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Distressed Firm Valuation: A Scenario Discounted Cash Flow Approach

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Abstract: Valuation of a distressed company is a very tricky issue, for which many approaches and methods have been provided by the literature. Unfortunately, many of the more suitable proposals from a theoretical point of view (i.e., those based on option pricing theory, and even integrated with game theory) are very difficult to apply to real cases. To face the many contingencies emerging in a real case valuation, a *scenario discounted cash flow* (SDCF) model is provided here. The focus is on companies at an advanced stage of distress, where their ability to operate as a going concern is in question, and maintenance or recovery of business continuity requires significant interventions in the firm's strategic, operational, and financial structure. In this context, SDCF, with a number of arrangements elaborated here, appears useful for valuing assets, debt, and equity – from current or potential new investors – and the interactions between them, which are particularly critical for distressed companies. At the same time, SDCF takes into account the firm's liquidation option, not only at the valuation date but even after a restructuring plan has been launched. The going-concern value including the liquidation option should be the reference point for judging the suitability of business continuity compared to liquidation. In presenting the model, the key concepts and methodology adopted are set out following a numerical example inspired by a real case.

Keywords: asset valuation, debt valuation, distressed firm valuation, equity valuation, business restructuring

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1 Distressed Firms: Qualification and Valuation Premises

As is widely known and discussed in the literature, business crisis can be studied according to at least two dimensions, which are linked to each other[1]:

a) *Economic distress*, characterized by a decline in a firm's operating performance as result of strategic problems such as industry dynamics and the firm's competitive positioning and/or operational inefficiencies in the firm's processes and business model, possibly exacerbated by organizational, governance, and ownership issues.

b) *Financial distress*, qualified by a situation of accumulated excess debt with respect to the company's actual and expected operating performance (i.e., income and cash flow) with the consequent position of high risk of outstanding debt and difficulty in accessing new debt.

The second dimension, in particular, can have different levels of severity, which generally imply specific approaches and methods of intervention. In a schematic and simplified way, we can distinguish between:

- A condition of limited difficulty where the firm does not have problems servicing its debt (i.e., paying interest and repayments) in the short term, but the level of debt exceeds the limits set by existing loan agreements (covenant breach). This case raises the issues of renegotiating these covenants and of designing operational and financial interventions aimed at reducing debt and/or increasing operating performance, in addition to any asset disposals and/or recapitalization.
- A situation in which, in addition to the above condition, critical issues in servicing short-term debt emerge, but medium- to long-term prospects are still positive. In this case, in addition to the operational and financial measures mentioned above, the maturity and structure of the debt must be renegotiated.
- A state in which the firm does not appear to be able to meet the cash flows required by outstanding debt without extraordinary interventions to the strategic-operational profile and/or the financial structure.

1 The literature on the nature, causes, dynamics, and ways to overcome a firm's crisis is vast and of various origins (for a summary, see Altman, Hotchkiss, and Wang 2019). Damodaran (2009, Table 2), among others, summarizes the subject of economic decline, classifying it as "reversible" and "irreversible," and financial distress – "limited" or "high" – in a matrix that enables some typical situations to be qualified, which is useful for operational purposes, even though the key issue of whether operational decline is reversible or not is not easy to assess and share.

In these contexts, the issue of capital valuation is relevant for many decisions, including:

- The judgement on whether to continue to operate as a going concern or to liquidate the business.
- The choice between different restructuring plans (whether or not they involve a change of control).
- The negotiation and sharing of the restructuring plan among the different actors involved, including management, directors, shareholders, and creditors (for all of these, distinguishing between current and potential new ones).

The critical issues regarding valuation in these cases are well known. However, to name a few, these are:

- The difficulty of estimating going-concern value, anchored to future strategic and operational prospects that are extremely uncertain.
- Uncertainties that also affect the estimation of liquidation value.
- The need to break down value for different categories of creditors and shareholders, considering that some of them, in particular new finance providers, may play an essential role in safeguarding the firm as a going concern and supporting its relaunch.

These and other characteristics of distressed firms sometimes bring to the fore, in the literature and in business practice, the need to use approaches and valuation tools unlike those used traditionally.[2] In my experience, I have become convinced that it is not a question of introducing different principles and approaches but rather adjusting traditional methods in order to make their application consistent with the distressed firm's valuation. To develop the subject matter, the main methods applicable and my proposal are provided below.

2 Distressed Firm Valuation: Applicable Methodologies

In distressed firms, as in all other situations, the value of capital can take on various configurations, starting from a distinction between going-concern and liquidation value. The latter emerges with particular relevance in presence of

2 Some specific contributions on distressed firm valuation are those by Gilson, Ruback, and Hotchkiss (2000), Crystal and Mokal (2006), and Damodaran (2009).

declining and negative operating performance that persists over time, where continuing as a going concern may no longer be expedient.

Focusing on going-concern value and starting with *cost* (or *asset*) *methods*, it is well known that these are, in general, applicable only to a limited extent to firm valuations owing to some theoretical and practical difficulties. In distressed companies, the underlying logic of such methods (i.e., estimating value of purchasing and reconstructing or replacing company assets) could make sense, especially if we refer to control value, where potential buyers are mainly interested in accessing company assets in order to combine them with those they have available. The most critical problem, however, is the fact that the cost of specific assets (i.e., intangible assets such as brands and know-how), which are at the basis of the value creation process (however potential it may be in a distressed firm), is not only difficult to quantify but also tends to be far from the value linked to these assets, depending on the results that could be achieved through their use in combination with other assets and business elements. This is true both for stand-alone value and control value (with possible synergies of various kinds and weights). However, in particular circumstances[3], asset cost value may constitute an initial valuation reference, which must always be used in conjunction with other market and/or income methods.

Market valuation methods also entail a number of critical issues. First is the limited availability of market parameters, given the difficulty of identifying companies (that are listed or the subject of capital transactions) that are comparable with the distressed firm under valuation. Moreover, even when comparables are available, the presence of losses or only slightly positive earnings (even at the EBITDA level) requires the use of gross results (margin, sales) and/or operating drivers, which are less reliable in reflecting the firm's earnings potential, on which value depends. Despite these and other limitations, market multiples processing is still useful and necessary to test or supplement valuation arising from other methods (primarily DCF).

Faced with the theoretical and operational difficulties of cost- and market-oriented methods, the solution that seems best suited to distressed firms (and to almost all companies) is to base valuation on expected results and, therefore, to resort to *income approach methods*. There are at least three main forms of such

3 Consider start-ups where the costs can be estimated and can approximate the value that the market could assign to the firm's assets (while awaiting future results that are, as ever, uncertain). Consider also mature firms, operating with a simplified business model (e.g., firms not unlike B2B), with critical assets concentrated in tangible assets (i.e., buildings and production plants and logistics).

methods: DCF, methods based on value creation, and methods derived from the theory of financial options.

DCF and methods based on value creation[4], if correctly applied, lead to the same result except for a different breakdown of the value components, where the latter could be useful in linking free cash flow and capital value dynamics to accounting values. Thus, this elaboration is particularly useful for designing and implementing a performance management system.

On the other hand, option-based methods enable the valuation horizon to be broadened compared to DCF projections, which are applied on a deterministic basis, and they appear particularly interesting for valuing different positions of creditors and shareholders, given a certain dynamic in asset value and its underlying cash flow and/or earnings.[5] However, many difficulties arise in using these approaches, based on stochastic (standardized) processes, to reflect the earnings and cash flow dynamics of a specific firm. One of the possible versions is based on discrete stochastic processes (binomial), which appear more flexible.[6] Even in binomial applications, however, forecasted results must nonetheless be summarized in a few generally constant parameters with a consequent difficulty in dealing with negative results (income and cash) and reflecting scenarios that could change over time according to asymmetric dynamics (positive and negative). In addition, the use of complicated modelling (which still excessively simplifies business dynamics) "obscures" the interpretation of valuation results and does not facilitate their sharing and acceptance among the various parties involved in a real corporate restructuring process.

Starting from this framework, my proposal is to value distressed firms using the traditional DCF model but applied with a probabilistic approach. As with option-based models, this allows the reflection of forecasted cash flow dynamics, the estimation of assets, and debt and equity values in relationships with each other. It should be noted that more general models, such as those based on options theory integrated with game theory, aim to qualify situations of partial equilibrium and "optimal" values, while DCF via simulations does not allow for this. In other words, starting from certain assumptions and projections, capital in its components is estimated without taking those values as "optimal." The search for solutions, especially with regard to allocating value among creditors and shareholders, both current and potential, is therefore left to negotiation between the parties,

4 Where the concept of value creation refers to the differential between income and cost of capital for the period (variously qualified as economic value added, economic profit, residual income, and excess earnings), which represents, in reality, only one of the elements of the value generation process, understood as a change in the economic value of capital over time.

5 The many contributions in this vein, of a purely theoretical nature, include Merton (1974), Leland (1994), Leland and Toft (1996), Broadie, Chernov, and Sundaresan (2007).

6 Broadie and Kaya (2007).

while offering information on values resulting from their decisions and thus promoting choice between different restructuring alternatives, including liquidation.

Simulations in DCF can be developed according to at least two approaches: scenario and Monte Carlo methods. They can be used together on the basis of the same underlying assumptions about value drivers' dynamics. The first one is illustrated below for the sake of clarity and because it represents the basic framework needed to structure a Monte Carlo-type simulation model.

3 SDCF Application in a Distressed Firm

The application steps of the SDCF model are retraced by taking as a base reference the case of an insolvent firm with a strategic-operational and financial restructuring plan (RP) under negotiation. It is assumed, therefore, that the firm is a going concern, but its continuity is under threat and may be preserved only after the approval and subsequent implementation of RP. In the meantime, the firm is also assumed to have obtained new debtor-in-possession financing (bridge financing) before RP is approved, where necessary, under court protection.

RP can be proposed by current controlling shareholders and/or by new investors (whether or not in agreement with existing investors), generating two alternative going-concern values – stand alone and with change of control – which could be put in competition with each other. Before deciding which RP could be accepted, the going-concern market value of capital should be given by the average values connected to the different RPs, with or without change of control, weighted by the relative probability of occurrence.[7] For simplicity, a single RP is used below.

RP is generally based on a series of decisions and actions guided by a turnaround strategy that is, evidently, the central and essential kernel of the entire restructuring process. These operating interventions are typically associated with decisions on financial structure. RP takes shape, whether or not under court protection, in different forms that are connected to the firm's situation and to the relevant normative-institutional context.[8]

7 Summary market value should be given by going-concern value supplemented by liquidation value weighting for their respective probabilities of occurrence.

8 For example, different forms of support and protection are envisaged by Italian legislation, from certification of the RP, arrangements with creditors, and agreements enabling continuation as a going concern, similar to U.S. Chapter 11, often referred to in international literature. Whether or not there is a procedure obviously has substantial effects on RP structure and, therefore, on valuation and can be calculated by making specific adjustments to the model outlined here. For a summary of procedures for managing distress in the Italian context, in light of the current reform of the bankruptcy code, see Riva et al. (2018).

