		-1988,9%	22,3%	22,5%	84,4%	-186,1%	161,8%
EBITA		-344,8%	20,2%	16,6%	60,7%	-42,1%	99,7%
NOPAT		-172,7%	17,8%	65,8%	-11,6%	-40,2%	91,9%
IC		-29,4%	-2,7%	-6,6%	17,7%	-16,7%	-12,9%
IC excluding goodwill		-34,8%	-3,2%	-5,0%	41,1%	-20,1%	-13,0%
Net working capital		-48,0%	-24,5%	-5,3%	229,2%	-18,8%	-11,0%
Operating fixed capital		-26,9%	7,4%	-2,6%	-14,6%	-18,8%	-15,3%

Appendix 10 – Working Capital Management, Financial Structure ratios, Coverage ratios

WORKING CAPITAL MANAGEMENT (Days in revenues)	2008	2009	2010	2011	2012	2013	2014
Working Cash	7	7	7	7	7	7	7
Receivables	32	47	48	48	81	70	57
Inventories	70	82	89	103	101	100	111
Suppliers	70	104	119	130	115	110	108
Other current assets and liabilities	(5)	(3)	(1)	5	(7)	(6)	(2)
Net working capital	45	35	26	24	80	72	70

FINANCIAL STRUCTURE RATIOS	2008	2009	2010	2011	2012	2013	2014
NFP/Equity	1,6	3,6	1,2	0,7	1,7	4,4	7,1
NFP/EBITA	(13,7)	(3,3)	(1,7)	(1,5)	(6,7)	(5,2)	(1474,3)
NFP/EBITDA	73,4	(4,1)	(2,3)	(2,2)	(23,6)	(9,1)	13,5

COVERAGE RATIOS	2008	2009	2010	2011	2012	2013	2014
Current ratio	0,61	0,49	0,51	1,06	1,08	0,71	1,04
Quick (acid-test) ratio	0,01	0,04	0,00	-0,03	0,30	0,18	0,16
EBIT/interest	(1,1)	(7,9)	(6,6)	(8,7)	(4,7)	(6,4)	(0,6)
EBITA/interest	(0,9)	(6,8)	(6,3)	(6,4)	(3,2)	(4,9)	(0,0)
EBITDA/interest	0,2	(5,3)	(4,8)	(4,6)	(0,9)	(2,8)	1,2
Cash available for investors/NFP		-4,8%	59,3%	47,8%	-36,5%	-1,2%	14,1%
FCF from operation/NFP		0,1%	-54,4%	-17,0%	-41,6%	-1,9%	11,1%

Appendix 11 – Projected BS (invested capital) in base case scenario

Data in € mln

			BASE CASE		
PROJECTED BALANCE SHEET (INVESTED CAPITAL)	**2015**	**2016**	**2017**	**2018**	**2019**
Working cash*	3,1	3,2	3,3	3,4	3,5
Trade receivables	27,0	27,4	28,1	29,0	30,0
Inventories	46,8	46,6	46,8	46,0	45,7
Trade payable	(55,3)	(56,2)	(57,5)	(59,3)	(61,4)
Trade working capital	**21,7**	**21,0**	**20,6**	**19,0**	**17,7**
Other current assets and liabilities	**2,3**	**2,3**	**2,3**	**2,3**	**2,3**
Net working capital	**23,9**	**23,3**	**22,9**	**21,2**	**20,0**
Total operating fixed capital	**22,8**	**22,9**	**23,1**	**23,3**	**23,5**
Total other non-current operating assets and liabilities	**(1,0)**	**(1,0)**	**(1,0)**	**(1,0)**	**(1,0)**
Invested capital excluding goodwill and similar intangibles	**45,8**	**45,2**	**45,0**	**43,5**	**42,5**
Goodwill and other similar intangibles	**28,7**	**29,5**	**30,2**	**30,2**	**30,2**
Invested capital including goodwill and similar intangibles	**74,5**	**74,7**	**75,2**	**73,7**	**72,7**
Non-operating assets	**16,8**	**16,8**	**16,8**	**16,8**	**16,8**
Total funds invested	**91,3**	**91,5**	**92,1**	**90,5**	**89,5**

