Accounting for Goodwill

Andrea Beretta Zanoni

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Introduction

This book proposes a method for the analysis and evaluation of intangible assets of an enterprise based on a breakdown process of the internally generated goodwill (also referred to as going concern goodwill). The main theoretical frameworks of the study are to be sought in the Residual Income Model, as regards the relation between abnormal earnings and enterprise value, and in the Resource Based View integrated by the Dynamic Capabilities Theory, as regards the role of resources and capabilities in the generation of competition differentials and value. Particular relevance is also borne by the studies on the evaluation of intangible assets, based on different theoretical sources (finance, accounting, management), and by the enterprise management theory originated in continental Europe (in particular, enterprise equilibrium theory). In line with these theoretical frameworks, the analysis can be based on the following two assumptions:

1. The internally generated goodwill corresponds to the overall value of not recorded intangible assets available to an enterprise. This can be measured through the capitalization of expected flows of abnormal earnings. This value, under specific conditions, corresponds to the difference between the enterprise value and the operating invested capital.
2. The internally generated goodwill may be broken down into its main components, bearing in mind that such operation is inevitably subject to approximations, given the fact that an enterprise is an organic system.

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Intangible resources play a fundamental role in OECD (Organisation for Economic Co-operation and Development) economies' change, from traditional scale-based manufacturing to new innovation-oriented activities (OECD 2000, 2001). Intellectual property, R&D, workforce training, brand, software, organizational capabilities, etc., all play a critical role since the content of knowledge and sophisticated capabilities incorporated in products and services have dramatically increased in the course of the

last century. Starting from the eighties, the mean market-to-book ratio of the S&P 500 companies has steadily increased, reaching in March 2001 the value of 6.0 (Lev 2001) (today, the value is lower, but in any case is above 4.0). Similar analyses carried out in other sectors, for example, on companies listed in the FTSE 100 in the UK, lead to similar conclusions, i.e., that almost 60 per cent of the value of enterprises is not reflected in balance sheets (Beattie & Thompson 2005). The increasing relevance of intangible assets can be also verified from a macroeconomic perspective. In 1999 Nakamura, using a broad definition of intangible investments, evaluated the U.S. gross investment in intangibles to be one trillion dollars annually (Nakamura 1999). According to a 2006 Federal Reserve Board analysis, investments in intangibles assets exceed all investments in tangible property (Corrado et al. 2006). These investments:

1. in system National Accounts (SNA) are oftentimes classified as intermediate expenses (excluded from the GDP calculation) and not as investments (included in the GDP calculation) (Bismuth & Tojio 2008);
2. by their own nature directly influence, more than any other investment, the future productivity growth of the system. It is estimated that these investments, if properly accounted for, would raise U.S. productivity growth by 20 per cent for the period 1973–1995 (Corrado et al. 2006).

In general, our ability to measure and evaluate the phenomenon, at the level of an individual enterprise and at a national level, is still very limited, since current measurement and evaluation methodologies are still in large part the result of theoretical attitudes that attribute to physical assets the role of main value drivers. The problem also extends to the capital theory. Shifting from an agricultural economy to a mercantile, and then later, industrial economy, the capital has become a specific production factor, which traditionally consists of a group—whose value is measurable—of durable goods that can be used in production processes and to which economic actors may claim a property right (capitalists). The concept later evolved, especially in the second half of the twentieth century, clearly shifting towards intangible, social and dynamic dimensions: let us take, for example, the theories of Human Capital (Schultz 1961, Becker 1962) or Social Capital (Bourdieu 1980, Coleman 1988), and then the rather variegated studies dedicated to the so-called Intellectual Capital (among others, Grindley & Teece 1997, Teece 1998, Teece 2000, Dzinkowsky 2000). The resulting scenario is on a theoretical level still in progress and it may also lead to a deep reconsideration of the traditional meaning of 'production factor', a fact that in part has already occurred in the theories of endogenous growth (Dean & Kretschmer 2007). In the meantime, however, the role of intangible assets is increasingly more relevant and the evaluation tools remain inadequate (Bismuth 2006).

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Accounting, Finance, Management and Strategy have tackled the problem of intangibles. As a result, analytical models have emerged, which are rather different from one another and can be classified into one of the following approaches (Sveiby 1997, 2002):

1. Market capitalization (MCM, Market Capitalization Methods), whereby intangible assets are estimated as a difference between the enterprise market value and the operating invested capital.
2. Return on assets (ROA), which is based on a calculation procedure that allows to go from profitability of the enterprise to profitability of intangible assets and therefore their value.
3. Direct estimate of the value of individual intangible assets (DIC, Direct Intellectual Capital methods). Among these, it is worth mentioning the methodologies for brand evaluation that, according to some, constitute another methodological group with specific characteristics (AIAF 2003). The same applies to the methodologies for the evaluation of the human capital.
4. Methods based on scorecards (Scorecard Methods), whereby the individual elements of the intangible property are first identified and then measured using indicators of a non-monetary kind.

The goodwill breakdown, intended as a process for the evaluation of the intangible capital, uses logics and instruments typical of the first three methodologies listed above, without however fully matching any of these. For example, as regards the classification of intangible capital, a more articulated classification of resources into five portfolios (technologies, techniques, relations with clients, relations with other stakeholders, aesthetics, taste and style attitudes) is preferred over the usual classification in structural, human and relational capital also accepted by EU's Meritum (Measuring Intangibles to Understand and Improve Management Project) (Meritum 2002). However, in this book, the analysis of intangible assets is driven, at every stage, by the evaluation and competitive interpretation of the enterprise goodwill. For this reason, different goodwill breakdown schemes are elaborated, each of them bearing specific information:

1. evaluation of the tax shield value;
2. assessment of the value of real goodwill and terminal goodwill;
3. estimation of the value of current and growth goodwill;
4. assessment of the value of business goodwill, corporate goodwill and risk compensation effect (RCE);
5. within business goodwill values, evaluation of system goodwill and positional goodwill (and related income effect and risk effect);
6. assessment of the value of distinctive capabilities;

7. estimation of the value of autonomously quantifiable intangible assets and reduced goodwill.

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This book is divided into six chapters. Chapter 1 deals with a few introductory issues, such as the economic meaning of the going concern goodwill, the role played by this value in relation to the objectives of enterprises and goodwill accounting procedures in business combinations. Chapter 2 first illustrates the main methods for goodwill evaluation and subsequently the first three breakdown schemes, which lead to the evaluation of the tax shield, real/terminal goodwill and current/growth goodwill. In Chapter 3, goodwill is broken down with reference to the business of the enterprise (business goodwill) and corporate activities (corporate goodwill). The differences between the risk of enterprise as a whole and the risk of each individual business cause the emergence of a phenomenon which will be later defined as risk compensating effect (RCE).

In Chapter 4, business goodwill and corporate goodwill values are further broken down, by means of the analysis of competitive phenomena that are related to these. The most relevant aspects are:

1. the abnormal earnings of an enterprise may be caused by structural phenomena (system goodwill) as well as by system positioning phenomena (positional goodwill);
2. since abnormal earnings mainly originate from enterprise resources, the goodwill can also be broken down according to the distinctive capabilities of an enterprise, through an evaluation of a differential kind.

Chapter 5 examines the last breakdown scheme of the going concern goodwill, relative to the identification and evaluation of intangible assets that have not been recorded. This breakdown scheme is based on the identification of a few intangible assets that, even though they cannot be recorded, fulfill a few requirements that make an extra-accounting evaluation possible. In this way, the goodwill value results from the sum of the value of all autonomously quantifiable intangible (and unrecorded) assets and a residual value (reduced goodwill). Finally, in Chapter 6 readers will find a comprehensive description of the different breakdown schemes joined into a single, concise framework. The book ends with an appendix written by Silvia Vernizzi and dedicated to a breakdown example of the going concern goodwill of Capitalia (Italian bank group) which emerged following the merger with Unicredit.

Milano, July 2008

1 Goodwill: Meaning and Relevance

THE HIDDEN VALUE OF ENTERPRISES

Goodwill is the part of the enterprise value that does not appear in financial statements but that emerges only when acquired (individually or in a business combination). It is a hidden value that, generally, the accounting standards define in the following way (in particular, see accounting standards SFAS 141, SFAS 142 and IFRS 3):

- the value of the future economic benefits;
- arising from assets that are not individually identified and separately recognized.