Against the background of these elements, for which the many operational aspects are assumed to be known, to organise and make the work easier, the model application steps are as follows:

1. Review of past and current results and balance sheet recognition at the valuation date (including outstanding debt commitments).
2. RP analysis and performance projections under different scenarios.
3. Identification of the financial manoeuvre for existing and new debt and equity.
4. Financial projections, broken down by scenario and qualification of expected values.
5. Estimation of going-concern value of operating assets (enterprise value, "EV").
6. Identification of liquidation value (LV) of assets and of EV in the presence of the option to liquidate the business after the start of RP (EV_L).
7. Valuation of debt and equity at different classes and levels.
8. Valuation summary and sensitivity analysis.

4 Past Performance and Initial Balance Sheet

The first step in valuation is to analyse the firm's past results and to recognize its initial balance sheet.

I will not dwell on the analysis of results achieved, although underlining their extreme relevance as a basis for projections will be further explored in both summary and granular terms.[9] Given that a tendency towards inertia and resistance to change are typical characteristics of organizations and firms, a critical analysis of past and current dynamics is useful in order to judge the potential and risks of projections in RP.

As far as the initial balance sheet is concerned, distressed firms can have a history of accounting records that might be not completely transparent and reliable, which, together with changes in valuation perspective on certain balance sheet items, could require some adjustment to initial book capital. Among other things, a key issue is the identification of overdue operating liabilities to be restructured, together with provisions for risks and charges to be increased or activated. In the event of insolvency proceedings, all debt, including operating liabilities, outstanding at the start of such proceedings must be treated as "to be restructured."

Moving on to introduce our example (obviously considerably simplified compared to the complications of reality), Table 1 shows the initial restated

9 Reference is made to the analyses by product line, market segments, geographical area, facility, and so on. It is essential to explore past dynamics and to judge future projections in granular terms in order to appreciate their characteristics, risk level, and critical issues.

Table 1: FASHION Co.: Restated financial statements at book value.

€ million	−1	0
Sales	135	120
EBITDA	5.0	0.0
Depreciation	−5.0	−5.0
EBIT	0.0	−5.0
Interest expenses (IE)	−3.5	−3.5
EBT	−3.5	−8.5
Taxes	−0.5	−0.5
Net income	−4.0	−9.0
Working capital		30.0
Fixed assets		40.0
Invested capital		70.0
Cash		−4.0
Financial debt[a]		75.0
Debtor-in-possession financing		5.0
Net financial position (NFP)		76.0
Equity		−6.0

[a]Overdue operating liabilities included.

financial statements at book values and the cash flow needs for servicing the outstanding debt (Table 2).[10]

In this structure, overdue operating liabilities (or debt to be restructured) are included in financial debt, divided, for simplicity, into two levels, senior and junior.[11] Debtor-in-possession financing (or DIP), referring to cash made available to support the firm's continuity in the RP preparation phase, is shown separately.

With regard to fixed assets, apart from impairment issues (connected with capital valuation under discussion), the presence of any surplus assets could be significant. Such surplus assets are not considered in the example, but they can be easily treated in EV and cash flow projections.

5 Restructuring Plan and Operating Cash Flow Projections

The central point of DCF is the estimation of cash flows from operations (FCF). Beyond the analytical apparatus used (via scenario or Monte Carlo simulation),

10 In the Excel model from which the tables are obtained values are not rounded.

11 In practice, as is well known, such debt levels can be multiple. A real-world valuation process is more complicated than the one illustrated below but does not change in its structure.

Table 2: FASHION Co.: Financial debt.

€ million	Nominal value	Cost (rate)	Repayments scheduling and interest expenses					
			1	2	3	4	5	Total
Senior debt	40.0		20.0	5.0	0.0	0.0	0.0	
Repayments			20.0	15.0	5.0	0.0	0.0	40.0
Cash IE		3.5%	1.4	0.7	0.2	0.0	0.0	2.3
Non-cash IE		0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Junior debt	35.0		36.4	37.9	39.4	25.9	0.0	
Repayments			0.0	0.0	0.0	15.0	27.0	42.0
Cash IE		2.0%	0.7	0.7	0.8	0.8	0.5	3.5
Non-cash IE		4.0%	1.4	1.5	1.5	1.6	1.0	7.0
Cash flow (CF) due to existing debt			22.1	16.4	5.9	15.8	27.5	87.7

FCFs are based on the firm's situation and its strategic and operational prospects. To examine these elements in depth, it is essential to understand the following:

- The structure and dynamics of the firm's competitive space and identification of the main trends and challenges to be faced.
- The potential still existing in the albeit distressed (and even declining) firm in terms of distinctive resources and skills (competence), activities, and operational processes, as well as the value chain's downstream and upstream links.
- The business strategy underlying RP, outlining the points of change and, if relevant, also the persistence elements with respect to the past and the company's ability to tackle the challenges of the competitive environment, leveraging the firm's strengths and, at the same time, limiting the negative impact of its weaknesses.
- Interventions on the business model (processes and relationships) emerging from RP, consistent with the renewed business strategy, highlighting the action plans and the key value drivers aimed at improving the firm's performance with reference targets (milestones) set throughout RP implementation.

These essential components of RP must then be translated into financial projections, which, as well as being instrumental in the definition and sharing of the financial manoeuvre, are essential inputs for capital valuation.

Although these projections are supported and assessed by various parties, including those with divergent interests (including management, advisors, attestor, and new investors), they are nevertheless subject to a high degree of uncertainty, which must be reflected in the valuation process. This is true in any company situation, but it is particularly important in distressed firms, where RP

Table 3: FASHION Co.: Business plan: value drivers' summary.

		1	2	3	4	5
Sales annual growth	Expected	0.8%	1.5%	2.3%	2.4%	2.6%
	Base	3.0%	4.0%	5.0%	5.0%	5.0%
	Best	5.0%	6.0%	7.0%	7.0%	7.0%
	Worst	−3.0%	−3.0%	−3.0%	−3.0%	−3.0%
EBITDA margin	Expected	0.8%	2.6%	5.1%	6.9%	8.5%
	Base	3.0%	5.0%	8.0%	10.0%	12.0%
	Best	5.0%	7.0%	10.0%	12.0%	14.0%
	Worst	−3.0%	−2.0%	−1.0%	0.0%	0.0%
Working capital on sales	Expected	26.9%	26.2%	25.4%	24.6%	23.8%
	Base	25.0%	24.0%	23.0%	22.0%	21.0%
	Best	25.0%	24.0%	23.0%	22.0%	21.0%
	Worst	30.0%	30.0%	30.0%	30.0%	30.0%
CAPEX on sales		5.0%	4.0%	3.0%	3.0%	3.0%
Depreciation (years)		8.0	8.0	8.0	8.0	8.0
Scenario probability	Base	51.0%				
	Best	9.0%				
	Worst	40.0%				

foresees projects and actions for change (at times radical), which may be achieved only in part and may also prove unsuitable for improving business performance, as initially forecasted to do.

In this context, the scenario approach considers taking the best available projection as a starting point ("base" or "most likely") in order to derive a series of possible evolutionary alternatives, which underlie different hypotheses about the critical factors mentioned above (i.e., the dynamics of the competitive environment, business strategy, and business model) or similar. The example in Table 3, simplified for presentation purposes, identifies three scenarios, the value drivers of which are summarized over a five-year time horizon.[12]

The base scenario reflects the plan proposed by the firm (under the guidance of the management as an expression of current or new shareholders) to maintain or recover business continuity and it is subject to verification, negotiation, and approval by the various parties involved. The values expressed in this scenario are therefore referred to below as "forecasted" values or "forecast."

The best-case scenario expresses the highest results that could be achieved if RP proves to be more successful than expected (although still within the scope of realistic and possible assumptions). It appears relevant, both for its impact on

12 For an extended application of scenario analysis to the key drivers of company performance aim at estimating the share price target, see Srinivasan and Lane (2011).

value and because the distance between best and base results is an indicator (among others) of RP's risk. All other things being equal, RP is riskier the closer the forecasted values are to the best ones (as is typical in my experience).

Worst-case scenario aims to reflect what could happen if the planned actions are not adequate—for many reasons, whether internal or external, controllable or uncontrollable by management—and the firm continues along the current path of decline, or improvements are significantly lower than forecasted. For this scenario, too, in addition to the effects on value examined below, the distance from forecast (here often significant) is an indicator of RP's risk profile.

The three scenarios proposed here are the minimal ones to operate with a probabilistic approach. They can be broken down into other intermediates, but, above all, are enriched by a Monte Carlo simulation. In the latter case, a probability distribution and an indicator of correlation with the other drivers are associated with each of the value drivers.[13] The potential of historical company data and analyses and projections available for industry and for comparable firms will be exploited in simulations where possible.

In scenario analysis, unlike in Monte Carlo simulations, probability is not attributed to single drivers (according to a continuous function) but rather to each scenario. This is a very delicate step because of its impact on value and is not easy to tackle without referring to subjective judgement, which will probably vary among the various actors involved in the valuation process. An initial reference could be that of rating analyses and the probability of survival associated with the different rating classes. In the example, the probability of RP's failure is assumed to be slightly lower than that of default in five years for firms with a CCC-C rating (Table 4).

Starting from these and/or other references, such as those relating to cases of success/failure of continuity plans in a particular context, different (subjective) probability estimates could be introduced on the basis of specific elements deemed relevant. On the other hand, even when adopting a Monte Carlo approach, it is essential to analyse the distribution of final values in light of summary elements of judgment (such as those cited) because a construction based on the aggregation of numerous analytical projections could lead to a sum of "errors" and unreasonable final summary values.

Given the scenarios (or simulation) on the value drivers, it is possible to proceed with financial projection in the first phase, up to net operating profit after taxes (NOPAT), free cash flow (FCF), and net invested capital. For concise

13 For an introduction to the application of Monte Carlo approach to company valuation, see Vincenzi (2016).

Table 4: Average cumulative default rate in Europe (1981–2018).

Rating class	Time horizon (years)			
	1	3	5	7
BB	0.4%	1.9%	3.7%	5.5%
B	2.1%	8.3%	12.4%	14.5%
CCC/C	25.5%	37.9%	43.4%	44.2%

Source: S&P (2019), table 25, p. 59.

presentation, operating financial projections are developed here in conjunction with those related to the financial manoeuvre.[14]

6 The Financial Manoeuvre

The plan supporting the firm's continuation as a going concern generally entails numerous interventions in the financial structure, subject to negotiations with various current and potential investors, who will judge the proposals on the basis of the value of the financial instruments they hold or could activate. In this way, an iterative process emerges, where the business restructuring plan, operating financial projections, interventions on financial structure, and asset, debt, and equity values intersect until they reach (or not) a "balance" (as accepted by the market).

The financial manoeuvre is clearly influenced by the specific rules (e.g., the preferential rights on cash flow for the different categories of debtholders in the liquidation scenario) that depend both on the local law and on the specific provisions of the corporate restructuring operation. One of the main advantages of the SDCF is that it provides a framework based on general principles and methods that can be easily adapted to reflect the specific characteristics of the company under observation, given the local jurisdiction.

By way of example (see Table 5), a financial manoeuvre is presented that contemplates the following:

– The use of additional new debtor-in-possession financing (DIP) to service RP's implementation, in addition to that already collected, to maintain business continuity during RP's preparation and negotiation.