Appendix 12 – Projected BS (sources of financing) in base case scenario

Data in € mln					
		BASE CASE			
PROJECTED BALANCE SHEET (SOURCES OF FINANCING)	**2015**	**2016**	**2017**	**2018**	**2019**
Net financial position	82,8	82,0	79,7	78,1	75,4
Debt equivalents	2,2	2,2	2,2	2,2	2,2
Net financial position and debt equivalents	85,0	84,2	81,9	80,3	77,6
Minority interests	0,2	0,2	0,2	0,2	0,2
Shareholders' equity	6,1	7,1	9,9	10,0	11,6
Total sources of financing	91,3	91,5	92,1	90,5	89,5

Appendix 13 – Projected IS in base case scenario

Data in € mln

			BASE CASE			
PROJECTED INCOME STATEMENT	**2015**	**2016**	**2017**	**2018**	**2019**
Revenues	**156,7**	**158,9**	**162,8**	**167,7**	**173,7**
Operating cost (personnel and D&A excluded):	(123,0)	(124,7)	(126,2)	(128,3)	(131,8)
Raw materials, consumables, goods and services	(64,3)	(65,2)	(65,9)	(67,1)	(68,9)
Advertising and promotions	(3,8)	(3,9)	(3,9)	(4,0)	(4,1)
Other operating costs	(54,9)	(55,7)	(56,3)	(57,3)	(58,8)
Personnel expenses	(29,1)	(28,6)	(28,3)	(27,8)	(27,8)
EBITDA	**4,6**	**5,6**	**8,3**	**11,6**	**14,1**
Total D&A	(4,8)	(4,7)	(4,7)	(4,8)	(5,0)
Depreciation	(4,4)	(4,3)	(4,3)	(4,4)	(4,6)
Amortization of operating intangibles	(0,4)	(0,4)	(0,4)	(0,4)	(0,4)
EBITA	**(0,3)**	**0,9**	**3,6**	**6,7**	**9,1**
Amortization of assets similar to goodwill	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
EBIT	**(1,9)**	**(0,8)**	**1,9**	**5,0**	**7,3**
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from equity investments	0,1	0,1	0,1	0,1	0,1
Net financial result:	(5,0)	(5,5)	(5,4)	(5,3)	(5,3)
Exchange rate (losses) gains	(1,0)	(1,0)	(1,0)	(1,0)	(1,0)
Interest (expense) income	(4,0)	(4,5)	(4,4)	(4,3)	(4,3)
EBT	**(6,4)**	**(5,8)**	**(3,0)**	**0,2**	**2,6**
Taxes	2,0	1,8	0,9	(0,1)	(0,9)
Net Income	**(4,4)**	**(4,0)**	**(2,1)**	**0,1**	**1,7**
Minority result	(0,1)	(0,1)	(0,0)	0,0	0,0
Group Net Income	**(4,4)**	**(4,0)**	**(2,1)**	**0,1**	**1,7**

Appendix 14 – FCF calculation in base case scenario

Data in € mln

			BASE CASE		
FREE CASH FLOW CALCULATION	2015	2016	2017	2018	2019
NOPLAT	(0,2)	0,6	2,5	4,6	6,2
Amortization of operating intangibles	0,4	0,4	0,4	0,4	0,4
Depreciation	4,4	4,3	4,3	4,4	4,6
Gross cash flow	4,7	5,3	7,2	9,5	11,2
Change in operating working capital	5,8	0,6	0,4	1,7	1,2
Net capital expenditures	(3,5)	(4,8)	(4,9)	(5,0)	(5,2)
Change in other operating assets and liabilities	0,1	0,0	0,0	0,0	0,0
Gross investment	2,4	(4,1)	(4,5)	(3,4)	(4,0)
Free cash flow before goodwill and similar intangibles	7,1	1,2	2,7	6,1	7,2
Investments in goodwill and other intangibles	(4,3)	(2,4)	(2,4)	(1,7)	(1,7)
Free cash flow after goodwill and similar intangibles	2,7	(1,2)	0,2	4,4	5,5
Investments in non-operating assets	(8,4)	0,0	0,0	0,0	0,0
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Non-operating taxes	1,9	2,0	2,0	2,0	2,0
Change in debt equivalents	(0,4)	0,0	0,0	0,0	0,0
Non-operating cash flow	(6,4)	2,5	2,5	2,5	2,5
Cash available to investors	(3,7)	1,3	2,7	6,9	8,0
Net financial result	(5,0)	(5,5)	(5,4)	(5,3)	(5,3)
Change in minority interests	0,1	0,1	0,0	(0,0)	(0,0)
Change in shareholders' equity	(0,1)	4,9	4,9	(0,0)	0,0
Decrease (increase) in net financial position	(8,8)	0,8	2,3	1,6	2,7
Beginning net financial position	74,0	82,8	82,0	79,7	78,1
Ending net financial position	82,8	82,0	79,7	78,1	75,4