The internally generated goodwill (also known as going-concern goodwill) cannot be recognized by the accounting and recorded as an asset into the enterprise capital. However, at the same time, goodwill has become more and more relevant, because the origin of the value created by firms has gradually moved towards the economic phenomena of intangible nature. Goodwill is the synthesis, sometimes ambiguous and often very volatile, of just such phenomena. All that is enough to state that:

- goodwill weighs in a more and more relevant way on the overall enterprise value;
- goodwill is a value not easy to interpret and/or quantify; it needs to be analyzed and expressed through a theoretically reliable and sufficiently structured approach.

This first chapter deals with some introductory matters, functional for the later development of the book. In particular, this chapter is concerned with the following issues:

- the economic nature of goodwill, namely the existing relationship between goodwill and enterprises' abnormal earnings;

- the relationship between the goodwill value and firms' objectives;
- the link between goodwill and enterprises' intangible resources;
- finally, the rules established by the international accounting standards for the accounting of the goodwill, when business combinations occur.

THE ECONOMIC NATURE OF GOODWILL

To understand the economic nature of goodwill, it is necessary to introduce some basic notions about its determination. These preliminary considerations will be developed by assuming some simplifications concerning the adoption of a generic configuration of perpetual expected income, the hypothesis of an unlevered enterprise and the use of a single rate ke (cost of equity). More realistic discussions about evaluation methods will be provided in the second chapter. According to a theoretical definition, goodwill is equivalent to the capitalization of the abnormal earnings flows expected by the firm (Schmalenbach 1908, Zappa 1910, Besta 1922, Hatfield 1927),

$$G = [\frac{I - (ke \times B)}{ke}] \qquad [1.1]$$

G: goodwill
I: perpetual expected earnings flows
ke: cost of equity
B: equity book value
$I - (ke \times B)$: abnormal earnings

In this way, goodwill is directly evaluated through the capitalization of the abnormal earnings flows, which have to be intended as higher than the normal remuneration of the equity capital, given a specific configuration of an enterprise's risk. It is also possible to reach the goodwill value through a different approach, known as the indirect method. In fact, since the goodwill is a component of the overall enterprise value, given VE the economic value of equity, it will be:

$$VE = B + G$$

from which it is possible to infer that goodwill is also determinable through a differential approach as:

$$G = VE - B \qquad [1.2]$$

The value of goodwill, determined in this way (indirect approach), is more meaningful the more the accounting value of B has been adjusted and expressed at current value, in particular with respect to manufacturing facilities, plant, equipment, warehouse, investment in associates, fixed interest securities and deferred debts and credits. It is easily demonstrated that the value reached with both methods (direct and indirect) is the same. In fact, the preliminary hypothesis being unchanged, the VE value is equal to the capitalization of the total expected earnings flows. That is

$$VE = \frac{I}{ke} \qquad [1.3]$$

By comparing the two different evaluation approaches of goodwill, the following result is obtained:

$$\frac{I - ke \times B}{ke} = \frac{I}{ke} - B$$

and, therefore, it is possible to confirm the similarity of the two procedures:

$$\frac{I}{ke} - B = \frac{I}{ke} - B$$

It is interesting to remark the nature of the link between the economic value of the firm's equity and the profitability associated with it. In fact, just as the total value of VE is broken down into two different values (B and G), so the underlying earnings values are split into two flows: an average normal earnings flow and an abnormal flow:

$$I = In + Ia \qquad [1.4]$$

where:

In: average normal flow
Ia: abnormal flow

While Ia is determinable through the relation $[I - (ke \times B)]$, In is the average normal remuneration implicit in the equity book value, B. The example that follows is based, as mentioned at the beginning of this section, on the hypothesis of an unlevered firm (Figure 1.1).

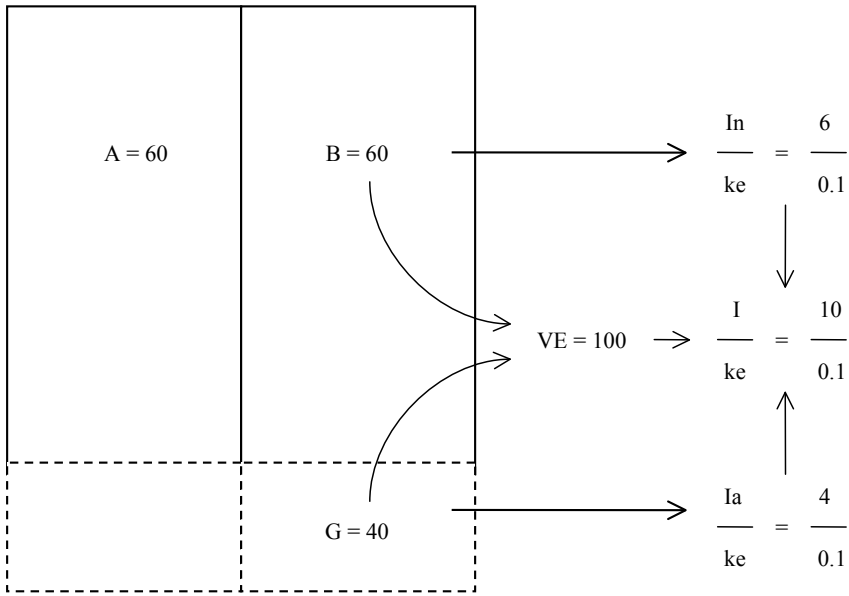

Figure 1.1 Economic value of equity, average normal earnings and abnormal earnings.

I: perpetual expected earnings flow = 10
ke: cost of equity = 0.1
VE: economic value of equity = 100 = (10/0.1)
B: equity book value = 60 = assets value
Ia: abnormal earnings (10–6) = 4
G: goodwill = 40 = (4/0.1) = (100–60)

The total flow equal to 10 has been broken down into an abnormal earnings flow equal to 4 (which being remunerated at 10 per cent leads to a goodwill value of 40) and a flow equal to 6, which represents the average normal remuneration of B (remunerated at 10 per cent).

***

The relevance of goodwill in determining the market value of the equity changes according to circumstances such as, for instance, the features of the competitive arena in which the firm works. Focusing the analysis on the variables examined, it is possible to work out the following relation (Ohlson 1991, 1995):

$$VME = \beta \times I + (1-\beta)B + \alpha \qquad [1.5]$$

where:

- VME: equity market value
- *β:* parameter positively related to the persistence of abnormal earnings and negatively related to the cost of capital (ke)
- *α:* other information.

In the borderline case in which β reaches the maximum value of 1 (perpetual persistence of abnormal earnings), the book value becomes insignificant for the estimation. In contrast, the more the value of β is low—small persistence of abnormal earnings—the more the book value plays an important role in the determination of the equity market value. It stands to reason that the goodwill value takes shape just when the price to book value ratio is greater than 1. That ratio, in fact, identifies the relationship existing between the equity market value VME and the equity book value B. Assuming a rational behavior of the market and simplifying the analysis, the value of VME will depend on the future earnings of the enterprise and on the capitalization rate applicable to them (equalizing in this sense the VE value), that is:

$$VME = \frac{I}{ke} = VE \qquad [1.6]$$

Dividing everything for the book value of the equity, B, it results:

$$\frac{VME}{B} = \frac{ROE}{ke}$$

from which it is possible to infer that the price to book ratio is equal to the ratio between the expected return of equity (ROE = $\frac{I}{B}$) and the opportunity cost of equity (ke): if this ratio is equal to 1 (ROE = ke), the market value of equity should tend towards its book value. Instead, it stands to reason that the goodwill area of value takes shape where:

ROE > ke

Of course, the inclination of the straight line (in Figure 1.2) will depend on the value of B, as is demonstrated by the numerical example shown in the figure. It is necessary to add another consideration: in defining ROE = $\frac{I}{B}$ it has been implicitly assumed that the ratio ROE expresses the profitability at the current conditions whereas the market value embodies also growth expectations. Let us assume the following data:

- book value of equity (B) = 20
- ROE = 30%
- ke = 8%
- $\frac{ROE}{ke} = 3.75$
- VME = 100
- price to book value $\frac{P}{B} = 5$