14 It's clear that the need to restructure the current debt should emerge from the comparison between the cash flow due to existing debt (Table 2) and the cash flow for debt service (CFD) projected in the business plan (here reported in the following Table 7).

- The restructuring of the initial financial debt by providing for nominal value reductions (write-offs) differentiated according to the level of seniority, which is maintained, and by granting creditors rights over equity (equity swaps) to partially offset the write-off.
- A capital increase by cash injection, with the definition of a structure for the free cash flow to equity (FCFE) distribution at the end of RP, differentiating between categories of shareholders (equity waterfall) (see Table 6).[15]

Inputs include financial restructuring costs and a forecasted financial borrowing capacity expected at the end of RP[16] (which can also be used to repay the initial debt).

7 Financial Projections

Given RP, including the business plan and financial manoeuvre, financial accounting values are forecast, broken down by scenario (see Table 7).

Expected values are a summary of the projected values under the various scenarios, weighted by their probability of realization. In the example, as in many practical situations, expected values are lower than those forecasted (base scenario) due to the asymmetrical distribution of values between the best- and the worst-case scenarios. This is a key step, particularly significant for distressed companies, where, as previously observed, the distance between the values of different scenarios can be considerable, with an "optimistic" base projection being much closer to the best than the worst scenario. This might not happen in some situations: scenario approach is mainly aimed at making risk profile transparent and supporting RP's feasibility assessment and company valuation.

15 In the example, there is no room for initial equity whose value is estimated at null (without prejudice to the possibility of existing shareholders participating in the capital increase). If the initial equity value is positive, which is sometimes possible even if debt is written off, it will be included in the financial manoeuvre and in the waterfall according to the lines described here for the other equity components. An alternative financial manoeuvre, involving acquisition of control via debt purchase, is illustrated in Moyer, Martin, and Martin (2012). In this case, existing debt should be purchased (in whole or in part) at the price traded on the market, which can also be assessed in light of the market value of debt, output of this or other valuation models.

16 In the example, debt capacity is, in a simplified way, related to EBITDA. Another possibility is to link sustainable debt to FCF via debt service coverage ratio (DSCR), given by FCF divided by cash flow to debt (CFD). A DSCF target value could be set at the end of RP, to be multiplied by FCF to estimate CFD. From CFD, the debt's target value could be projected, assuming its average cost and duration.

Table 5: FASHION Co.: Financial restructuring plan.

€ million	Pre-restr (nominal value)	Change	Post-restr (nominal value)	Rate	Years						New equity (nominal value)
					0	1	2	3	4	5	
Debtor-in-possession financing (DIP)	5.0	5.0	10.0		10.0	10.6	11.2	11.9	7.6	0.0	0.0
Repayments						0.0	0.0	0.0	5.0	8.1	
Cash IE				2.0%		0.2	0.2	0.2	0.2	0.2	
Non-cash IE				6.0%		0.6	0.6	0.7	0.7	0.5	
Senior debt (SD)	40.0	–30%	28.0		28.0	28.0	28.0	28.0	28.0	0.0	12.0
Repayments						0.0	0.0	0.0	0.0	28.0	
Cash IE				3.0%		0.8	0.8	0.8	0.8	0.8	
Non-cash IE				0.0%		0.0	0.0	0.0	0.0	0.0	
Junior debt (JD)	35.0	–60%	14.0		14.0	14.4	14.9	15.3	15.8	0.0	21.0
Repayments						0.0	0.0	0.0	0.0	16.2	
Cash IE				0.0%		0.0	0.0	0.0	0.0	0.0	
Non-cash IE				3.0%		0.4	0.4	0.4	0.5	0.5	
Total IE						2.1	2.1	2.2	2.3	1.9	
New (cash) equity		15.0	15.0		15.0						15.0
Restructuring costs						5.0					
Debt on EBITDA target at the end of the plan										2.0x	
Return on cash				1.0%							

Table 6: FASHION Co.: Equity waterfall.

€ million	Nominal value	Multiple cash on cash (CoC)	% After CoC	Maximum
Equity from new cash	15	2.0×	50.0%	
Equity from SD write-off	12		20.0%	12
Equity from JD write-off	21		30.0%	21
Total	48		100.0%	

8 The (Going-Concern) Value of Assets

Given the projection of cash flows, the going-concern value of operating activities (EV) is estimated as a function of the expected FCF during the plan period and the terminal value (TV), discounted at the cost of capital.

Among the DCF models, adjusted present value (APV) is suggested here, where assets are assumed to be financed by equity, calculating separately the debt tax shield value.[17] This is for simplicity of calculation, since the most typical discounting approach via weighted average cost of capital (WACC) assumes a constant target financial structure, which is difficult to estimate in a distressed firm. Alternatively, actual financial structure could be used; however, it changes over time as the RP progresses, with many technical difficulties to manage it in the valuation model. Given that DCF via APV or WACC, if correctly applied, arrives at the same (asset, debt, and equity) values, the simplest method (APV) is used, checking the results.[18]

The unlevered cost of capital (K_U, see Table 8) is estimated, referring to the simplified CAPM model; alternatively, a multifactorial model can be used. The systematic risk coefficient (beta) should also reflect, among other things, the firm's state of decline, with a value higher than the average (or median) value of comparable, non-declining firms.[19]

17 As has been long proposed by, among others, Arzac (1996).

18 This will be carried out at the level of equity value, estimated via cash flows allocated to it (FCFE), discounted at the cost of capital obtained analytically (based on the evolution of the financial structure and the cost of debt over the plan period), as will be shown below (see Table 19).

19 A reference for estimating the beta for declining firms can be found in Bravo (2019). The author estimates the (unlevered) beta over the firm's life cycle, classifying listed companies in the U.S. within different portfolios according to life cycle. For those in decline, average beta is 1.37 (compared to 0.83 for mature companies, 0.99 for developing firms, and 1.35 for start-ups). The suggested procedure entails starting from unlevered beta (average or median) of comparable, non-declining listed companies and then estimating a decline premium whose measure could be related to the severity of the firm's declining process.

Table 7: FASHION Co.: Financial projections post restructuring.

€ million	Value at 0		Expected					Base					Best					Worst				
	Pre-Restr	Post-Restr	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Working capital	30.0	30.0	32.6	32.2	31.9	31.7	31.4	30.9	30.9	31.0	31.2	31.2	31.5	32.1	32.9	33.6	34.4	34.9	33.9	32.9	31.9	30.9
Fixed assets	40.0	40.0	41.0	40.8	39.5	38.4	37.6	41.2	41.2	40.1	39.3	38.9	41.3	41.5	40.6	40.1	40.0	40.8	40.2	38.5	36.9	35.3
Invested capital	70.0	70.0	73.6	73.0	71.4	70.1	69.0	72.1	72.0	71.1	70.5	70.1	72.8	73.5	73.5	73.7	74.4	75.7	74.1	71.3	68.7	66.3
DIP	5.0	10.0	10.6	11.3	12.1	9.9	5.8	10.6	11.2	11.9	7.6	0.0	10.6	11.2	11.9	7.6	0.0	10.6	11.4	12.4	13.4	14.4
SD	40.0	28.0	28.0	28.3	28.7	29.0	12.6	28.0	28.0	28.0	28.0	0.0	28.0	28.0	28.0	28.0	0.0	28.0	28.8	29.7	30.6	31.5
JD	35.0	14.0	14.4	14.9	15.3	15.8	6.5	14.4	14.9	15.3	15.8	0.0	14.4	14.9	15.3	15.8	0.0	14.4	14.9	15.3	15.8	16.2
Debt to raise							22.3					35.7					45.8					0.0
(Cash)/debt[a]	−4.0	−24.0	−10.5	−8.7	−10.7	−11.5	−7.3	−14.7	−15.2	−20.4	−22.9	−15.5	−16.4	−18.7	−26.3	−31.3	−36.5	−3.9	1.8	5.2	7.5	9.7
NFP	76.0	28.0	42.5	45.8	45.4	43.2	39.9	38.3	38.9	34.8	28.5	20.2	36.6	35.3	28.9	20.1	9.3	49.2	57.0	62.6	67.2	71.8
Equity	−6.0	42.0	31.1	27.2	26.1	26.9	29.1	33.8	33.1	36.3	42.0	49.9	36.2	38.2	44.6	53.6	65.0	26.6	17.1	8.8	1.6	−5.6
Sales	120.0		120.9	122.7	125.5	128.5	131.8	123.6	128.5	135.0	141.7	148.8	126.0	133.6	142.9	152.9	163.6	116.4	112.9	109.5	106.2	103.0
EBITDA	0.0		0.9	3.2	6.4	8.9	11.2	3.6	6.4	10.8	14.2	17.9	6.0	9.3	14.3	18.3	22.9	−3.6	−2.3	−1.1	0.0	0.0
Depreciation	−5.0		−5.0	−5.1	−5.1	−4.9	−4.8	−5.0	−5.1	−5.1	−5.0	−4.9	−5.0	−5.2	−5.2	−5.1	−5.0	−5.0	−5.1	−5.0	−4.8	−4.6
EBITA	−5.0		−4.1	−1.9	1.3	3.9	6.4	−1.4	1.3	5.7	9.2	12.9	1.0	4.2	9.1	13.3	17.9	−8.6	−7.4	−6.1	−4.8	−4.6
IE on DIP			−0.8	−0.8	−0.9	−1.0	−0.8	−0.8	−0.8	−0.9	−1.0	−0.6	−0.8	−0.8	−0.9	−1.0	−0.6	−0.8	−0.8	−0.9	−1.0	−1.1
IE on SD			−0.8	−0.8	−0.9	−0.9	−0.9	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.8	−0.9	−0.9	−0.9
IE on JD			−0.4	−0.4	−0.4	−0.5	−0.5	−0.4	−0.4	−0.4	−0.5	−0.5	−0.4	−0.4	−0.4	−0.5	−0.5	−0.4	−0.4	−0.4	−0.5	−0.5
Total IE			−2.1	−2.1	−2.2	−2.3	−2.1	−2.1	−2.1	−2.2	−2.3	−1.9	−2.1	−2.1	−2.2	−2.3	−1.9	−2.1	−2.1	−2.2	−2.3	−2.5
Interest income			0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.0	0.0	−0.1	−0.1
Restructuring costs			−5.0	0.0	0.0	0.0	0.0	−5.0					−5.0					−5.0				
EBT			−10.9	−3.9	−0.9	1.8	4.3	−8.2	−0.7	3.6	7.1	11.2	−5.8	2.2	7.1	11.3	16.3	−15.4	−9.4	−8.4	−7.2	−7.1
Tax rate			0%	−1%	−29%	53%	50%	0%	0%	10%	20%	30%	0%	10%	10%	20%	30%	0%	0%	0%	0%	0%
Income taxes			0.0	0.0	−0.2	−0.9	−2.2	0.0	0.0	−0.4	−1.4	−3.4	0.0	−0.2	−0.7	−2.3	−4.9	0.0	0.0	0.0	0.0	0.0
Net earnings			−10.9	−4.0	−1.1	0.8	2.2	−8.2	−0.7	3.3	5.7	7.9	−5.8	2.0	6.4	9.0	11.4	−15.4	−9.4	−8.4	−7.2	−7.1
EBITDA			0.9	3.2	6.4	8.9	11.2	3.6	6.4	10.8	14.2	17.9	6.0	9.3	14.3	18.3	22.9	−3.6	−2.3	−1.1	0.0	0.0
Net working capital variation[b]			−2.6	0.4	0.2	0.3	0.3	−0.9	0.0	−0.2	−0.1	−0.1	−1.5	−0.6	−0.8	−0.8	−0.7	−4.9	1.0	1.0	1.0	1.0