Appendix 15 – NOPLAT calculation in base case scenario

Data in € mln					
BASE CASE					
NOPLAT CALCULATION	**2015**	**2016**	**2017**	**2018**	**2019**
EBITA	**(0,3)**	**0,9**	**3,6**	**6,7**	**9,1**
Operating taxes*	0,1	(0,3)	(1,1)	(2,1)	(2,8)
NOPLAT	**(0,2)**	**0,6**	**2,5**	**4,6**	**6,2**
EBT	(6,4)	(5,8)	(3,0)	0,2	2,6
Income taxes	2,0	1,8	0,9	(0,1)	(0,9)
Actual (blended global) tax rate	**30,8%**	**30,4%**	**29,6%**	**56,3%**	**33,3%**
Adjustments:					
Amortization of assets similar to goodwill	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
Estimated tax rate	31,4%	31,4%	31,4%	31,4%	31,4%
Taxes	0,5	0,5	0,5	0,5	0,5
Impairment losses	0,4	0,4	0,4	0,4	0,4
Estimated tax rate	0,0%	0,0%	0,0%	0,0%	0,0%
Taxes	0,0	0,0	0,0	0,0	0,0
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Estimated tax rate	31,4%	31,4%	31,4%	31,4%	31,4%
Taxes	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Estimated tax rate	0,0%	0,0%	0,0%	0,0%	0,0%
Taxes	0,0	0,0	0,0	0,0	0,0
Net financial result	(5,0)	(5,5)	(5,4)	(5,3)	(5,3)
Estimated tax rate	27,5%	27,5%	27,5%	27,5%	27,5%
Taxes	1,4	1,5	1,5	1,5	1,4
Estimated taxes on EBITA	0,1	(0,3)	(1,1)	(2,1)	(2,8)
EBITA	(0,3)	0,9	3,6	6,7	9,1
Estimated tax rate on EBITA	**31,4%**	**31,4%**	**31,4%**	**31,4%**	**31,4%**
Taxes on EBITA	0,1	(0,3)	(1,1)	(2,1)	(2,8)
Adjustments on taxes	1,9	2,0	2,0	2,0	2,0
Taxes on EBT	2,0	1,8	0,9	(0,1)	(0,9)

Appendix 16 – Reconciliation of NOPLAT with Net Profit in base case scenario

Data in € mln

Reconciliation of NOPLAT with Net Profit	BASE CASE 2015	2016	2017	2018	2019
NOPLAT	**(0,2)**	**0,6**	**2,5**	**4,6**	**6,2**
Amortization of goodwill and other similar intangibles	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Net financial result	(5,0)	(5,5)	(5,4)	(5,3)	(5,3)
Non-operating taxes	1,9	2,0	2,0	2,0	2,0
Minority result	0,1	0,1	0,0	(0,0)	(0,0)
Group Net Income	**(4,4)**	**(4,0)**	**(2,1)**	**0,1**	**1,7**