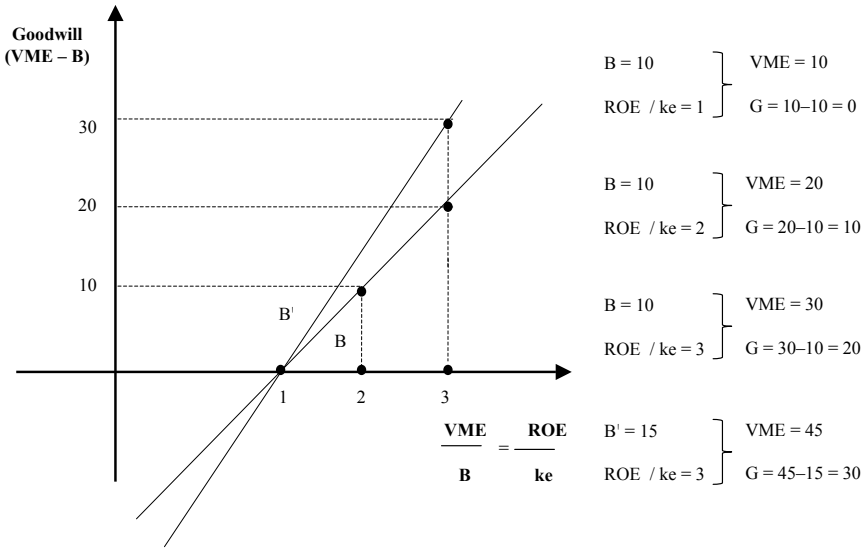

Figure 1.2 Goodwill and ROE/ke ratio.

With a price to book value equal to 5, the market value sustained by ROE (current profitability projected in perpetual) is equal to 75 (20 × 3.75). About this value we know that 20 is traceable to the book value and 55 is traceable to the capitalization of the current abnormal earnings. The remaining value of 25, instead, is not sustained by current profitability, but it embodies growth conditions (Figure 1.3).

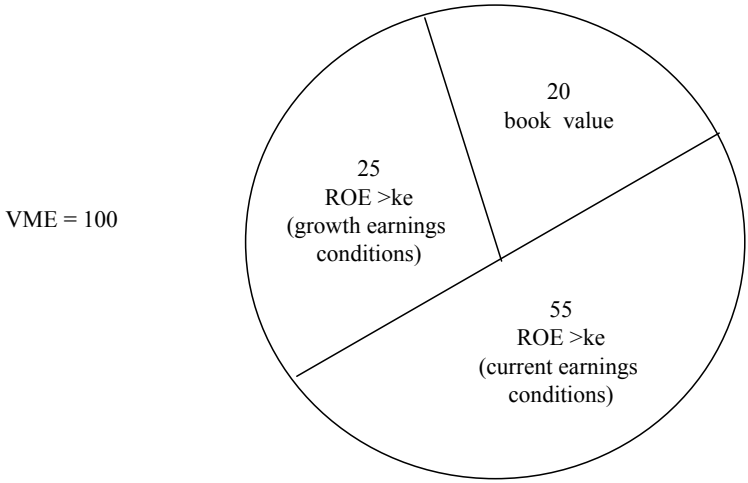

Figure 1.3 Book value, current earnings conditions and growth earnings conditions.

The relation between the current profitability and the growth is shown in Figure 1.4, where the ratio between market value and book value is a function of the difference between ROE and ke, with the growth that determines the inclination of the line.

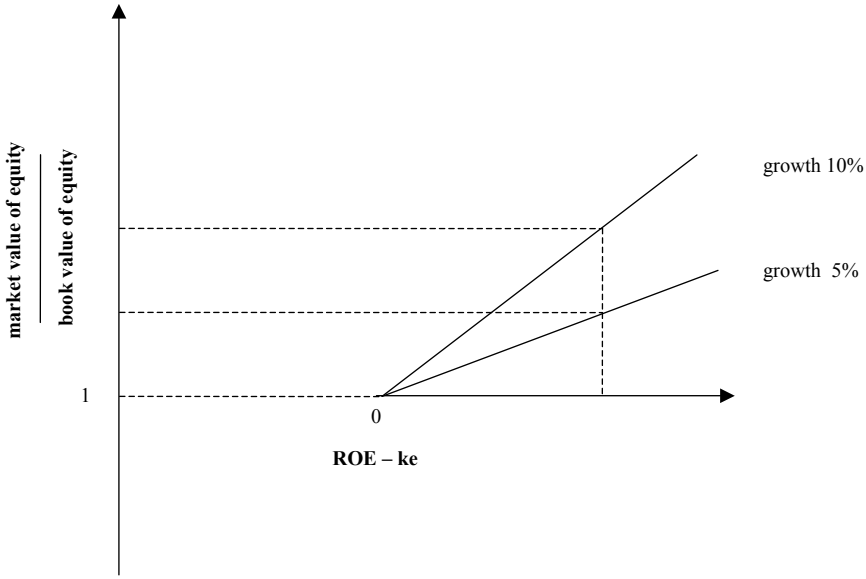

Figure 1.4 Relation between current profitability and growth.

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Therefore, the goodwill is that part of the enterprise's value that exceeds the equity book value:

- in part because of the conservative accounting methods, due to the historical cost convention and to the necessity of evaluating in a prudent way the assets (in any case, the progressive shift since the mid-1990s toward a fair value approach to reporting losses and gains must be borne in mind) (Cotter & Donnely 2006);
- most of all, because of the value of abnormal earnings expected for a specific future period, based on the hypothesis assumed about current profitability and growth.

THE GOODWILL AND THE OBJECTIVE FUNCTION OF FIRMS

What role does goodwill play in the objective function of a firm operating in a free market? Assuming an institutional point of view, goodwill

becomes a relevant value to identify and estimate the objectives of an enterprise (Zappa 1957, Schmalenbach 1949, Amaduzzi 1978, Beretta Zanoni 2006). Unlike what happens in contractualism or neo-institutionalism, the institutional perspective considers the enterprise as an autonomous institutional entity that tends to its own evolution, driven by the main objective to survive over time. In other words, the ultimate objective of firms is their own existence, through the maintenance, in the long term, of their economic equilibrium. In a free market economy, economic equilibrium can be achieved by remunerating, at market conditions, all the resources employed and by assuring the enterprise an additional quantity of financial resources necessary for its future development. Since the goodwill expresses the value of the abnormal earnings expected in the future, it indicates the expected capability of the firm to:

- remunerate, at market terms, all the production factors, including the risk capital;
- generate an additional value (economic profit) that can be addressed at different purposes, defined from time to time (self-financing and additional return for risk capital);
- do all things mentioned before from a perspective of stability (survival in the long term).

How do these conclusions interrelate with the objectives of the different economic actors, shareholders or other stakeholders, and consequently, with the shareholder and stakeholder theory (Driver & Thomson 2002)? It is necessary first to state that the maximization of the goodwill value does not correspond to the maximization of the cash flows due to shareholders. In the long term, the maximization of the goodwill implies a shareholder remuneration in line with the market, similar to the remuneration of any other supplier of resources. On the other hand, to be in line with the market is not a per se objective, but it is functional to the maintenance of resources into the enterprise's system. Moreover, the institutional perspective suggests the idea according to which the enterprise has its own objective.

This autonomy depends, in principle, on two aspects:

- the social relevance of the firm, that is to say, the multiplicity of interests that converge on its activity;
- its tendency, appropriate to each institution, to outlive the subjects that at the time gave birth to it; in this sense, it is undoubtedly that the enterprise tends to achieve the objectives of the subjects that manage it, but in doing this, the institution tends to outlive the subject or the groups of subjects that, at different times, have the decision-making power.

While the first aspect is completely understood by the stakeholder theory, the second one is just partially included in it (Freeman 1984, Mitchell et al. 1997, Phillips et al. 2003). Consider the following examples. An enterprise remunerates its employees with a value of 100, a value at market conditions, reaching an abnormal earning equal to 15 and having, in this way, different options. It can remunerate the shareholders at the market conditions and allocate the abnormal earnings value to reserve, as a source of capital useful for future investments. It can also remunerate shareholders at better conditions than the market does, and it can allocate a relevant part of the economic profit to reserve, for example, a value equal to 10—all this, after having remunerated the work factor at market conditions. Other variables being equal, the following situations are now presumed.