Table 7: (continued)

€ million	Value at 0		Expected					Base					Best					Worst				
	Pre-Restr	Post-Restr	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Capex			−6.0	−4.9	−3.8	−3.9	−4.0	−6.2	−5.1	−4.0	−4.3	−4.5	−6.3	−5.3	−4.3	−4.6	−4.9	−5.8	−4.5	−3.3	−3.2	−3.1
Restructuring costs			−5.0					−5.0					−5.0					−5.0				
FCF before taxes			−12.7	−1.3	2.8	5.3	7.5	−8.5	1.3	6.6	9.8	13.3	−6.8	3.5	9.2	13.0	17.3	−19.3	−5.7	−3.4	−2.2	−2.1
Interest income			0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.0	0.0	−0.1	−0.1
New debt							22.3					35.7					45.8					0.0
Income taxes			0.0	0.0	−0.2	−0.9	−2.2	0.0	0.0	−0.4	−1.4	−3.4	0.0	−0.2	−0.7	−2.3	−4.9	0.0	0.0	0.0	0.0	0.0
CF for debt service			−12.4	−1.2	2.7	4.5	27.8	−8.2	1.5	6.3	8.6	45.9	−6.6	3.4	8.7	11.0	58.5	−19.1	−5.7	−3.4	−2.3	−2.2
Cash for debt service			11.6	9.3	11.3	15.2	39.3	15.8	16.2	21.5	29.0	68.8	17.4	19.8	27.4	37.3	89.8	4.9	−1.8	−5.2	−7.5	−9.7
CF to DIP			−0.2	−0.1	−0.1	−3.1	−4.9	−0.2	−0.2	−0.2	−5.2	−8.2	−0.2	−0.2	−0.2	−5.2	−8.2	−0.2	0.0	0.0	0.0	0.0
Cash after CF to DIP			11.4	9.2	11.2	12.0	34.4	15.6	16.0	21.3	23.8	60.6	17.2	19.6	27.2	32.1	81.5	4.7	−1.8	−5.2	−7.5	−9.7
CF to SD			−0.8	−0.5	−0.5	−0.5	−17.3	−0.8	−0.8	−0.8	−0.8	−28.8	−0.8	−0.8	−0.8	−0.8	−28.8	−0.8	0.0	0.0	0.0	0.0
Cash after CF to SD			10.5	8.7	10.7	11.5	17.1	14.7	15.2	20.4	22.9	31.7	16.4	18.7	26.3	31.3	52.7	3.9	−1.8	−5.2	−7.5	−9.7
CF to JD			0.0	0.0	0.0	0.0	−9.7	0.0	0.0	0.0	0.0	−16.2	0.0	0.0	0.0	0.0	−16.2	0.0	0.0	0.0	0.0	0.0
Total CF			−13.5	−1.8	2.0	0.8	−4.2	−9.3	0.4	5.3	2.5	−7.4	−7.6	2.3	7.6	4.9	5.2	−20.1	−5.7	−3.4	−2.3	−2.2
Cash final			10.5	8.7	10.7	11.5	7.3	14.7	15.2	20.4	22.9	15.5	16.4	18.7	26.3	31.3	36.5	3.9	−1.8	−5.2	−7.5	−9.7

[a]Post Restructuring "Cash" (24) originates from: cash on hand before restructuring (4) plus cash from new DIP (5) and cash from new equity (15).[b]In the cash flow statement "+" indicate cash increase, "−" cash decrease.

Table 8: FASHION Co.: Cost of capital.

Risk-free rate (Rf)	2.5%
Market risk premium (MRP)	5.0%
Beta unlevered (β_U)	1.5
Specific risk premium (SRP)	0.0%
Cost of unlevered capital (K_U)	10.0%

A market method (EV/EBITDA multiple) is proposed for TV. Given TV's weight on EV, especially in distressed firms, this approach should facilitate the sharing of value judgments between actors involved in valuation, as well as reflecting, in many cases, the path for realizing the projected value (through restructured company sale) at the end of RP. In any case, a value driver approach could be applied to check the results obtained via multiples.[20]

In light of this approach and these assumptions, EV calculation is illustrated in Table 9.

It is useful to emphasize the treatment of specific risk, linked to the state of economic and financial crisis of the firm. In our example, the specific risk premium (SRP) should be fully reflected in the expected cash flows, which take into account the worst-case scenario projections (values and probability of occurrence). If this perspective is not deemed to fairly reflect the point of view of market investors in distressed firms, a measure of SRP could be considered in the calculation of K_U (Table 8), obviously obtaining, *ceteris paribus*, a lower EV.

20 As is known, TV can be expressed in this way:

$$TV = \frac{NOPAT_{n+1} \times \left(1 - \frac{g}{RONIC}\right)}{(WACC - g)}$$

where NOPAT is the (normalized) operating income (after taxes), g is the (perpetual, constant) growth rate of NOPAT, RONIC expresses the profitability of the new investments underlying g, and WACC is the cost of capital assuming a (target) financial structure. Given the relationship between NOPAT and EBITDA, EV/EBITDA can be linked to value drivers in these terms:

$$\frac{EV}{EBITDA} = \frac{\left(1 - \frac{D\&A}{EBITDA}\right)(1 - T_c) \times \left(1 - \frac{g}{RONIC}\right)}{(WACC - g)}$$

Where D&A is depreciation and amortization and T_c is the tax rate on operating income (EBITDA – D&A).

Table 9: FASHION Co.: Enterprise value (DCF model).

€ million	Expected						Base					
	0	1	2	3	4	5	0	1	2	3	4	5
Sales		120.9	122.7	125.5	128.5	131.8		123.6	128.5	135.0	141.7	148.8
EBITDA		0.9	3.2	6.4	8.9	11.2		3.6	6.4	10.8	14.2	17.9
EBITA		−4.1	−1.9	1.3	3.9	6.4		−1.4	1.3	5.7	9.2	12.9
Operating taxes		0.0	0.0	−0.4	−1.2	−2.5		0.0	0.0	−0.6	−1.8	−3.9
Tax rate		0.0%	−2.0%	29.6%	29.8%	38.7%		0%	0%	10%	20%	30%
NOPAT		−4.1	−2.0	0.9	2.8	3.9		−1.4	1.3	5.1	7.3	9.1
Net working capital variation		−2.6	0.4	0.2	0.3	0.3		−0.9	0.0	−0.2	−0.1	−0.1
Depreciation		5.0	5.1	5.1	4.9	4.8		5.0	5.1	5.1	5.0	4.9
Capex		−6.0	−4.9	−3.8	−3.9	−4.0		−6.2	−5.1	−4.0	−4.3	−4.5
Restructuring costs		−5.0	0.0	0.0	0.0	0.0		−5.0	0.0	0.0	0.0	0.0
Unlevered FCF		−12.7	−1.3	2.5	4.1	5.0		−8.5	1.3	6.0	8.0	9.4
Interest on debt/(cash)		1.8	2.0	2.1	2.2	2.0		1.8	2.0	2.0	2.0	1.7
Tax rate on interest expences		0.0%	0.9%	5.8%	11.2%	15.0%		0.0%	0.0%	10.0%	20.0%	30.0%
Tax shield on debt		0.0	0.0	0.1	0.2	0.3		0	0	0.2	0.4	0.5
FCF with debt tax shield		−12.7	−1.3	2.6	4.4	5.3		−8.5	1.3	6.2	8.4	9.9
EBITDA multiple						7.2×						7.0×
K_U		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%	10.0%	10.0%	10.0%	10.0%
Enterprise value (EV)[a]	45.4	62.6	70.2	74.7	77.8	80.2	87.5	104.8	113.9	119.1	122.7	125.0

Table 9: (continued)

€ million						Best						Worst
	0	1	2	3	4	5	0	1	2	3	4	5
Sales		126.0	133.6	142.9	152.9	163.6		116.4	112.9	109.5	106.2	103.0
EBITDA		6.0	9.3	14.3	18.3	22.9		−3.6	−2.3	−1.1	0.0	0.0
EBITA		1.0	4.2	9.1	13.3	17.9		−8.6	−7.4	−6.1	−4.8	−4.6
Operating taxes		0.0	−0.4	−0.9	−2.7	−5.4		0.0	0.0	0.0	0.0	0.0
Tax rate		0%	10%	10%	20%	30%		0%	0%	0%	0%	0%
NOPAT		1.0	3.8	8.2	10.6	12.5		−8.6	−7.4	−6.1	−4.8	−4.6
Net working capital variation		−1.5	−0.6	−0.8	−0.8	−0.7		−4.9	1.0	1.0	1.0	1.0
Depreciation		5.0	5.2	5.2	5.1	5.0		5.0	5.1	5.0	4.8	4.6
Capex		−6.3	−5.3	−4.3	−4.6	−4.9		−5.8	−4.5	−3.3	−3.2	−3.1
Restructuring costs		−5.0	0.0	0.0	0.0	0.0		−5.0	0.0	0.0	0.0	0.0
Unlevered FCF		−6.8	3.0	8.3	10.3	11.9		−19.3	−5.7	−3.4	−2.2	−2.1
Interest on debt/(cash)		1.8	2.0	2.0	2.0	1.6		1.8	2.1	2.2	2.4	2.5
Tax rate on interest expences		0.0%	10.0%	10.0%	20.0%	30.0%		0.0%	0.0%	0.0%	0.0%	0.0%
Tax shield on debt		0	0.2	0.2	0.4	0.5		0.0	0.0	0.0	0.0	0.0
FCF with debt tax shield		−6.8	3.2	8.5	10.7	12.4		−19.3	−5.7	−3.4	−2.2	−2.1
EBITDA multiple						8.0×						5.0×
K_U		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%	10.0%	10.0%	10.0%	10.0%
Enterprise value (EV)[a]	131.7	151.6	163.6	171.4	177.9	183.3	−27.7	−11.1	−6.5	−3.8	−1.9	0.0

[a]EV at the end of year 5 is given by EBITDA x Multiple, e.g. for BASE case, 125.0 = 17.86 × 7.0. From year 4, $EV_t = (FCF_{t+1} + EV_{t+1})/(1 + K_U)$, e.g., for BASE case, 122.7 = (9.95 + 125.0)/(1 + 0.1).

The question is different if EV is estimated by discounting the forecasted cash flows.[21] In this case, SRP will be introduced in order to tackle (at the level of cost of capital and not cash flows) the asymmetry among values and the probability of occurrence between best- and worst-case scenarios compared to base, which should be the phenomenon underlying the specific risk.[22] An estimate of SRP can be obtained by calculating the cost of capital, which, applied to the forecasted (base case) cash flows, allows the achievement of the same EV estimated on expected cash flows. SRP will therefore be equal to the differential between this figure of cost of capital and that computed via CAPM, as exemplified in Table 10 (also with reference to different EV related to distinct probabilities of the worst-case scenario occurring).