Appendix 17 – Projected BS (invested capital) in best case scenario

Data in € mln

			BEST CASE		
PROJECTED BALANCE SHEET (INVESTED CAPITAL)	**2015**	**2016**	**2017**	**2018**	**2019**
Working cash*	3,1	3,2	3,3	3,4	3,6
Trade receivables	27,0	26,2	25,6	25,6	25,3
Inventories	46,8	46,3	46,3	46,6	47,3
Trade payable	(55,3)	(56,3)	(58,0)	(60,1)	(62,8)
Trade working capital	**21,7**	**19,3**	**17,2**	**15,5**	**13,3**
Other current assets and liabilities	**2,3**	**2,3**	**2,3**	**2,3**	**2,3**
Net working capital	**23,9**	**21,6**	**19,5**	**17,8**	**15,6**
Total operating fixed capital	**22,8**	**22,9**	**23,1**	**23,4**	**23,7**
Total other non-current operating assets and liabilities	**(1,0)**	**(1,0)**	**(1,0)**	**(1,0)**	**(1,0)**
Invested capital excluding goodwill and similar intangibles	**45,8**	**43,5**	**41,7**	**40,2**	**38,3**
Goodwill and other similar intangibles	**28,7**	**29,5**	**30,2**	**30,2**	**30,2**
Invested capital including goodwill and similar intangibles	**74,5**	**73,0**	**71,9**	**70,4**	**68,5**
Non-operating assets	**16,8**	**16,8**	**16,8**	**16,8**	**16,8**
Total funds invested	**91,3**	**89,8**	**88,7**	**87,2**	**85,4**

Appendix 18 – Projected BS (sources of financing) in best case scenario

Data in € mln

PROJECTED BALANCE SHEET (SOURCES OF FINANCING)	2015	2016	2017	2018	2019
Net financial position	82,8	79,7	74,4	70,8	64,4
Debt equivalents	2,2	2,2	2,2	2,2	2,2
Net financial position and debt equivalents	85,0	82,0	76,7	73,1	66,7
Minority interests	0,2	0,2	0,2	0,2	0,2
Shareholders' equity	6,1	7,7	11,8	14,0	18,4
Total sources of financing	91,3	89,8	88,7	87,2	85,4

Appendix 19 – Projected IS in best case scenario

Data in € mln

		BEST CASE			
PROJECTED INCOME STATEMENT	**2015**	**2016**	**2017**	**2018**	**2019**
Revenues	**156,7**	**159,3**	**164,1**	**170,1**	**177,8**
Operating cost (personnel and D&A excluded):	(123,0)	(124,2)	(125,6)	(127,6)	(131,6)
Raw materials, consumables, goods and services	(64,3)	(64,9)	(65,6)	(66,7)	(68,8)
Advertising and promotions	(3,8)	(3,8)	(3,9)	(3,9)	(4,1)
Other operating costs	(54,9)	(55,5)	(56,0)	(56,9)	(58,7)
Personnel expenses	(29,1)	(28,7)	(28,6)	(28,2)	(28,5)
EBITDA	**4,6**	**6,4**	**10,0**	**14,3**	**17,8**
Total D&A	(4,8)	(4,7)	(4,7)	(4,9)	(5,0)
Depreciation	(4,4)	(4,3)	(4,3)	(4,4)	(4,6)
Amortization of operating intangibles	(0,4)	(0,4)	(0,4)	(0,4)	(0,4)
EBITA	**(0,3)**	**1,7**	**5,3**	**9,4**	**12,8**
Amortization of assets similar to goodwill	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
EBIT	**(1,9)**	**0,0**	**3,6**	**7,7**	**11,0**
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from equity investments	0,1	0,1	0,1	0,1	0,1
Net financial result:	(5,0)	(5,4)	(5,2)	(5,0)	(4,9)
Exchange rate (losses) gains	(1,0)	(1,0)	(1,0)	(1,0)	(1,0)
Interest (expense) income	(4,0)	(4,4)	(4,2)	(4,0)	(3,9)
EBT	**(6,4)**	**(4,9)**	**(1,1)**	**3,2**	**6,7**
Taxes	2,0	1,5	0,3	(1,1)	(2,1)
Net Income	**(4,4)**	**(3,4)**	**(0,8)**	**2,2**	**4,5**
Minority result	(0,1)	(0,1)	(0,0)	0,0	0,1
Group Net Income	**(4,4)**	**(3,4)**	**(0,8)**	**2,2**	**4,5**