1. The firm increases the employees' remuneration from 100 to 110, exceeding in this way the market conditions. The enterprise acts in this way because it considers the motivation of its human resources or the motivation of a part of them to be a key factor. Naturally, in this situation the economic profit decreases in comparison with the starting situation, from 15 to 5.
2. The enterprise increases the employees' remuneration from 100 to 120. The reasons are the same as those mentioned in the previous point. However, the economic profit becomes negative, equal to –5.
3. The enterprise increases further the remuneration of its employees, so as to obtain an out and out loss (costs greater then revenues).
4. The enterprise, in contrast to the previous three points, decreases the employees' remuneration from 100 to 90, to gain a maximization of the economic profit, which, in this case, becomes equal to 25.

Hypothesis number 1 consists, essentially, in shifting resources, at least for a certain period of time, towards the labour factor. The residual result (economic profit) suffers from this shift, but continues to remain positive. A positive economic profit allows the firm to remunerate shareholders at market conditions. In this way the margin is reduced and the firm has to choose between the over-remuneration of shareholders and the allocation to reserve. In situation number 2, instead, the economic profit becomes negative. It means that shareholders cannot be remunerated at market conditions. Compared with the previous situation, shareholders result in being visibly penalized. Not only that, but with negative economic profit the enterprise does not allocate any funds to reserve. In brief, the situation represented in point 2 is not compatible with the objective function of the firm and is tolerable for short periods of time only, and for specific reasons. The situation represented in point 3 is not acceptable: not only does the economic profit become negative, but also the income becomes negative. In this case the value is clearly destroyed:

- the enterprise does not have any margin for investments;
- the enterprise not only cannot remunerate the shareholders but it has also to ask them to restore the initial wealth conditions (destruction of value).

The situation in point 4 is the opposite of the three mentioned above. In this case the enterprise decides to penalize the labour factor, remunerating the employees at disadvantageous conditions compared with the market ones. The consequences of this for the economic profit are clear: the enterprise has higher margin with regards to both the remuneration of the equity and the investments (reserve). But this higher margin is reached at the expense of the main stakeholders. Therefore, according to the institutional point of view, this is a very controversial choice because almost certainly it implies an increase of the firm's risk to compromise its own probabilities to survive over time. Moreover, the increase of risk weighs negatively on the goodwill value, determining a higher value of the actualization rate. Similar to the situation described in point 2, it seems not to be compatible with the objective function of the firm and, at most, can be tolerated only for a short period of time.

THE GOODWILL AND THE INTANGIBLE RESOURCES

The goodwill can also be defined as the overall value of intangible resources that are not recorded. The relationship between unrecorded intangible resources and an enterprise's earnings is quite clear (Gu & Lev 2001). If we define the firm as a coordinated complex of production resources, then its economic performance (I) depends on the way in which three areas of specific production factors are used, i.e., physical assets, financial assets (shares, securities, financial instruments, etc.) and intangible assets.

$$\mathrm{I} = \alpha \text{ Physical Asset} + \beta \text{ Financial Asset} + \delta \text{ Intangible Asset} \quad [1.7]$$

with α β δ equal to the hypothetical rate of return of different assets. According to this perspective, the value of intangible assets would be equal to the capitalization, at the rate δ, of the flows obtained from the difference between normalized earnings (I) and the return on physical and financial assets, determined, respectively using the rate α and β. Therefore, with PA physical assets, FA financial assets, IA intangible assets and I normalized earnings:

$$IA = \frac{I - (\alpha PA + \beta FA)}{\delta} \quad [1.8]$$

This approach suffers from two limitations that it is necessary to bear in mind before continuing with the analysis.

- The earnings' flow is broken down into partial flows, attributable to specific categories of assets; from both a theoretical and an operational point of view, the breakdown of the earnings in relation to specific categories of assets is somewhat controversial, because earnings are an aggregate flow, which comes from the synthesis of assets and not from their simple sum (Zambon et al. 2003).
- The productive capability of the specific resources is not homogeneous and constant during the period of time in which benefits appear. In particular, the return of intangible resources expresses itself in a greater period of time compared with what happens to the physical and financial resources.[1]

Thus, with some simplification, the goodwill value

$$G = \frac{I - (ke \times B)}{ke}$$

can be explained in the following way (unlevered enterprise): given PA physical assets, FA financial assets and IA intangible assets (net values), the formula of autonomous evaluation of goodwill can be written, in the most simple formulation, as:

$$G = \frac{(\alpha PA + \beta FA + \delta IA) - (ke \times B)}{ke}$$

Assuming that intangible resources recorded by the accountability do not exist, or excluding these resources from the equity capital (B) and including them in the generic expression IA:

$$G = \frac{(\alpha PA + \beta FA + \delta IA) - ke(PA + FA)}{ke}$$

$$G = \frac{PA(\alpha - ke) + FA(\beta - ke) + \delta IA}{ke} \qquad [1.9]$$

Is it possible to think that α and β are essentially in line with the ke rate (cost of the risk capital invested in that specific enterprise)? Since all the physical and financial assets are available on the market and since they are usable in a similar way by many competitive actors (the hypothesis of the normality of returns comes from this assumption), their possible abnormal return can approximately be attributed to the capabilities/assets of an idiosyncratic nature and therefore to the intangibles owned by the enterprise. In other words, the possible differences (α – ke) and

(β – ke) are traced to the role played by IA and, therefore, included in the expression δ IA. Thus, the value of G depends exclusively on the expected and capitalized return of the intangible assets (with δ that converges towards ke):

$$G = \frac{\delta IA}{ke} \cong IA$$

It is possible to understand the nature of the relationship between ke and δ also equalizing the formula of the goodwill determination to the intangible assets formula developed with Lev's method. Starting from a common value I (normalized earnings), let us equalize the two expressions:

$$\frac{I - ke(PA + FA)}{ke} = \frac{I - (\alpha PA + \beta FA)}{\delta}$$

If ke and δ converge, and if we let change α and β, then the equality is verified when:

$$PA(\alpha - ke) = FA(ke - \beta)$$

that is to say, when the ke value, equal to δ, is equal to the weighted arithmetic mean of the two rates α and β.

$$ke = \frac{\alpha PA + \beta FA}{PA + FA} \qquad [1.10]$$

THE GOODWILL ACCORDING TO ACCOUNTING STANDARDS

The accounting standards deal with the purchased goodwill excluding the possibility of recording the goodwill internally generated by firms (Jennings & Thomson 1996). The accounting treatment of goodwill is a very complex item, widely reported by the international literature. The current accounting standards tendency is the result of the debate developed in the 1990s in both the United States and Europe, as well as the result of the problems linked to some distortions that characterized the so-called new economy. For the purpose of this work, it is sufficient to focus exclusively on:

- the goodwill arising from a business combinations;
- the accounting standard IAS/IFRS and SFAS.

The accounting standards SFAS 141 (business combination) and IFRS 3 (business combination) have been recently reviewed (respectively

December 2007 and January 2008). Previously the accounting standards IFRS 3 and SFAS 141 provided the use of the purchase method, according to which the assets and the liabilities of the firm acquired in a business combination have to be recorded on the basis of their fair value. The goodwill emerging from the combination is equal to the difference between the price paid by the acquirer for the control participation and the fair value of the acquired entity's net assets (pro quota). Therefore, the accounting record of the goodwill is based on the cost incurred for the business combination. Let us suppose that, for example, enterprise A acquires a capital share of 60 per cent in firm B, at a price of 140. Moreover, let us assume that the net value of the acquired firm's assets is equal to 200 and that this firm is entirely financed by its own capital. Finally, let us assume that the assets' book value is equal to 100. In the consolidated accounts of the acquirer, the following values would result:

- on the assets side would be recorded the current net value of the acquired assets, equal to 200 and a goodwill equal to 20, obtained by the difference 140–120, that is to say, equal to the difference between the price paid and the pro quota value of the assets (60 per cent of 200);
- on the liabilities side, in minorities capital, would be recorded the value of 80 (40 per cent of 200).