9 Liquidation Value and Premium for Liquidation Option

In distressed firms, liquidation value (LV) is relevant for deciding on continuity, for which it is necessary to compare EV with LV. Many elements of complexity and uncertainty can be faced in estimating LV, relating to the asset liquidation perimeter (individual or group), liquidation process timing and costs, and assets' realizable value, which could also be "discounted" for sale in distress conditions. A simplified valuation procedure is provided here for estimating LV (see Table 11).

The starting point is the initial balance sheet, forecasting the difference between book (going-concern) value and realizable value for various asset categories. The discount should also reflect the timing of liquidation value realization.[23] In some cases, it is also possible to identify valuable assets not recorded in the accounting books that could have a market value in liquidation; these typically include identifiable intangibles such as brands and/or patents and know-how. In the example, the value of these assets (assuming a brand) is estimated as multiple on sales. LV will comprise external (advisory and other) and internal liquidation costs, including operating costs for managing the liquidation process. In the example, these latter costs are computed as a percentage of gross asset value (non-booked asset included).

The comparison between EV and LV must concern not only the total value of the firm's assets but also the value of debt-holders, stratified by seniority classes,

21 This could also be necessary/useful in valuation situations where it is difficult to operate explicitly on the scenarios and therefore on the expected values.

22 In this sense, among many, Koziol (2014).

23 For a general reference to the discount between the operating book value and the liquidation value of the assets, see, among others, S&P Global (2018), Tables 5, 13 and 14, pages 4, 10, 11.

Table 10: FASHION Co.: Enterprise value (DCF model on base case forecasted FCF).

€ million						Base		Sensitivity analysis		
	0	1	2	3	4	5	Default probability	EV	SRP	Adj K_U
EBITDA		3.6	6.4	10.8	14.2	17.9	20%	69.8	4.9%	14.9%
FCF with debt tax shield		−8.5	1.3	6.2	8.4	9.9	25%	63.7	7.0%	17.0%
EBITDA multiple						7.0×	30%	57.6	9.3%	19.3%
K_U (ex CAPM)		10.0%	10.0%	10.0%	10.0%	10.0%	35%	51.5	11.8%	21.8%
SRP		14.7%	14.7%	14.7%	14.7%	14.7%	40%	45.4	14.7%	24.7%
Adjusted K_U		24.7%	24.7%	24.7%	24.7%	24.7%	45%	39.3	18.1%	28.1%
EV	45.4	65.1	79.9	93.5	108.2	125.0	50%	33.2	22.1%	32.1%
							55%	27.2	27.1%	37.1%
							60%	21.1	33.4%	43.4%
							65%	15.0	42.0%	52.0%
							70%	8.9	55.0%	65.0%

Table 11: FASHION Co.: Asset liquidation value.

€ million		Expected						Base					
		0	1	2	3	4	5	0	1	2	3	4	5
Working capital		30.0	32.6	32.2	31.9	31.7	31.4	30.0	30.9	30.9	31.0	31.2	31.2
Liquidation discount		80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Working capital liquidation value		6.0	6.5	6.4	6.4	6.3	6.3	6.0	6.2	6.2	6.2	6.2	6.2
Fixed assets		40.0	41.0	40.8	39.5	38.4	37.6	40.0	41.2	41.2	40.1	39.3	38.9
Liquidation discount		75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Fixed asset liquidation value		10.0	10.3	10.2	9.9	9.6	9.4	10.0	10.3	10.3	10.0	9.8	9.7
Other (non-booked) assets*		12.0	11.6	13.8	16.4	19.3	22.4	12.0	14.8	18.0	21.6	25.5	29.8
Liquidation costs**		–8.2	–8.5	–8.7	–8.8	–8.9	–9.1	–8.2	–8.7	–9.0	–9.3	–9.6	–10.0
Asset liquidation value (LV)		19.8	19.8	21.8	23.9	26.3	28.9	19.8	22.6	25.5	28.6	32.0	35.7
* Valuation based on sales (%)		10.0%	9.6%	11.3%	13.1%	15.0%	17.0%	10.0%	12.0%	14.0%	16.0%	18.0%	20.0%
** % on gross asset value	10%	82.0	85.2	86.8	87.8	89.3	91.4	82.0	86.9	90.0	92.7	96.0	99.9

Table 11: (continued)

€ million	Best						Worst					
	0	1	2	3	4	5	0	1	2	3	4	5
Working capital	30.0	31.5	32.1	32.9	33.6	34.4	30.0	34.9	33.9	32.9	31.9	30.9
Liquidation discount	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Working capital liquidation value	6.0	6.3	6.4	6.6	6.7	6.9	6.0	7.0	6.8	6.6	6.4	6.2
Fixed assets	40.0	41.3	41.5	40.6	40.1	40.0	40.0	40.8	40.2	38.5	36.9	35.3
Liquidation discount	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Fixed asset liquidation value	10.0	10.3	10.4	10.1	10.0	10.0	10.0	10.2	10.1	9.6	9.2	8.8
Other (non-booked) assets*	12.0	18.9	26.7	35.7	45.9	57.3	12.0	5.8	5.6	5.5	5.3	5.2
Liquidation costs**	–8.2	–9.2	–10.0	–10.9	–12.0	–13.2	–8.2	–8.2	–8.0	–7.7	–7.4	–7.1
Asset liquidation value (LV)	19.8	26.4	33.5	41.5	50.7	61.0	19.8	14.9	14.5	14.0	13.5	13.0
* Valuation based on sales (%)	10%	15%	20%	25%	30%	35%	10%	5.0%	5.0%	5.0%	5.0%	5.0%
** % on gross asset value	82.0	91.7	100.2	109.2	119.6	131.6	82.0	81.6	79.8	76.8	74.0	71.4

and shareholders. In theory and in practice, continuity should be the best solution when EV is greater than LV for all the parties involved. I will come back to this after estimating the value of the debt and equity. For now, I will focus on the comparison between EV and LV at the asset level, where, in our case, continuing as a going concern is expedient, even if it has to be negotiated and accepted by the investors involved in RP, such as creditors and shareholders, both current and potential.

Even if continuity emerges initially as the best solution, LV could still be relevant as a possible scenario when there is an unfavourable going-concern evolution. In other words, it is necessary to consider, at the valuation date, whether or not a liquidation option over the plan period should be identified, which should be valued to complement EV. This is taken into account, starting from the evolutionary dynamics of LV, in the different scenarios.

Given the dynamics of LV, it is possible to estimate the asset value with liquidation option (EV_L), comparing EV with LV year by year (see Table 12).

In the model, liquidation is carried out when LV is greater than EV, a circumstance that occurs in the example in the worst-case scenario at the end of the first year (in fact, also at time 0 in this scenario but, based on the expected value, liquidation would not be expedient at time 0).

Alternatively, liquidation could be assumed when two conditions are met: LV > EV, and liquidity (cash) is exhausted, with no possibility of access to new debt. This is a critical step, which obviously has negative effects mainly on outstanding debt value. Given, however, that in many cases, as in the example, most of the initial cash is derived from capital increase by new (or not) shareholders, they could tend to pursue the going-concern as long as cash allows, hoping circumstances will evolve favourably and taking into account that such behaviour would only worsen the position of creditors, since the equity value has already disappeared. In the example, liquidity would run out during the second year in the worst-case scenario, and this "deferral" would have a limited impact on value.

EV_L derives from discounting FCF and placing terminal value at LV when LV is higher than EV (end of the first year in the worst-case scenario in the example). The liquidation option value is estimated to be equal to the difference between EV_L and EV.

Even where LV is very limited at time 0 and/or its evolution in unfavourable scenarios is very negative, this step is still relevant since exercising the liquidation option limits the impact of negative FCF on EV. It should be noted, however, that such a scenario could not continue without the opportunity to access new finance to support going concern, hence, the possible maximum limit to the survival period given by liquidity. At the end, therefore, a simulation is carried out when LV equals 0, showing the liquidation option's positive value, even in this case, too.

Given the importance of the liquidation option, it is possible to simulate SRP to be used to discount forecasted cash flows (see Table 13). It is clear that the higher

Table 12: FASHION Co.: Enterprise value with liquidation option.

€ million	Expected						Base						Best						Worst					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
FCF		−12.7	1.0	3.9	5.2	6.2		−8.5	1.3	6.2	8.4	9.9		−6.8	3.2	8.5	10.7	12.4		−19.3				
EV	45.4	62.6	70.2	74.7	77.8	80.2	87.5	104.8	113.9	119.1	122.7	125.0	131.7	151.6	163.6	171.4	177.9	183.3	−27.7	−11.1				
LV	19.8	19.8	21.8	23.9	26.3	28.9	19.8	22.6	25.5	28.6	32.0	35.7	19.8	26.4	33.5	41.5	50.7	61.0	19.8	14.9				
TV		5.9				80.2						125.0						183.3		14.9				
K_U		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%				
EV_L[a]	54.9	73.0	72.8	76.2	78.6	80.2	87.5	104.8	113.9	119.1	122.7	125.0	131.7	151.6	163.6	171.4	177.9	183.3	−4.1	14.9				
Liquidation option premium	9.4						0.0						0.0						23.6					

[a]EV_L is computed as in Table 9 setting TV equal to LV when LV > EV (as at the end of year 1 in the Worst Case Scenario).

Table 13: FASHION Co.: Enterprise value (DCF model on base case forecasted FCF).

€ million						Base		Sensitivity analysis		
	0	1	2	3	4	5	Default probability	EV	SRP	Adj K_U
EBITDA		3.6	6.4	10.8	14.2	17.9	20%	74.5	3.2%	13.2%
FCF with debt tax shield		−8.5	1.3	6.2	8.4	9.9	25%	69.6	5.0%	15.0%
EBITDA multiple						7.0×	30%	64.7	6.6%	16.6%
K_U (ex CAPM)		10.0%	10.0%	10.0%	10.0%	10.0%	35%	59.8	8.4%	18.4%
SRP		10.3%	10.3%	10.3%	10.3%	10.3%	40%	54.9	10.3%	20.3%
Adjusted K_U		20.3%	20.3%	20.3%	20.3%	20.3%	45%	50.0	12.5%	22.5%
EV_L	54.9	74.5	88.3	100.1	112.1	125.0	50%	45.0	14.9%	24.9%
							55%	40.1	17.6%	27.6%
							60%	35.2	20.8%	30.8%
							65%	30.3	24.4%	34.4%
							70%	25.4	28.8%	38.8%

LV, the lower SRP, all other things being equal. SRP, therefore, discounts not only the distance between operating cash flows generated in the various evolutionary scenarios but also the presence of the liquidation option and its features.

10 The Value of Debt

The value of debt depends on cash flow to debt (CFD), broken down by debt class. Debt at the highest level of seniority (DIP) is first considered in the different scenarios (see Table 14).

To translate CFD into value, the debt expected return (cost) must be introduced here again in the CAPM environment (in line with EV estimate). Beta debt can be extrapolated from indications relating to low rated bonds.[24] Debt value is therefore given by the present value of expected CFDs discounted at the cost of capital (via CAPM).

Expected CFDs deviate from those forecasted as they are subject to the risk of negative events, reflected in the worst-case scenario, and do not benefit from the upside inherent in the best-case scenario.