Appendix 20 – FCF calculation in best case scenario

Data in € mln

	BEST CASE				
FREE CASH FLOW CALCULATION	**2015**	**2016**	**2017**	**2018**	**2019**
NOPLAT	**(0,2)**	**1,2**	**3,6**	**6,5**	**8,8**
Amortization of operating intangibles	0,4	0,4	0,4	0,4	0,4
Depreciation	4,4	4,3	4,3	4,4	4,6
Gross cash flow	**4,7**	**5,8**	**8,3**	**11,3**	**13,8**
Change in operating working capital	5,8	2,3	2,1	1,7	2,2
Net capital expenditures	(3,5)	(4,8)	(4,9)	(5,1)	(5,3)
Change in other operating assets and liabilities	0,1	0,0	0,0	0,0	0,0
Gross investment	**2,4**	**(2,4)**	**(2,8)**	**(3,4)**	**(3,1)**
Free cash flow before goodwill and similar intangibles	**7,1**	**3,4**	**5,5**	**7,9**	**10,7**
Investments in goodwill and other intangibles	(4,3)	(2,4)	(2,5)	(1,7)	(1,8)
Free cash flow after goodwill and similar intangibles	**2,7**	**1,0**	**3,1**	**6,2**	**8,9**
Investments in non-operating assets	(8,4)	0,0	0,0	0,0	0,0
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Non-operating taxes	1,9	2,0	2,0	1,9	1,9
Change in debt equivalents	(0,4)	0,0	0,0	0,0	0,0
Non-operating cash flow	**(6,4)**	**2,5**	**2,5**	**2,4**	**2,4**
Cash available to investors	**(3,7)**	**3,5**	**5,5**	**8,6**	**11,3**
Net financial result	(5,0)	(5,4)	(5,2)	(5,0)	(4,9)
Change in minority interests	0,1	0,1	0,0	(0,0)	(0,1)
Change in shareholders' equity	(0,1)	4,9	4,9	(0,0)	0,0
Decrease (increase) in net financial position	**(8,8)**	**3,1**	**5,3**	**3,6**	**6,4**
Beginning net financial position	**74,0**	**82,8**	**79,7**	**74,4**	**70,8**
Ending net financial position	**82,8**	**79,7**	**74,4**	**70,8**	**64,4**

Appendix 21 – NOPLAT calculation in best case scenario

Data in € mln

		BEST CASE			
NOPLAT CALCULATION	**2015**	**2016**	**2017**	**2018**	**2019**
EBITA	**(0,3)**	**1,7**	**5,3**	**9,4**	**12,8**
Operating taxes*	0,1	(0,5)	(1,7)	(3,0)	(4,0)
NOPLAT	**(0,2)**	**1,2**	**3,6**	**6,5**	**8,8**
EBT	(6,4)	(4,9)	(1,1)	3,2	6,7
Income taxes	2,0	1,5	0,3	(1,1)	(2,1)
Actual (blended global) tax rate	**30,8%**	**30,3%**	**27,2%**	**32,5%**	**31,9%**
Adjustments:					
Amortization of assets similar to goodwill	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
Estimated tax rate	31,4%	31,4%	31,4%	31,4%	31,4%
Taxes	0,5	0,5	0,5	0,5	0,5
Impairment losses	0,4	0,4	0,4	0,4	0,4
Estimated tax rate	0,0%	0,0%	0,0%	0,0%	0,0%
Taxes	0,0	0,0	0,0	0,0	0,0
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Estimated tax rate	31,4%	31,4%	31,4%	31,4%	31,4%
Taxes	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Estimated tax rate	0,0%	0,0%	0,0%	0,0%	0,0%
Taxes	0,0	0,0	0,0	0,0	0,0
Net financial result	(5,0)	(5,4)	(5,2)	(5,0)	(4,9)
Estimated tax rate	27,5%	27,5%	27,5%	27,5%	27,5%
Taxes	1,4	1,5	1,4	1,4	1,3
Estimated taxes on EBITA	0,1	(0,5)	(1,7)	(3,0)	(4,0)
EBITA	(0,3)	1,7	5,3	9,4	12,8
Estimated tax rate on EBITA	**31,4%**	**31,4%**	**31,4%**	**31,4%**	**31,4%**
Taxes on EBITA	0,1	(0,5)	(1,7)	(3,0)	(4,0)
Adjustments on taxes	1,9	2,0	2,0	1,9	1,9
Taxes on EBT	2,0	1,5	0,3	(1,1)	(2,1)