The difference between the value on the assets side (220) and the value on the liabilities side (80) leads to 140. For the sake of completeness, it is necessary to bear in mind that according to the pooling of interest method (criterion allowed by the previous IAS 22 and, under specific conditions, by the Auditing Practices Board Opinion [APB], n. 16, issued in the 1970s) the accounting of our example would have been different:

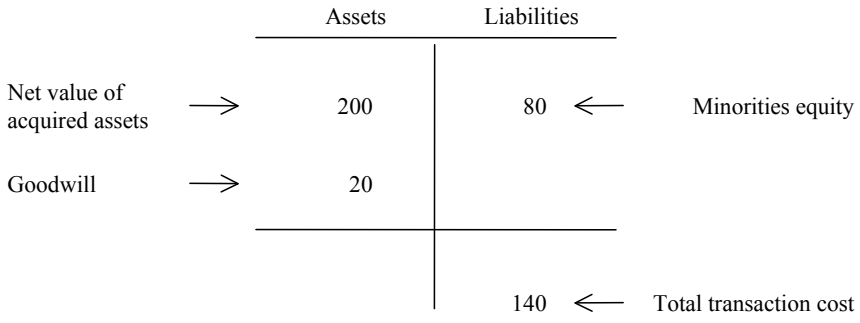

Figure 1.5 Purchase method.

- the assets side of the acquirer's consolidated financial statement would have shown the same value of goodwill, equal to the difference between 140 and 120 (20), but the net value of the assets acquired would have been written at fair value for the acquirer's proportionate share (60 per cent of 200, equal to 120) and at book value for the minorities' proportionate share (40 per cent of 100, equal to 40), therefore, for a total value of 160 (instead of 200);
- on the liabilities side, in the minorities' interest, it would be written the value of 40 (instead of 80).

The pooling of interests allows the consideration of the accounting values of the acquired entity in a continuity perspective: from a theoretical point of view, this method should be applied to those situations in which the business combination is determined by the union of the pre-existing properties rights through an exchange of shares (Johnson 1999, Johnson & Petrone 2001), that is to say, in situations in which it would not be possible to identify a real acquirer.

Let us proceed to the analysis of the innovations brought in the SFAS 141 and in the IFRS3. The most relevant change is represented, for both standards, by the passage from the purchased method (based on the business combination consideration transferred) to the acquisition method (based on the fair value of the acquired firm as a whole) and by the introduction of the full goodwill. According to the acquisition method, the reference value is no longer the cost incurred for the business combination but rather the fair value of the acquired firm. Namely, the acquirer has to record the total fair value of the acquired firm at the acquisition date, even if it has not acquired the entirety of the firm's shares. The goodwill value is determined as the difference between:

- the sum of acquisition date fair value of the consideration transferred and the amount of any non controlling interest in the acquiree;
- the fair value of any identifiable assets acquired and liabilities assumed.

Whereas the SFAS 141 requires the non controlling interest value to be measured at fair value (with the consequent record of a full goodwill), the IFRS 3 allowed the possibility to measure that value either at fair value or at proportionate share of the acquiree's identifiable net assets: this second hypothesis, in fact, comes back to the accounting model provided by the purchased method. The measurement of the minorities' fair value is based, if existing, on the active market price for the equity shares not held by the acquirer. Where these prices are not available, alternative evaluation techniques should be used. Let us consider the numerical example mentioned above, adding new information related to the fair value of the acquiree as a whole (firm B) assumed equal to 230. The outstanding values of the business combination are the following ones:

- the fair value of the consideration transferred, equal to 140;
- the net identifiable assets, equal to 200;
- the value of the non controlling interest (measured as a proportion of the net identifiable assets), equal to 80 (40 per cent 200);
- the fair value of the non controlling interest (measured, in this case, as the difference between 230 [100 per cent of the entity value] and 140 [price paid for the 60 per cent of the shares]), which is equal to 90;
- the goodwill value, if the non controlling interest was measured as proportion of the net identifiable assets, would be equal to 140 + 80–200, which is equal to 20 (the same result obtained with the method already analyzed);
- the full goodwill value, instead, if the non controlling interest was measured at fair value, would be equal to 30 (140 + 90–200); the same result is determined through the difference between the fair value of the acquiree as a whole (230) and the net value of the identifiable assets (200).

According to the full goodwill logic, the acquirer's consolidated financial statement will show the following values (see Figure 1.6):

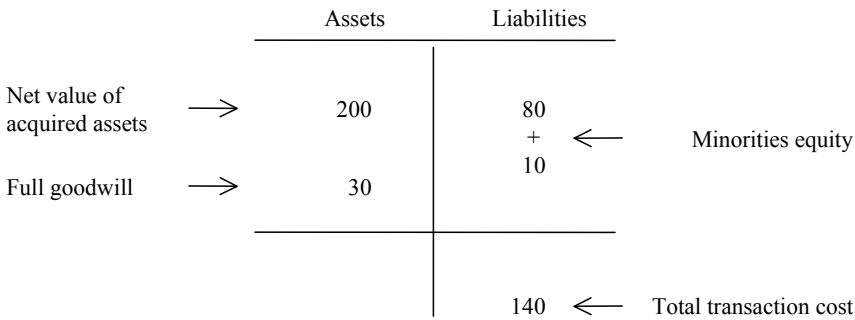

Figure 1.6 Acquisition method.

- on the assets side is recorded the current net value of the assets of the acquired firm, which is 200, and the full goodwill value of the acquiree as a whole, equal to 30;
- not only is the net assets value attributable pro quota to the minorities but, according to the full goodwill method, also the goodwill value is attributable to the minorities; in fact, the value of 30 (full goodwill) is in part attributable to the majority and in part attributable to the minority; the goodwill traceable to the majority can be evaluated as the difference between the transaction cost (140) and the value of assets pro quota, equal to 120, and, therefore, it results equal to 20;

- on the liabilities side the minorities capital will still be equal to 80 (40 per cent of 200) but plus the share of minorities' goodwill, equal to 10, obtained by the difference between the full goodwill (30) and the goodwill attributable to the majority equal to 20.

In the consolidated accounts, the difference between the sum of what has been recorded on the assets side (200 + 30 = 230) and what has been recorded on the liabilities side leads to the value of 140, which is the total transaction cost. On the other hand, on the assets side is recorded the full value of the acquired firm's goodwill (in our example equal to 30). This value also includes the goodwill attributable to the minorities. In this way the goodwill value represented on the assets side is independent from the extent of acquired capital share.

Finally, a brief mention of another rare eventuality. Sometimes, in fact, the difference between the total cost incurred by the acquirer for the business combination and the net fair value of the assets and liabilities acquired is negative. In this case, a negative goodwill emerges. The negative goodwill represents a positive earning component for the acquirer firm and it has to be computed into the income statement. This phenomenon has different causes of accounting and economic nature. Leaving the accounting causes aside and paying attention to the economic ones, the negative goodwill can be explained as an advantageous acquisition for the acquirer, who finds a seller willing to sell its firm at a value lower than the fair value of its net assets.

THE COMPONENTS OF GOODWILL IN A BUSINESS COMBINATION

The accounting goodwill emerging from a business combination is a composite value that, from a theoretical point of view, can be broken down into the following six elements:

1. the difference between the fair value of the net assets acquired and their accounting value, traceable to both accounting mistakes attributable to the acquired firm and to the already mentioned accounting standards' conservative tendency;
2. fair value of intangible assets not emerging in the financial statement of the acquired firm;
3. internally generated goodwill of the acquired firm stand-alone (going-concern element), traceable to the capitalization of the expected economic profit (abnormal returns) of the acquired firm, regardless of the business combination;
4. divisible synergies, that is to say, the actual value of the economic profits that the acquired firm is able to achieve thanks to its entrance into the acquirer's sphere of control;

5. indivisible synergies, that is to say, the actual value of the economic profit achievable by the acquirer thanks to the business combination (including the control premium);
6. over- or under-evaluation of the price paid for the combination, due to the method of payment or to the negotiation phase.