If debt value is computed discounting the forecasted CFD, a default risk premium (DRP) will be added to the risk-free rate (not to the cost of capital via CAPM as SRP introduced in calculating the adjusted cost of unlevered capital, K_U). DRP can be calculated equal to the difference between the discount rate applied to the forecasted CFD that leads to the debt value (previously computed) and the risk-free rate, as exemplified in Table 14.

It should also be noted that the DIP value is higher than its nominal value. This is due to the fact that the nominal (or promised) rate of return on the DIP is higher than its fair cost.

For the sake of clarity, the fair cost of debt[25] can be understood according to two perspectives:

- If referring to expected CFD, this is the cost estimated via CAPM;
- If applied to forecasted CFD, it is given by the risk-free rate plus DRP (estimated according to the logic described above and illustrated in Table 14).

24 The beta debt values entered in our example are inspired by Duff & Phelps (2016), Appendix 3b. The values reported (average quarterly data for 2014 and 2015) by Moody's rating class are given as B, 0.54; Caa, 0.79; and Ca-D, 0.88.

25 Useful also for estimating the fair value of the debt in the balance sheet according to IFRS.

Table 14: FASHION Co.: DIP value.

€ million	Expected						Base					
	0	1	2	3	4	5	0	1	2	3	4	5
Nominal value	10.0	10.6	11.3	12.1	9.9	5.8	10.0	10.6	11.2	11.9	7.6	0.0
Cost of debt (nominal)	8.0%						8.0%					
CF to debt		0.2	0.1	0.1	3.1	4.9		0.2	0.2	0.2	5.2	8.2
EV_L + cash	78.9	83.6	81.5	86.9	90.1	87.6	111.5	119.5	129.1	139.6	145.6	140.5
Debt terminal value		4.2				0.0						0.0
Risk free rate (interest rate swap, 5-year)		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%
Beta debt		0.55	0.55	0.55	0.55	0.55		0.55	0.55	0.55	0.55	0.55
Debt risk premium (ex CAPM)		2.8%	2.8%	2.8%	2.8%	2.8%		2.8%	2.8%	2.8%	2.8%	2.8%
Cost of debt (ex CAPM)		3.8%	3.8%	3.8%	3.8%	3.8%		3.8%	3.8%	3.8%	3.8%	3.8%
Debt value	11.3	11.6	7.5	7.6	4.8	0.0	12.0	12.2	12.5	12.7	7.9	0.0
Forecasted CFD		0.2	0.2	0.2	5.2	8.2						
DRP		4.0%	4.0%	4.0%	4.0%	4.0%						
Cost of debt (fair value on forecasted CFD)[a]		5.0%	5.0%	5.0%	5.0%	5.0%						
Debt value	11.3	11.7	12.1	12.5	7.8	0.0						

Table 14: (continued)

€ million	Best						Worst					
	0	1	2	3	4	5	0	1	2	3	4	5
Nominal value	10.0	10.6	11.2	11.9	7.6	0.0	10.0	10.6				
Cost of debt (nominal)	8.0%						8.0%					
CF to debt		0.2	0.2	0.2	5.2	8.2		0.2				
EV_L + cash	155.7	168.0	182.3	197.8	209.1	219.7	19.9	18.7				
Debt terminal value						0.0		10.6				
Risk free rate (interest rate swap, 5-year)		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%				
Beta debt		0.55	0.55	0.55	0.55	0.55		0.55				
Debt risk premium (ex CAPM)		2.8%	2.8%	2.8%	2.8%	2.8%		2.8%				
Cost of debt (ex CAPM)		3.8%	3.8%	3.8%	3.8%	3.8%		3.8%				
Debt value	12.0	12.2	12.5	12.7	7.9	0.0	10.4	10.6				
Forecasted CFD												
DRP												
Cost of debt (fair value on forecasted CFD)[a]												
Debt value												

[a]Obtained using the excel function "Goal Seek" setting the debt value – as PV of forecasted CF (base case) – equal to the debt value through CAPM.

It is useful to note that in practice, the second perspective is the most widely used, as it reflects the debt pricing process, where nominal (promised) rates are negotiated to be applied to forecasted CFD.

At the DIP level, corresponding to a debt value higher than the nominal one, the fair cost of capital – understood from the second perspective as the required return on forecasted CFD – is lower than the nominal return.

Value and DRP for senior debt (see Tables 15 and 16) and junior debt (see Table 17) are estimated using the same logic.

In the example, the liquidation option impacts the value of DIP and senior debt, while it does not have any effect on junior debt, for which there is no residual flow from liquidation.

On senior and junior debt, as in many real cases, a significant difference appears between debt economic and nominal value, even after the write-off envisaged in the financial manoeuvre. This obviously depends on our assumptions and, in particular, on the nominal interest rate on debt lower than its fair value.

It should be noted that, in the worst-case scenario, senior debt essentially assumes the nature of equity in the sense that it becomes the recipient of the residual flows generated by the firm, including the liquidation value. In this case, its cost is estimated as residual return (as well as equity) according to the formula set out in Appendix. The estimate of the cost to be applied to the expected CFD accordingly becomes complicated, representing the weighted average cost of debt considered in different scenarios as exemplified in Table 15.

It goes without saying that this exposure, however complicated, appears to be simplified compared to real situations, where the classes of debt are generally more numerous, and the dynamics, including conditions for repayment, maturity, distribution of interest, and rights on asset liquidation values, are more complex. These elements can be managed analytically along the lines set out here (or along similar lines).

11 The Value of Equity

The equity value as a whole can be calculated as the difference between the value of assets and the value of debt, taking into account the liquidity available at the valuation date. This value must then be broken down into the different categories of shareholders, reflecting the equity waterfall (see Table 6). For this step, a simplified procedure can be adopted (see Table 18).

The starting point is the estimate of the implied cost of equity (K_E) given by the discount rate, which equals the present value of the total cash flows to equity (FCFE)

Table 15: FASHION Co.: Senior debt value.

€ million	Expected						Base						Best						Worst					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Nominal value	28.0	28.0	28.3	28.7	29.0	12.6	28.0	28.0	28.0	28.0	28.0	0.0	28.0	28.0	28.0	28.0	28.0	0.0	28.0	28.0				
Cost of debt (nominal)	3.0%						3.0%						3.0%						3.0%					
CF to debt		0.8	0.5	0.5	0.5	17.3		0.8	0.8	0.8	0.8	28.8		0.8	0.8	0.8	0.8	28.8		0.8				
EV_L + cash − debt (previous level)	67.5	72.0	74.0	79.3	85.3	87.6	99.6	107.3	116.6	126.9	137.7	140.5	143.7	155.8	169.9	185.1	201.2	219.7	9.5	8.1				
Debt terminal value		3.2				0.0						0.0						0.0		8.1				
Risk free rate		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%						
Beta debt		0.70	0.70	0.70	0.70	0.70		0.70	0.70	0.70	0.70	0.70		0.70	0.70	0.70	0.70	0.70						
Debt risk premium (ex CAPM)		3.5%	3.5%	3.5%	3.5%	3.5%		3.5%	3.5%	3.5%	3.5%	3.5%		3.5%	3.5%	3.5%	3.5%	3.5%						
Cost of debt (ex CAPM)		2.5%	4.5%	4.5%	4.5%	4.5%		4.5%	4.5%	4.5%	4.5%	4.5%		4.5%	4.5%	4.5%	4.5%	4.5%		−5.9%				
Debt value	19.5	19.1	16.1	16.3	16.6	0.0	26.2	26.5	26.8	27.2	27.6	0.0	26.2	26.5	26.8	27.2	27.6	0.0	9.5	8.1				
Forecasted CFD		0.8	0.8	0.8	0.8	28.8																		
DRP		10.3%	10.3%	10.3%	10.3%	10.3%																		
Cost of debt (fair value on forecasted CFD)		11.3%	11.3%	11.3%	11.3%	11.3%																		
Debt value	19.5	20.9	22.4	24.0	25.9	0.0																		

Table 16: bis:FASHION Co.: Cost of senior debt (worst scenario).

						Worst
	0	1	2	3	4	5
Cash	24.0					
EV_L	−4.1					
EV_L + cash	19.9					
DIP	10.4					
SD = E	9.5					
K_U		10.0%				
K_{DIP}		3.8%				
K_{CASH}		1.0%				
$K_{SD} = K_E$[a]		−5.9%				

[a]See Appendix.

at the equity value as a whole as previously estimated. FCFEs allocated to the various layers of the capital are then identified in order to calculate their present value at K_E.

Looking at the results, it emerges that the equity value for shareholders providing new cash is higher than their initial investment, with the consequent presence of an internal rate of return (IRR) higher than K_E. This IRR can be calculated and appreciated, both in relation to the expected FCFE and to the forecasted ones – the latter, in practice, is the preferred perspective.

As for EV, the cost of capital, including the specific risk premium, can also be estimated at equity level, starting from the forecasted FCFE and deriving the discount rate that equals their present value to that estimated on the expected FCFE. The calculation is proposed in Table 18 on total FCFE (i.e., total equity) and on FCFE for shareholders contributing cash.

At this point, it is also possible to estimate differentiated K_E over the various years of the plan, reworking the values obtained so far according to the formula in Appendix, applied in Table 19.

The equity value – obtained directly as the present value (at differentiated K_E) of the FCFEs – corresponds to the value previously estimated (residually) as EV minus D. Indeed, this step does not therefore add information content, but it does appear useful for checking that the DCF/APV is correctly applied.

12 Valuation Summaries

At this point, the main results obtained are shown (see Table 20), referring only to the expected values.

Table 17: FASHION Co.: Junior debt value.

€ million	Expected						Base						Best						Worst					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Nominal value	14.0	14.4	14.9	15.3	15.8	0.0	14.0	14.4	14.9	15.3	15.8	0.0	14.0	14.4	14.9	15.3	15.8	0.0	14.0	14.4				
Cost of debt (nominal)	3.0%						3.0%						3.0%						3.0%					
CF to debt		0.0	0.0	0.0	0.0	9.7		0.0	0.0	0.0	0.0	16.2		0.0	0.0	0.0	0.0	16.2		0.00				
EV_L + cash – debt (previous level)	48.0	52.8	57.9	62.9	68.8	87.6	73.4	80.8	89.8	99.6	110.1	140.5	117.5	129.3	143.0	157.9	173.6	219.7	0.0	0.0				
Debt terminal value		0.0				0						0.0						0.0		0.0				
Risk free rate		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%				
Beta debt		0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90	0.90	0.90		0.90				
Debt risk premium (ex CAPM)		4.5%	4.5%	4.5%	4.5%	4.5%		4.5%	4.5%	4.5%	4.5%	4.5%		4.5%	4.5%	4.5%	4.5%	4.5%		4.5%				
Cost of debt (ex CAPM)		5.5%	5.5%	5.5%	5.5%	5.5%		5.5%	5.5%	5.5%	5.5%	5.5%		5.5%	5.5%	5.5%	5.5%	5.5%		5.5%				
Debt value	7.5	7.9	8.3	8.7	9.2	0.0	12.4	13.1	13.8	14.6	15.4	0.0	12.4	13.1	13.8	14.6	15.4	0.0	0.0	0.0				
Forecasted CFD		0.0	0.0	0.0	0.0	16.2																		
DRP		15.8%	15.8%	15.8%	15.8%	15.8%																		
Cost of debt (fair value on forecasted CFD)		16.8%	16.8%	16.8%	16.8%	16.8%																		
Debt value	7.5	8.7	10.2	11.9	13.9	0.0																		

Table 18: FASHION Co.: Equity value.