Appendix 22 – Reconciliation of NOPLAT with Net Profit in best case scenario

Data in € mln					
BEST CASE					
Reconciliation of NOPLAT with Net Profit	**2015**	**2016**	**2017**	**2018**	**2019**
NOPLAT	**(0,2)**	**1,2**	**3,6**	**6,5**	**8,8**
Amortization of goodwill and other similar intangibles	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Net financial result	(5,0)	(5,4)	(5,2)	(5,0)	(4,9)
Non-operating taxes	1,9	2,0	2,0	1,9	1,9
Minority result	0,1	0,1	0,0	(0,0)	(0,1)
Group Net Income	**(4,4)**	**(3,4)**	**(0,8)**	**2,2**	**4,5**

Appendix 23 – Projected BS (invested capital) in worst case scenario

Data in € mln

<table>
<tr><td colspan="6"><i>WORST CASE</i></td></tr>
<tr><th>PROJECTED BALANCE SHEET (INVESTED CAPITAL)</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th></tr>
<tr><td>Working cash*</td><td>3,1</td><td>3,2</td><td>3,2</td><td>3,3</td><td>3,4</td></tr>
<tr><td>Trade receivables</td><td>27,0</td><td>28,2</td><td>28,7</td><td>31,6</td><td>32,4</td></tr>
<tr><td>Inventories</td><td>46,8</td><td>48,6</td><td>50,7</td><td>53,2</td><td>56,1</td></tr>
<tr><td>Trade payable</td><td>(55,3)</td><td>(55,9)</td><td>(56,8)</td><td>(58,1)</td><td>(59,7)</td></tr>
<tr><td>Trade working capital</td><td>21,7</td><td>24,1</td><td>25,8</td><td>30,0</td><td>32,2</td></tr>
<tr><td>Other current assets and liabilities</td><td>2,3</td><td>2,3</td><td>2,3</td><td>2,3</td><td>2,3</td></tr>
<tr><td>Net working capital</td><td>23,9</td><td>26,4</td><td>28,1</td><td>32,3</td><td>34,5</td></tr>
<tr><td>Total operating fixed capital</td><td>22,8</td><td>22,9</td><td>22,2</td><td>21,0</td><td>19,2</td></tr>
<tr><td>Total other non-current operating assets and liabilities</td><td>(1,0)</td><td>(1,0)</td><td>(1,0)</td><td>(1,0)</td><td>(1,0)</td></tr>
<tr><td>Invested capital excluding goodwill and similar intangibles</td><td>45,8</td><td>48,3</td><td>49,3</td><td>52,2</td><td>52,7</td></tr>
<tr><td>Goodwill and other similar intangibles</td><td>28,7</td><td>29,5</td><td>29,8</td><td>29,9</td><td>29,9</td></tr>
<tr><td>Invested capital including goodwill and similar intangibles</td><td>74,5</td><td>77,7</td><td>79,2</td><td>82,2</td><td>82,6</td></tr>
<tr><td>Non-operating assets</td><td>16,8</td><td>16,8</td><td>16,8</td><td>16,8</td><td>16,8</td></tr>
<tr><td>Total funds invested</td><td>91,3</td><td>94,6</td><td>96,0</td><td>99,0</td><td>99,4</td></tr>
</table>