Without dwelling on the explanation of the economic nature of each component, it is possible to observe that the core goodwill, which is the value actually traceable to the abnormal earnings capitalization, is limited to items 3, 4 and 5, namely, to the going-concern element and to the divisible and indivisible synergies. Moreover, the synergies value has significance just in relationship to the specific business combination (it is not internally generated by the enterprise). Only items 3 and 4 would be divisible pro quota between the majority and minorities, while item 5 (indivisible synergies) is by its own nature not divisible and, therefore, it should not contribute in constituting the minorities' goodwill. Let us see, now, how this aspect is regulated by the full goodwill accounting method. The accounting standard reminds that (see IFRS 3 B45) the fair value of the acquirer's interest in the acquiree and the non controlling interest on a per share basis might differ, as in fact it happens to in the example mentioned above. Actually, the value of the full goodwill, in the example equal to 30, is not proportionally shared between the majority and minorities. In fact, if it was proportionally shared, the majority would have had a value equal to 18 (60 per cent of 30) and the minorities would have had a value of 12 (40 per cent of 30). Only a part of the full goodwill value is subjected to division, theoretically, the divisible part, while the indivisible part should remain exclusively in the controller's hands. This proposition will be further explored in the following numerical example. The goodwill attributable to the majority is calculated as the difference between the price paid (140) and the pro quota net assets value (120). The price paid is higher by 2 in respect of 60 per cent of the firm's fair value (60 per cent of 230 = 138). This happens because within the price are included phenomena tied in a contingent way to the transaction and to the acquirer's interests, such as the control premium. This part of goodwill cannot be attributed to the minorities. Numerically, the value attributed to the minorities, 10, is equal to 40 per cent of the divisible part, that, therefore, would result equal to 25 (in fact 40 per cent of 25 is equal to 10). Then it is possible to affirm that in the value of 20 attributable to the majority is included:

- the proportional part of the divisible value (60 per cent of 25, equal to 15);
- 100 per cent of the indivisible part, equal to 5.

***

The results of research carried out in the United States studying 1,576 business combinations during the period from 1990 to 1994 clarify this

situation. Henning et al. (2000) have broken down the value arising from the difference between the price paid for the combination and the accounting equity, by using all the information coming from the financial statements of the firms involved and, in part, from the financial market. The difference between the two values has been broken down into four components:

- the increase, or the decrease, of value due to the difference between the fair market value of physical and intangible assets of the acquired firm and their accounting value;
- the goodwill value of the acquired entity stand-alone, namely going-concern goodwill, determined as the difference between the market value of the acquired firm six days previous to the first communication to the market (pre-offer market target price) and its equity expressed at current value;
- the evaluation of the synergies emerging from the combination, synergy goodwill, expressed by the market and calculated on the basis of the net increments of the market prices of the enterprises involved in the business combination, with reference to the eleven days subsequent to each communication concerning the combination;
- the residual evaluation of the goodwill, residual goodwill, calculated as the difference between the price paid for the combination and the value of the acquired firm, which is its market value six days before the first communication concerning the combination.

Thus, in brief, the values that allow the breakdown are the following ones:

- A: the net accounting value of the acquired firm equity;
- B: the value (price paid);
- C: the equity value expressed at current value;
- D: the so-called write-up, which is the difference between C and A;
- E: the value of goodwill achievable through the business combination, computable as the difference between B and C.

Given a combination value (B) equal to 100 per cent, it would achieve the following values (Henning et al. 2000):

- accounting equity value = 31.4%
- equity capital expressed at current value equal to 44.5% with a surplus value (A–C) equal to 13.5%
- goodwill value equal to 55.5%, composed of the following elements:
  - going-concern goodwill equal to 11.6%
  - synergy goodwill equal to 26.9%
  - residual goodwill equal to 16.9%

DIFFERENT NOTIONS ABOUT THE ECONOMIC MEANING OF THE GOODWILL IN THE BUSINESS COMBINATION

Now it is possible to underline some considerations about the economic meaning of the goodwill, in its different accounting conceptions, most of all in the light of the introduction of the full goodwill. The main objective of the full goodwill consists of extending to all the business combinations the acquisition method: this means recording the total fair value of the acquired firm at the acquisition date, even if the acquirer acquires less than 100 per cent of the firm's capital share and even if the acquisition is realized through successive steps. The application of the full goodwill should improve the economic significance of the financial statement information and should solve some ambiguities, like the ones concerning the accounting record of shares acquired after having obtained control. More generally, the different ways of recording goodwill change according to the different underlying accounting conceptions (Ding et al. 2007). In brief, it is possible to identify three different visions.

1. The goodwill is not an asset. It is only the higher value paid by the acquirer for the acquisition of the economic assets of the acquired firm. Coherently, the value of the goodwill has to be deducted from the equity capital of the acquirer.
2. The goodwill is a part of the investment made by the acquirer to achieve the control of the target firm. In this case goodwill has to be represented in the consolidated financial statement of the acquirer as the difference between the price paid for the achievement of control and the fair value pro quota of the economic assets acquired.
3. The goodwill is a generic asset. Its value depends on many variables but it is first of all traceable to the strategic asset of the acquired firm, regardless of the extent of the capital share through which the acquirer achieves the control. In this case the accounting system tends to represent the goodwill as a full goodwill.

IMPAIRMENT TEST ON GOODWILL

The recent introduction of the full goodwill accounting method has important impacts also on the impairment test process. For simplicity's sake, this section will deal just with the IAS/IFRS. The impairment test consists of a periodic assessment of the assets' value, on the basis of the accounting standard IAS 36, according to which physical and intangible assets have to be recorded in the financial statement at a value that cannot be higher than their recoverable value, equal to the higher of the asset's sale price and its value in use. The net sale price is defined as the amount achievable from the sale of the asset after the sale costs, in a transaction between acknowledged

and available parts. The value in use, instead, is defined as the actual value of the future financial flows expected from the usage of asset and the final sale of it. The accounting standard is applied to all the assets,[2] but for the intangibles with an indefinite life the impairment test has to be executed at least once a year. The goodwill impairment test requires the horizontal breakdown of the goodwill. In fact, goodwill generates benefits through the synergy with other assets, so for the purpose of the impairment test it has to be allocated to the CGU (Cash Generating Unit), namely to the organization's subsystems composed of the smallest number of activities that generates cash flows independently from the cash flows generated by other assets or groups of assets. The goodwill's evaluation for the purpose of the impairment test takes place through the evaluation of the CGU in which it has been completely or in part allocated. Thus, in this case the accounting value of the CGU cannot exceed its recoverable value. In the case in which the accounting value of the CGU exceeds it, the decrease in value is completely attributed to the goodwill. In the case in which this allocation is not sufficient to cover the decrease in value, the residual part is attributed to the CGU's activities, proportional to their accounting value.

As regards the solutions to be adopted in the evaluation process, let us refer to Chapter 5, focused on the intangible assets evaluation. Instead, we see how the impairment test is developed according to two different accounting treatments, the purchased method and the acquisition method. In the first case, the goodwill value was equal to 20. Let us assume that this value is entirely assigned to the subsidiary acquired (which constitutes a CGU). The value of 20 is not a full goodwill, but it is a goodwill related just to the acquisition of the majority, in this case equal to 60 per cent. So, in trying to evaluate the CGU acquired, a problem emerges: in fact the CGU is evaluated as a whole (fair value as a whole), whereas the goodwill subjected to the impairment is concerning only the majority interest (60 per cent). This implies a grossing up of the goodwill value. The accounting value of the CGU as a whole, to be compared with the relative recoverable value, will be, in fact, equal to 213.3, articulated as follows (see IFRS 3 IE65):

- carrying amount of net identifiable assets, 180 (200 reduced, for example, for an amortization value equal to 20);
- carrying amount of goodwill of subsidiary, 20;
- unrecognised minorities' non controlling interest 13.3, not recorded in the financial statement (obtained with the traditional technique of the grossing up, that is, $0.4 \times \frac{20}{0.6} = 13.3$);
- notionally adjusted carrying amount of goodwill (grossed up), 33.3.