€ million						Expected
	0	1	2	3	4	5
EV_L	54.9	73.0	72.8	76.2	78.6	80.26
Cash	24.0	10.5	9.4	12.8	14.5	11.2
EV_L + cash	78.9	83.6	82.2	89.0	93.1	91.4
DIP value	11.3	11.6	7.5	7.6	4.8	0.0
SD value	19.5	19.1	16.1	16.3	16.6	0.0
JD value	7.5	7.9	8.3	8.7	9.2	0.0
Debt to raise						22.3
Debt value	38.3	38.6	31.9	32.7	30.6	22.3
Equity value	40.6	45.0	50.4	56.3	62.5	69.1
FCFE[a]	−40.6	0.0	0.0	0.0	0.0	69.1
Implied cost of equity	11.2%					
Equity waterfall						
FCFE		0.0	0.0	0.0	0.0	69.1
Equity value for new cash (waterfall)						18.0
Equity value for new cash	25.6					43.5
FCFE new cash	−15.0	0.0	0.0	0.0	0.0	43.5
Internal rate of return for equity new cash	23.8%					
Equity value for SD write-off	6.0					10.2
Equity value for JD write-off	9.0					15.3
Equity total	40.6					
Forecasted FCFE		0.0	0.0	0.0	0.0	104.8
Distress risk premium	9.7%					
Cost of equity (fair value on forecasted FCFE)	20.9%					
Equity value	40.6					
Forecasted FCFE to new cash		0.0	0.0	0.0	0.0	67.4
Distress risk premium	10.2%					
Cost of equity (fair value on forecasted FCFE)	21.4%					
Equity value for new cash	25.6					

Table 18: (continued)

€ million						Base
	0	1	2	3	4	5
EV_L	87.5	104.8	113.9	119.1	122.7	125.0
Cash	24.0	14.7	15.2	20.4	22.9	15.5
EV_L + cash	111.5	119.5	129.1	139.6	145.6	140.5
DIP value	12.0	12.2	12.5	12.7	7.9	0.0
SD value	26.2	26.5	26.8	27.27	27.6	0.0
JD value	12.4	13.1	13.8	14.6	15.4	0.0
Debt to raise						35.7
Debt value	50.5	51.8	53.1	54.5	50.9	35.7
Equity value	61.0	67.7	76.0	85.1	94.7	104.8
FCFE[a]	−61.0	0.0	0.0	0.0	0.0	104.8
Implied cost of equity	11.4%					
Equity waterfall						
FCFE		0.0	0.0	0.0	0.0	104.8
Equity value for new cash (waterfall)						30.0
Equity value for new cash	39.2	0.0	0.0	0.0	0.0	67.4
FCFE new cash	−15.0	0.0	0.0	0.0	0.0	67.4
Internal rate of return for equity new cash	35.1%					
Equity value for SD write-off	8.7					15.0
Equity value for JD write-off	13.1					22.4
Equity total	61.0					
Forecasted FCFE						
Distress risk premium						
Cost of equity (fair value on forecasted FCFE)						
Equity value						
Forecasted FCFE to new cash						
Distress risk premium						
Cost of equity (fair value on forecasted FCFE)						
Equity value for new cash						

Table 18: (continued)

€ million						Best
	0	1	2	3	4	5
EV_L	131.7	151.6	163.6	171.4	177.9	183.3
Cash	24.0	16.4	18.7	26.3	31.3	36.5
EV_L + cash	155.7	168.0	182.3	197.8	209.1	219.7
DIP value	12.0	12.2	12.5	12.7	7.9	0.0
SD value	26.2	26.5	26.8	27.2	27.6	0.0
JD value	12.4	13.1	13.8	14.6	15.4	0.0
Debt to raise						45.8
Debt value	50.5	51.8	53.1	54.5	50.9	45.8
Equity value	105.1	116.2	129.2	143.3	158.2	173.9
FCFE[a]	−105.1	0.0	0.0	0.0	0.0	173.9
Implied cost of equity	10.6%					
Equity waterfall						
FCFE		0.0	0.0	0.0	0.0	173.9
Equity value for new cash (waterfall)						30.0
Equity value for new cash	61.6	0.0	0.0	0.0	0.0	102.0
FCFE new cash	−15.0	0.0	0.0	0.0	0.0	102.0
Internal rate of return for equity new cash	46.7%					
Equity value for SD write-off	17.4					28.8
Equity value for JD write-off	26.1					43.2
Equity total	105.1					
Forecasted FCFE						
Distress risk premium						
Cost of equity (fair value on forecasted FCFE)						
Equity value						
Forecasted FCFE to new cash						
Distress risk premium						
Cost of equity (fair value on forecasted FCFE)						
Equity value for new cash						

Table 18: (continued)

€ million						Worst
	0	1	2	3	4	5
EV_L	−4.1	14.9				
Cash	24.0	3.9				
EV_L + cash	19.9	18.7				
DIP value	10.4	10.6				
SD value	9.5	8.1				
JD value	0.0	0.0				
Debt to raise						
Debt value	19.9	18.7				
Equity value	0.0	0.0				
FCFE[a]	0.0	0.0				
Implied cost of equity	n.s.					
Equity waterfall						
FCFE		0.0				
Equity value for new cash (waterfall)						
Equity value for new cash	0.0	0.0				
FCFE new cash	−15.0	0.0	0.0	0.0	0.0	0.0
Internal rate of return for equity new cash	n.s.					
Equity value for SD write-off	0.0					
Equity value for JD write-off	0.0					
Equity total	0.0					
Forecasted FCFE						
Distress risk premium						
Cost of equity (fair value on forecasted FCFE)						
Equity value						
Forecasted FCFE to new cash						
Distress risk premium						
Cost of equity (fair value on forecasted FCFE)						
Equity value for new cash						

[a]Initial equity value included.

Table 19: FASHION Co.: Equity value (through FCFE, K_E).

€ million	Expected						Base						Best						Worst					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
FCFE and TV		0.0	0.0	0.0	0.0	69.1		0.0	0.0	0.0	0.0	104.8		0.0	0.0	0.0	0.0	173.9		0.0	0.0	0.0	0.0	0.0
K_U		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%	10.0%	10.0%	10.0%	10.0%		10.0%	10.0%	10.0%	10.0%	10.0%						
Cost of DIP		3.8%	3.8%	3.8%	3.8%	3.8%		3.8%	3.8%	3.8%	3.8%	3.8%		3.8%	3.8%	3.8%	3.8%	3.8%						
Cost of SD		2.5%	4.5%	4.5%	4.5%	4.5%		4.5%	4.5%	4.5%	4.5%	4.5%		4.5%	4.5%	4.5%	4.5%	4.5%						
Cost of JD		5.5%	5.5%	5.5%	5.5%	5.5%		5.5%	5.5%	5.5%	5.5%	5.5%		5.5%	5.5%	5.5%	5.5%	5.5%						
Cost of debt (weighted)		3.4%	4.5%	4.6%	4.6%	4.7%		4.6%	4.6%	4.6%	4.6%	4.7%		4.6%	4.6%	4.6%	4.6%	4.7%						
Return on cash		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%	1.0%						
Cost of equity (ex CAPM)		10.9%	12.0%	11.7%	11.1%	10.5%		11.0%	12.2%	12.0%	11.3%	10.7%		10.6%	11.1%	10.9%	10.4%	9.9%						
Equity value	40.6	45.0	50.4	56.3	62.5	69.1	61.0	67.7	76.0	85.1	94.7	104.8	105.1	116.2	129.2	143.3	158.2	173.9						

First of all, pre- and post-restructuring book values are taken and then economic values worked out in the SDCF underpinning the key conditions for acceptance of RP.

EV is, in the example, lower than the book value of invested capital, also considering the liquidation option value.[26] Debt value, compared to nominal value, is slightly higher for new finance and discounted for senior and junior debt (even post write-off), although partially offset by the value of the equity stakes offered to the debt-holders. The value for shareholders who contribute cash is higher than its nominal value (i.e., the expected return is higher than the cost of capital), while that of creditors is significantly lower than its nominal value (equal to debt write-off).

In Table 20, values in the presence of LV equal to 0 at time 1 are shown. Even in this condition, the liquidation option holds a positive value, although largely reduced, because of the possibility through liquidation to stop the negative FCF from the going-concern in the worst-case scenario.

Going-concern values thus summarized must be compared against liquidation values at time 0, before the start of RP, with the consequent contributions of new finance. In order to judge the suitability for continuity, it is therefore necessary to compare the going-concern value of capital including the liquidation option with the liquidation value of capital at time 0, articulating the analysis at assets, debt, and equity levels.

As shown in Table 20, DIP value appears higher than its nominal value, highlighting a positive (extra) return for the debtholders contributing cash. A positive net present value (premium) for investors providing fresh cash should be an essential incentive to promote investment in a distressed firm.

Senior debt (going-concern) value is slightly higher than its liquidation value, even before taking into account the equity value component. By adding the value of the equity component, the value of senior debt appears clearly higher than its liquidation value. Senior debt value before the equity stake would be lower than LV only in case of fading of LV to zero after the start of RP, but in this case, the value of LV at time 0 estimated here (and compared with the going-concern value) would be unrealistic (i.e., LV at time 0 should not decline to a null value in a year). And even in this case the total value of senior debt is higher than its liquidation value.

Junior debt appears, on the one hand, to be the one most affected by the write-off and the one with the higher discount between nominal and economic value in RP. However, at the same time, it is the one most favoured by continuity, given that its value in the event of liquidation is cancelled.

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26 This raises an issue of asset impairment (not highlighted here).

Table 20: FASHION Co.: Valuation summary.

€ million	Nominal value		Going-concern value		Liquidation value		Going-concern value with LV at time 1 equal to 0	
	Pre-restr	Post-restr	Value	(Discount)/Premium	Value	(Discount)/Premium	Value	(Discount)/Premium
Invested capital	70.0	70.0						
EV			45.4				45.4	
LV			19.8		19.8		0.0	
Liquidation option value			9.4				4.0	
EV_L			54.9				49.5	
Cash	4.0	24.0	24.0		4.0		24.0	
Debt	80.0	52.0	38.3	−26%	23.8	−54%	32.9	−37%
DIP	5.0	10.0	11.3	13%	5.0	0%	11.3	13%
SD	40.0	28.0	19.5	−30%	18.8	−33%	14.1	−50%
JD	35.0	14.0	7.5	−47%	0.0		7.5	−47%
Equity	−6.0	42.0	40.6	−3%	0.0		40.6	−3%
New cash		15.0	25.6	70%			25.6	70%
SD write-off		12.0	6.0	−50%			6.0	−50%
JD write-off		21.0	9.0	−57%			9.0	−57%
Total value for existing debtholders								
SD		40.0	25.5	−36%	18.8	−53%	20.1	−50%
JD		35.0	16.5	−53%	0.0		16.5	−53%

Table 21: FASHION Co.: Valuation sensitivity to worst scenario probability.