Appendix 24 – Projected BS (sources of financing) in worst case scenario

Data in € mln

PROJECTED BALANCE SHEET (SOURCES OF FINANCING)	2015	2016	2017	2018	2019
WORST CASE					
Net financial position	82,8	85,1	84,5	89,3	90,7
Debt equivalents	2,2	2,2	2,2	2,2	2,2
Net financial position and debt equivalents	85,0	87,4	86,7	91,6	93,0
Minority interests	0,2	0,2	0,2	0,2	0,2
Shareholders' equity	6,1	7,0	9,1	7,2	6,2
Total sources of financing	91,3	94,6	96,0	99,0	99,4

Appendix 25 – Projected IS in worst case scenario

Data in € mln

		WORST CASE			
PROJECTED INCOME STATEMENT	**2015**	**2016**	**2017**	**2018**	**2019**
Revenues	**156,7**	**158,5**	**161,0**	**164,6**	**169,2**
Operating cost (personnel and D&A excluded):	(123,0)	(124,4)	(125,6)	(128,4)	(132,0)
Raw materials, consumables, goods and services	(64,3)	(65,0)	(65,6)	(67,1)	(69,0)
Advertising and promotions	(3,8)	(3,8)	(3,9)	(4,0)	(4,1)
Other operating costs	(54,9)	(55,5)	(56,1)	(57,3)	(58,9)
Personnel expenses	(29,1)	(28,5)	(28,0)	(27,3)	(27,1)
EBITDA	**4,6**	**5,5**	**7,4**	**8,9**	**10,2**
Total D&A	(4,8)	(4,7)	(4,7)	(4,6)	(4,3)
Depreciation	(4,4)	(4,3)	(4,3)	(4,2)	(3,9)
Amortization of operating intangibles	(0,4)	(0,4)	(0,4)	(0,4)	(0,4)
EBITA	**(0,3)**	**0,9**	**2,7**	**4,3**	**5,9**
Amortization of assets similar to goodwill	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
EBIT	**(1,9)**	**(0,8)**	**1,0**	**2,6**	**4,1**
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from equity investments	0,1	0,1	0,1	0,1	0,1
Net financial result:	(5,0)	(5,6)	(5,6)	(5,7)	(5,9)
Exchange rate (losses) gains	(1,0)	(1,0)	(1,0)	(1,0)	(1,0)
Interest (expense) income	(4,0)	(4,6)	(4,6)	(4,7)	(4,9)
EBT	**(6,4)**	**(5,9)**	**(4,1)**	**(2,6)**	**(1,3)**
Taxes	2,0	1,8	1,2	0,8	0,3
Net Income	**(4,4)**	**(4,1)**	**(2,9)**	**(1,9)**	**(0,9)**
Minority result	(0,1)	(0,1)	(0,0)	(0,0)	(0,0)
Group Net Income	**(4,4)**	**(4,0)**	**(2,8)**	**(1,8)**	**(0,9)**

Appendix 26 – FCF calculation in worst case scenario

Data in € mln

	WORST CASE				
FREE CASH FLOW CALCULATION	**2015**	**2016**	**2017**	**2018**	**2019**
NOPLAT	**(0,2)**	**0,6**	**1,9**	**3,0**	**4,0**
Amortization of operating intangibles	0,4	0,4	0,4	0,4	0,4
Depreciation	4,4	4,3	4,3	4,2	3,9
Gross cash flow	**4,7**	**5,3**	**6,6**	**7,5**	**8,3**
Change in operating working capital	5,8	(2,4)	(1,7)	(4,2)	(2,2)
Net capital expenditures	(3,5)	(4,8)	(4,0)	(3,3)	(2,5)
Change in other operating assets and liabilities	0,1	0,0	0,0	0,0	0,0
Gross investment	**2,4**	**(7,2)**	**(5,7)**	**(7,5)**	**(4,8)**
Free cash flow before goodwill and similar intangibles	**7,1**	**(1,9)**	**0,8**	**0,1**	**3,5**
Investments in goodwill and other intangibles	(4,3)	(2,4)	(2,1)	(1,8)	(1,7)
Free cash flow after goodwill and similar intangibles	**2,7**	**(4,3)**	**(1,3)**	**(1,8)**	**1,9**
Investments in non-operating assets	(8,4)	0,0	0,0	0,0	0,0
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Non-operating taxes	1,9	2,1	2,1	2,1	2,2
Change in debt equivalents	(0,4)	0,0	0,0	0,0	0,0
Non-operating cash flow	**(6,4)**	**2,6**	**2,6**	**2,6**	**2,7**
Cash available to investors	**(3,7)**	**(1,7)**	**1,3**	**0,9**	**4,5**
Net financial result	(5,0)	(5,6)	(5,6)	(5,7)	(5,9)
Change in minority interests	0,1	0,1	0,0	0,0	0,0
Change in shareholders' equity	(0,1)	4,9	4,9	(0,0)	(0,0)
Decrease (increase) in net financial position	**(8,8)**	**(2,3)**	**0,7**	**(4,9)**	**(1,4)**
Beginning net financial position	**74,0**	**82,8**	**85,1**	**84,5**	**89,3**
Ending net financial position	**82,8**	**85,1**	**84,5**	**89,3**	**90,7**