If the recoverable value of the CGU was, for example, equal to 195, in absence of the goodwill adjustment, the loss of value would be equal to 5 (195–200). Actually, the decrease of value is higher, equal to 18.3 (195–213.3). Since the goodwill is recognized only for the measure of 60 per cent,

the parent company will recognize only the 60 per cent of the goodwill impairment loss: the impairment loss will be assigned for a value equal to 11 (60 per cent of 18.3) to the goodwill recorded in the financial statement and for the remaining value equal to 7.3 to the minorities' goodwill (not recorded in the financial statement). It is clear that the grossing-up technique implies the possibility of attributing to minorities a goodwill value that includes also the control premium: that means, ultimately, overestimating the accounting goodwill value. Adopting the full goodwill option, the process is different. The accounting goodwill attributed to the subsidiary CGU is equal to 30 (that is, 20 majority goodwill and 10 minority goodwill). The accounting value of the CGU is equal to 210 (180 + 30). With a recoverable value of the CGU equal to 195, the reduction of value is equal to 15 (195–210): this loss is attributed for a value of 9 (60 per cent of 15) to the majority goodwill and for a value of (6) to the minority goodwill.

IN BRIEF

In this chapter some introductory concepts have been discussed. In particular the chapter:

- has defined the economic nature of goodwill;
- has analyzed the link between goodwill and objective function of the firm and between goodwill and intangible resources;
- has described the international accounting standards' main principles for the accounting record of the goodwill emerging in a business combination.

2 The Valuation of the Internally Generated Goodwill and Its Breakdown

FROM A GENERAL FORMULA TO THE OPERATIONAL METHODS

In Chapter 1, we used a very generic and extremely simplified formulation of the going-concern goodwill (also referred to as internally generated goodwill):

$$G = [\frac{I - (ke \times B)}{ke}] \qquad [1.1]$$

G: goodwill
I: perpetual expected earning flows
ke: cost of equity
B: equity book value
$I - (ke \times B)$: abnormal earnings

Such formulation proved useful to explain, from a theoretical perspective, the economic meaning of goodwill. Incidentally, it should be noted that the rate used in the formula (ke) is the same in both numerator and denominator. Alternative solutions have also been proposed by the specialized literature, which are:

- a rate with a higher denominator, since it must discount the high risk to which profit is subject;
- a rate with a risk-free denominator, possibly with a higher value for the generic risk of the equity investment, in order not to duplicate the weight of the specific enterprise risks (in the numerator and denominator) in determining the value.

The most theoretically correct choice consists of using the same rate in both the numerator and denominator, since in both cases it represents a fair minimal return on the capital invested in the enterprise core activity. This type of approach is the one that will be adopted in this contribution.

Shifting now the analysis towards the operational aspects of goodwill calculation, expression [1.1] should be developed and analyzed from several standpoints. In particular, this chapter will cover three relevant issues regarding the operational calculation of goodwill.

1. Preliminarily, it is necessary to go from the generic formula [1.1] to a more operational formulation, especially with reference to the usable value flow (the numerator). In this regard, it is worth understanding the nature of the relation existing between the Residual Income Model (RIM), used to calculate goodwill, and the more widespread Dividend Discounted Model (DDM), largely used in finance to determine the stock price.
2. Subsequently, a few considerations on the type of rates usable in the calculation of goodwill will be illustrated, and in particular on the ke (cost of equity) rate and on the relevance borne by the financial structure of the enterprise in influencing the cost of capital.
3. Finally, the differences between the calculation of goodwill using an equity side and an asset side logic will be explained.

Moreover, in this chapter the first breakdown schemes will be suggested concerning, in particular:

- the tax shield value (value of tax benefits);
- the real and terminal value;
- the current and growth value.

THE EARNINGS FLOWS IN THE DETERMINATION OF GOODWILL: RESIDUAL INCOME MODEL (RIM) AND DIVIDEND DISCOUNTED MODEL (DDM)

The relations between earnings, book value and enterprise value have been widely analyzed. Such analysis has led to the elaboration of the Residual Income Model (RIM), recently formalized by Ohlson (1991, 1995) and by Feltham and Ohlson (1995), whose origins however trace back to the work of Preinreich (1938), Edwards and Bell (1961) and Peasnell (1981, 1982). The Residual Income Model belongs to the family of excess return models, that is to say, to the models in which the resulting flow is broken down into a normal flow and an excess return flow (abnormal flow): so, for example, the expected cash flow of an enterprise is broken down into normal return cash flow and excess return cash flow (Damoradan 2006). The various evaluative models proposed in the professional sector, such as EVA™ (Economic Value Added), EP™ (Economic Profit), SVA™ (Share Value Added) and CFROI™ (Cash Flow Return on Investment), despite their peculiar characteristics, can all be related, on a more theoretical level, to the Excess

Return Model. In recent years, in corporate finance there has been a shift toward Excess Return Models, because of their efficiency in expressing the value creation capability of an enterprise. This issue is relevant for the purpose of this contribution, since the direct calculation of the goodwill value through capitalization of abnormal earnings is based, from a methodological standpoint, on the Residual Income Model. According to this model, in fact, the equity market value can be broken down into two components:

- book value and
- goodwill, resulting from discounting the future flow of abnormal earnings.

With the Residual Income Model, generic formulation [1.1] is expressed from an operational standpoint. In fact, component I (perpetual expected earnings flows) is replaced by net income (x) expected in future accounting periods (s), thus obtaining the following new expression:

$$G_0 = \sum_{s=1}^{\infty} \frac{[x_s - (ke \times B_{s-1})]}{(1+ke)^s} \qquad [2.1]$$

where:

G_0: goodwill in period 0;
x_s : net income in accounting period s;
ke : cost of equity;
B_s : equity book value at end of period s;
B_{s-1} : equity book value at end of period s–1;
$x_s - (ke \times B_{s-1})$: abnormal earnings in period s.

Moreover, considering what has been stated in Chapter 1, expression [2.1] may also be expressed using the ROE (Return on Equity) ratio, that is:

$$G_0 = \sum_{s=1}^{\infty} \frac{[(ROE_s - ke) \times B_{s-1})]}{(1+ke)^s} \qquad [2.2]$$

where now $ROE_s = \dfrac{x_s}{B_{s-1}}$

At time 0, market equity value (VME_0) will be equal to the sum of the equity book value at time 0 (B_0) and goodwill (G_0).

$$VME_0 = B_0 + G_0$$

Therefore:

$$VME_0 = B_0 + \sum_{s=1}^{\infty} \frac{[x_s - (ke \times B_{s-1})]}{(1+ke)^s} \qquad [2.3]$$

Under specific conditions the market equity value determined through DCF (Discounted Cash Flow) is equal to the value determined through the excess return method. Applying the RIM methodology, this demonstration requires that the Clean Surplus Relation (CSR) is assumed, according to which any variation in the book value of equity is equal to the difference between accounting earnings and dividends. Therefore:

$$B_s - B_{s-1} = x_s - d_s$$

where d_s is the dividend paid in the s period.
In this way, the dividends are broadly defined as the difference between the book profit and the variation in the book value and include not only conventional cash dividends but also other forms of cash payouts (in particular, share repurchases).

$$d_s = x_s - (B_s - B_{s-1}) \qquad [2.4]$$

Everybody knows that the determination of the equity market value (VME) using the RIM coincides with the same value calculated using the DDM, the oldest variant of discounted cash flow models,[1] provided that the Clean Surplus Relation is observed. In fact, according to the DDM, VME_0 is equal to:

$$VME_0 = \sum_{s=1}^{\infty} \frac{d_s}{(1+ke)^s} \qquad [2.5]$$

that is, applying the Clean Surplus Relation:

$$VME_0 = \sum_{s=1}^{\infty} \frac{[x_s - (B_s - B_{s-1})]}{(1+ke)^s}$$

$$VME_0 = \sum_{s=1}^{\infty} \frac{x_s}{(1+ke)^s} - \sum_{s=1}^{\infty} \frac{B_s}{(1+ke)^s} + \sum_{s=1}^{\infty} \frac{B_{s-1}}{(1+ke)^s}$$

By adding and subtracting value B_0 in the second part of the equation, the following expression can be obtained:

$$VME_0 = B_0 + \sum_{s=1}^{\infty} \frac{x_s}{(1+ke)^s} - \sum_{s=0}^{\infty} \frac{B_s}{(1+ke)^s} + \sum_{s=1}^{\infty} \frac{B_{s-1}}{(1+ke)^s}$$

Finally, developing this last expression, we can obtain the same formula for equity valuation at time 0 provided by the Residual Income Model.[2]

$$\mathrm{VME}_0 = \mathrm{B}_0 + \sum_{s=1}^{\infty} \frac{[x_s - (ke \times B_{s-1})]}{(1+ke)^s} \qquad [2.3]$$

The trend in literature that emphasizes the advantages of RIM, as opposed to the alternative offered by the DDM (Jiang & Lee 2005), in determining the equity market value of an enterprise, is fairly widespread now. However, this is not the specific point of interest of this contribution. We care instead to relate RIM to the calculation of the goodwill value and demonstrate that, at least on certain conditions, the equity market value calculated using the RIM (and, therefore, the goodwill) coincides with the value obtained with the expected present value of future dividends.