€ million	Worst scenario probability							
	0%	10%	20%	30%	40%	50%	60%	70%
EV	94.2	82.0	69.8	57.6	45.4	33.2	21.1	8.9
Liquidation option value	0.0	2.3	4.6	7.0	9.4	11.6	13.9	16.2
EV_L	94.2	84.3	74.4	64.6	54.9	44.8	35.0	25.1
Cash	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DIP	12.0	11.8	11.7	11.5	11.3	11.2	11.0	10.9
SD	26.2	24.5	22.7	21.0	19.5	17.6	15.9	14.2
JD	12.4	11.2	9.9	8.7	7.5	6.2	5.0	3.7
Total debt	50.5	47.4	44.3	41.2	38.3	35.0	31.9	28.8
Equity	67.6	60.9	54.1	47.3	40.6	33.8	27.1	20.3
New cash	42.6	38.4	34.1	29.8	25.6	21.3	17.0	12.8
SD write-off	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0
JD write-off	15.0	13.5	12.0	10.5	9.0	7.5	6.0	4.5
Total value for existing debtholders								
SD	35.6	33.7	31.9	30.0	25.5	26.3	24.5	22.6
JD	29.7	26.7	23.7	20.8	16.5	14.8	11.9	8.9

Valuation in a distressed firm, as in all businesses, is obviously based on the structure of the computation model and on the premises relating to market variables (including, first of all, the cost of capital), but depends to a large extent on projections concerning the firm's strategic and operational profile and, therefore, on the expected dynamics of cash flows from operations. In SDCF, assuming that many parties, even with different competencies and conflicting interests, have carried out an accurate analysis of forecasted cash flows, it is critical to assess the RP's probability of success and, therefore, the probability of occurrence assigned to the base scenario. A sensitivity analysis of the value of assets, debt, and equity to changes in the plan's probability of success is, therefore, essential and highlighted here by changing the probability assigned to the worst-case scenario[27] (Table 21).

Clearly, capital values are very sensitive to the probability of RP success. Analysis of RP's risk profiles, therefore, appears to be an essential step not only in the assessment of the feasibility of the business plan but also in the valuation process.

13 Conclusion

In this paper, I have provided a methodological approach for the valuation of distressed firms, dealing, in particular, with a case where the potential solution of the crisis requires significant changes in the firm's strategic-operational profile and financial structure.

Even in this context, valuation can be based on the cash flows expected to be generated by the firm in the light of a restructuring plan, which is the basis on which to negotiate and reach an agreement for maintaining or restoring business continuity among the many current and potential investors involved in the business restructuring process.

However, cash flows from operations cannot be treated as deterministic values but must be worked out in probabilistic/simulation terms, therefore, explicitly highlighting their risk profile. Risk will be higher the more advanced the stage of decline and the wider and deeper the scope of actions for change, in search of a new or renewed business continuity. Scenario projection—completed also by a Monte Carlo simulation—can be one of the methods to tackle the critical issue of risk inherent in cash flows and in the restructuring plan.

Nevertheless, any analytical procedure opens up numerous valuation uncertainties, deriving not only from methodological choices (as the application of SDCF, with a series of measures regarding the calculation of forecasted and

27 This procedure is suggested in order to more easily take into account the best-case scenario, whose probability of realization is proportional to that of the base scenario.

expected flows and discount rates), but also (and above all) from assumptions and hypotheses concerning the firm's competitive context, strategy, and business model, reflected in the business plan. A relatively simple but structured model such as the one presented here can be adapted to the nature of a specific restructuring case (always rather complicated and differentiated) and to highlight, in a transparent way, strategic-operational assumptions as well as the decisions concerning financial structure and their impact on value.

The presence of any market prices (for assets, debt, or equity) may be useful for comparing the values obtained through the application of a valuation model, returning, if necessary, to the assumptions relating to cash flow dynamics and the cost of capital.

References to the nature and characteristics of company-specific assets may also be used as support, not so much in order to apply a valuation inspired by the cost value of these assets, but to grasp the potential inherent in the resources, skills, and relationships accumulated by the firm. This wealth, when appropriately (re)valued and combined, where necessary with other assets, is still the basis for the success of a restructuring process, which is always very challenging.

Appendix: Cost of equity

Following Modigliani and Miller (Koller, Goedhart, and Wessels 2015, Appendix C), the unlevered value of assets (EV_U) plus the value of cash and the value of the debt tax shield net of cash[28] (for simplicity's sake, DTS) must be equal to the value of debt (D) plus the value of equity (E):

$$EV_U + Cash + DTS = D + E$$

And the expected returns (cost) on these values must observe the following equation:

$$K_U \frac{EV_U}{EV + Cash} + K_{DTS} \frac{DTS}{EV + Cash} + K_{Cash} \frac{Cash}{EV + Cash} = K_D \frac{D}{EV + Cash} + K_E \frac{E}{EV + Cash}$$

where:

$EV = EV_U + DTS$

K_U = unlevered cost of capital

K_{DTS} = cost of capital for the debt tax shield

K_{CASH} = cost (return) of cash

28 The tax shield is therefore understood to be estimated on interest expenses net of interest income.

K_D = cost of debt
K_E = cost of equity

Assuming K_{DTS} equal to K_U and breaking down the debt into DIP, senior and junior:

$$K_U\frac{EV}{EV+Cash}+K_{Cash}\frac{Cash}{EV+Cash}=K_{DIP}\frac{D_{DIP}}{EV+Cash}+K_{SD}\frac{D_s}{EV+Cash}+K_{JD}\frac{D_j}{EV+Cash}+K_E\frac{E}{EV+Cash}$$

The cost of equity will therefore be equal to:

$$K_E=K_U\frac{EV}{E}+K_{Cash}\frac{Cash}{E}-K_{DIP}\frac{D_{DIP}}{E}-K_{SD}\frac{D_s}{E}-K_{JD}\frac{D_j}{E}$$

Considering that:

$$EV=D+E-Cash$$

By replacing EV in the previous equation and reworking, we get:

$$K_E=K_U-(K_U-K_{Cash})\frac{Cash}{E}+(K_U-K_{DIP})\frac{D_{DIP}}{E}+(K_U-K_{SD})\frac{D_S}{E}+(K_U-K_{JD})\frac{D_J}{E}$$

Which can be further simplified by calculating the weighted average cost of debt (K_D)[29], as

$$K_E=K_U-(K_U-K_{Cash})\frac{Cash}{E}+(K_U-K_D)\frac{D}{E}$$

It should be noted that, referring to the net financial position (NFP = D – Cash), we can then use this equation (with the same result):

$$K_E=K_U+(K_U-K_{NFP})\frac{NFP}{E}$$

Where the cost of the NFP is given by:

$$K_{NFP}=K_D\frac{D}{NFP}-K_{Cash}\frac{Cash}{NFP}$$

29 where: $K_D=K_{DIP}\frac{D_{DIP}}{D}+K_{SD}\frac{D_S}{D}+K_{JD}\frac{D_J}{D}$

This cost of NFP is less immediately perceived than the cost of debt. In fact, when there is a considerable amount of cash, it is very far from the cost of debt.

Table 16 shows the values used to calculate the cost of senior debt (to be assimilated to equity) in the worst-case scenario at the end of the first year (when it is assumed liquidation is exercised, with the residual cash flow to the benefit of senior debt).

References

Altman, E. I., E. Hotchkiss, and W. Wang. 2019. *Corporate Financial Distress, Restructuring, and Bankruptcy. Analyze Leveraged Finance, Distressed Debt, and Bankruptcy*, 4th ed. Hoboken, NJ: John Wiley & Sons Inc.

Arzac, E. R. 1996. "Valuation of Highly Leveraged Firms." *Financial Analysts Journal* 52 (4): 42–50.

Bravo, S. 2019. "The Corporate Life Cycle and the Cost of Equity." *Journal of Business Valuation and Economic Loss Analysis* 14 (1): 1–14.

Broadie, M., M. Chernov, and S. Sundaresan. 2007. "Optimal Debt and Equity Values in the Presence of Chapter 7 and Chapter 11." *The Journal of Finance* 62 (3): 1341–1377.

Broadie, M., and O. Kaya. 2007. "A Binomial Lattice Method for Pricing Corporate Debt and Modelling Chapter 11 Proceedings." *Journal of Financial and Quantitative Analysis* 42 (2): 1–34.

Crystal, M., and R. J. Mokal. 2006. "The Valuation of Distressed Companies – A Conceptual Framework." *International Corporate Rescue*, Issues 2: 3.

Damodaran, A. 2009. *Valuing Distressed and Declining Companies*. New York: New York University, Stern School of Business.

Duff & Phelps. 2016. *Valuation Handbook – Guide to Cost of Capital*. Hoboken, NJ: John Wiley & Sons Inc.

Gilson, S.C., A.S. Ruback, and E.S. Hotchkiss. 2000. "Valuation of Bankrupt Firms." *The Review of Financial Studies* 13 (1): 43–74.

Koller, T., M. Goedhart, and D. Wessels. 2015. *Valuation: Measuring and Managing the Value of Companies*, 6th ed. Hoboken, NJ: John Wiley & Sons Inc.

Koziol, C. 2014. "A Simple Correction of the WACC Discount Rate for Default Risk and Bankruptcy Costs." *Review of Quantitative Finance* and *Accounting* 42 (4): 653–66.

Leland, H. E. 1994. "Corporate Debt Value, Bond Covenants and Optimal Capital Structure." *The Journal of Finance* 49 (4): 1213–52.

Leland, H. E., and K. B. Toft. 1996. "Optimal Capital Structure, Endogenous Bankruptcy, and the Term Structure of Credit Spreads." *The Journal of Finance* 51 (3): 987–1019.

Merton, R. C. 1974. "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates." *The Journal of Finance* 29 (2): 449–70.

Moyer, S.G, D. Martin, and J. Martin. 2012. "A Primer on Distressed Investing: Buying Companies by Acquiring Their Debt." *The Journal of Applied Corporate Finance* 24 (2): 59–76.

Riva, P., A. Danovi, M. Comoli, and A. Garelli. 2018. "Corporate Governance in Downturn Times: Detection and Alert – The New Italian Insolvency Code." In *Crisis Management. Theory and Practice*, edited by K. Holla. Chapter 9.

Srinivasan, S., and D. Lane. 2011. *The Risk-Reward Framework at Morgan Stanley Research*. HBS No. 9-111-011. Boston, MA: Harvard Business School Publishing.

S&P Global. 2018. *Recovery Rating Criteria for Speculative-Grade Corporate Issuers*. May. Also available at. https://www.maalot.co.il/Publications/CG20180528145440.pdf.

S&P Global. 2019. *Annual Global Corporate Default and Rating Transition Study*. May. Also available at. https://www.spratings.com/documents/20184/774196/2018AnnualGlobalCorporateDefaultAndRatingTransitionStudy.pdf.

Vincenzi, R. 2016. "Monte Carlo Valuation." In *Corporate Valuation. Measuring the Value of Companies in Turbulent Times*, edited by M. Massari, G. Gianfrate and L. Zanetti. Hoboken, NJ: John Wiley & Sons Inc. Chapter 4.