Appendix 27 – NOPLAT calculation in worst case scenario

Data in € mln

	WORST CASE				
NOPLAT CALCULATION	**2015**	**2016**	**2017**	**2018**	**2019**
EBITA	**(0,3)**	**0,9**	**2,7**	**4,3**	**5,9**
Operating taxes*	0,1	(0,3)	(0,9)	(1,4)	(1,8)
NOPLAT	**(0,2)**	**0,6**	**1,9**	**3,0**	**4,0**
EBT	(6,4)	(5,9)	(4,1)	(2,6)	(1,3)
Income taxes	2,0	1,8	1,2	0,8	0,3
Actual (blended global) tax rate	**30,8%**	**30,4%**	**29,9%**	**28,9%**	**25,7%**
Adjustments:					
Amortization of assets similar to goodwill	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
Estimated tax rate	31,4%	31,4%	31,4%	31,4%	31,4%
Taxes	0,5	0,5	0,5	0,5	0,5
Impairment losses	0,4	0,4	0,4	0,4	0,4
Estimated tax rate	0,0%	0,0%	0,0%	0,0%	0,0%
Taxes	0,0	0,0	0,0	0,0	0,0
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Estimated tax rate	31,4%	31,4%	31,4%	31,4%	31,4%
Taxes	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Estimated tax rate	0,0%	0,0%	0,0%	0,0%	0,0%
Taxes	0,0	0,0	0,0	0,0	0,0
Net financial result	(5,0)	(5,6)	(5,6)	(5,7)	(5,9)
Estimated tax rate	27,5%	27,5%	27,5%	27,5%	27,5%
Taxes	1,4	1,5	1,5	1,6	1,6
Estimated taxes on EBITA	0,1	(0,3)	(0,9)	(1,4)	(1,8)
EBITA	(0,3)	0,9	2,7	4,3	5,9
Estimated tax rate on EBITA	**31,4%**	**31,4%**	**31,4%**	**31,4%**	**31,4%**
Taxes on EBITA	0,1	(0,3)	(0,9)	(1,4)	(1,8)
Adjustments on taxes	1,9	2,1	2,1	2,1	2,2
Taxes on EBT	2,0	1,8	1,2	0,8	0,3

Appendix 28 – Reconciliation of NOPLAT with Net Profit in worst case scenario

Data in € mln

Reconciliation of NOPLAT with Net Profit	2015	2016	2017	2018	2019
	WORST CASE				
NOPLAT	**(0,2)**	**0,6**	**1,9**	**3,0**	**4,0**
Amortization of goodwill and other similar intangibles	(1,6)	(1,7)	(1,7)	(1,7)	(1,7)
Impairment losses	0,4	0,4	0,4	0,4	0,4
Non-recurring and extraordinary items	0,0	0,0	0,0	0,0	0,0
Interest income (expense) from investments	0,1	0,1	0,1	0,1	0,1
Net financial result	(5,0)	(5,6)	(5,6)	(5,7)	(5,9)
Non-operating taxes	1,9	2,1	2,1	2,1	2,2
Minority result	0,1	0,1	0,0	0,0	0,0
Group Net Income	**(4,4)**	**(4,0)**	**(2,8)**	**(1,8)**	**(0,9)**

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