COST OF CAPITAL

So far, for the purpose of goodwill evaluation, a generic ke rate has been used. The measurement of the selected rate in this type of evaluation significantly affects the entire valuation process. It is therefore necessary to make some clarifications, of both a conceptual and operational kind. As a general rule, the rate includes both the effect of time and, more importantly, the effect of the risk of the economic initiative, on the value (according to the Risk Adjusted Discount Rate [RADR] logic). A strong relationship exists between the risk measure and opportunity cost of capital. The opportunity cost of any resource employed for economic production corresponds in fact to the minimum price required by the supplier of that resource to undertake or continue the transaction (Castanias & Helfat 1991, Charreuaux & Desbrières 2001, Milgrom & Roberts 1992). Hence, the opportunity cost of capital depends on the return expected by the underwriters of the financial liabilities of the enterprise. Such expectations develop based upon the risk being taken (hence, the relation between the cost of capital and risk). Since underwriting of liabilities may occur in different ways, it is necessary to make a distinction between:

- cost of equity (ke);
- cost of debt (kd);
- cost of the entire invested capital (Weighted Average Capital Cost [WACC]).

The cost of the entire invested capital (WACC) depends on the weighted mean of rates ke and kd, that is, without taxation:

$$\text{WACC} = \text{ke}\frac{E}{E+D} + \text{kd}\frac{D}{E+D} \qquad [2.6]$$

ke : cost of equity
E : market value of equity (previously defined as VME)
D : market value of debt
kd : cost of debt

It should be considered that in determining the weight of the equity (E) and the weight of the debt (D) it is necessary to refer to market values and not to book values. Indeed, the very concept of return which the rate is based on implies that investors compare the expected results with the equity or debt, whose value should be measured based upon the disbursement actually necessary to acquire it (namely, the market value). Only for the sake of simplicity, E and D book values can be sometimes assumed to be equal to the market value. Having clarified these preliminary aspects, it is now possible to focus the attention on two particularly relevant issues, which are:

- the methods for determining the cost of equity (ke);
- the relation between cost of capital and the financial structure of the enterprise.

MEASURE OF THE KE RATE, COST OF EQUITY

Possible methods to determine the equity cost of an enterprise (ke) can be divided into qualitative and quantitative methods. Qualitative approaches consist of a logical analytical process that cannot be expressed by a mathematical algorithm. Such logical process may include for instance the following steps:

- relevant information for the enterprise (market, competitors, demand trend, production and distribution efficiency, etc.);
- relevant information for comparable enterprises;
- rates to be possibly used for transactions concerning comparable enterprises;
- rates to be applied on average for similar transactions executed in the strategic business area;
- rate finally selected.

In practice, the large group of quantitative methods is usually preferred, even though these, apart from affording an apparent formal elegance, do not necessarily prove to be well-grounded on a substantial level.

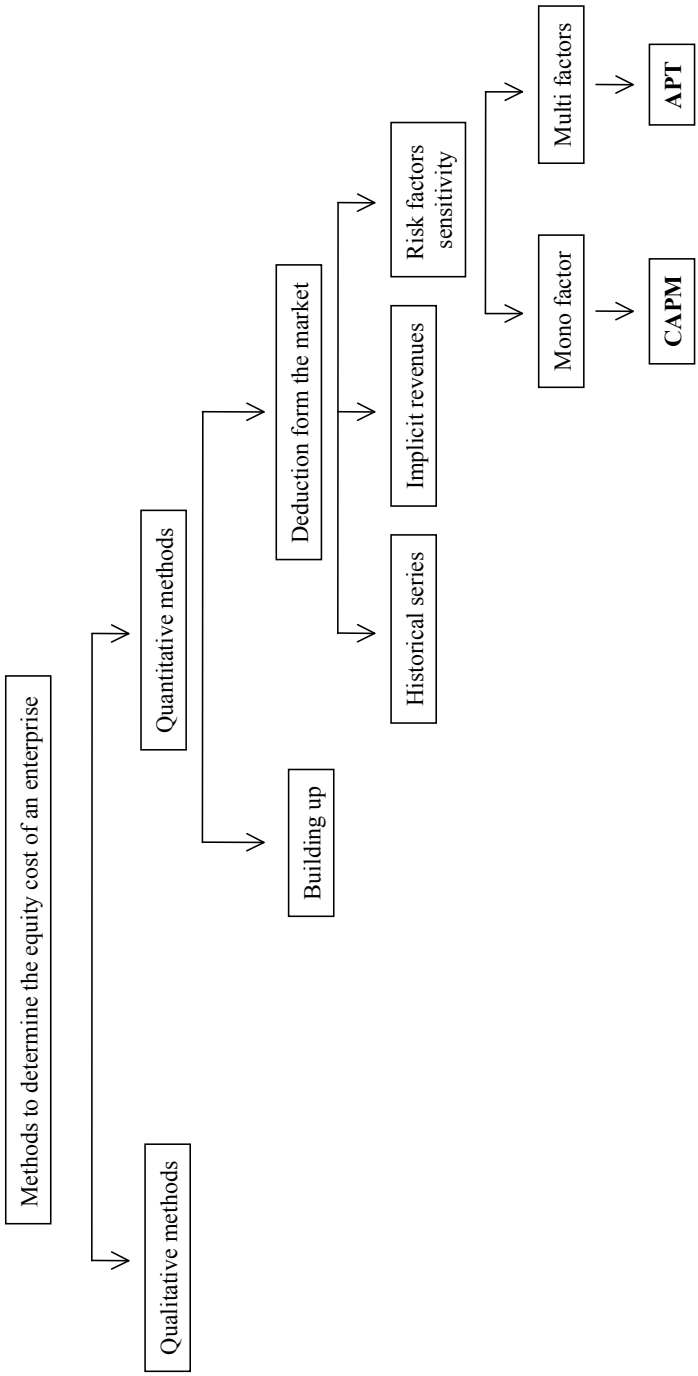

Figure 2.1 Equity cost.

As a start, it is possible to make a distinction between quantitative approaches based on a construction by factors (building up) and approaches based on deductions from the market. According to the first one (building up), the risk level is "built" by consecutive stages, each of which identifies a specific risk increase. Therefore, starting for example from the risk-free rate and from the increase due to the share risk, it is possible to obtain other possible increases due to specific factors. Some of these may include for example:

- a strategic area factor, which may increase or reduce the overall risk level;
- a dimensional factor, which increases the risk attributable to small enterprises;
- a start-up factor, which increases the risk of enterprises at a start-up stage;
- a financial factor, which includes leverage and other aspects connected to the financial structure of the enterprise;
- a diversification factor, which, as it increases, might reduce the enterprise risk.

The most used quantitative methods are based on deductions from the market and can also be classified into several groups:

- time series of past yields (stock market yields or accounting returns);
- yields implicit in current stock exchange prices (Dividend Discount Model or P/E Model);
- models based on the sensitivity of the enterprise to one or more risk factors, respectively called single-factor (Capital Asset Pricing Model [CAPM]) or multi-factor (Arbitrage Pricing Theory [APT]) models.

Much specialized literature has been produced on the latter, and readers are invited to refer to it. Only a few concepts useful for our purpose are given below. CAPM is certainly the best known and most widely used deductive approach. Using CAPM, the assumption is made that investors may diversify their portfolio and therefore diversify a portion of the undertaken risk (diversifiable or non-systematic risk). Only the component that cannot be neutralized through diversification (non-diversifiable or systematic risk) must indeed be compensated and therefore taken into consideration for the purpose of estimating the rate. Such component depends on decisive risk factors which are not specific of single economic activities and are instead common to several activities and therefore non-diversifiable. Obviously, the effect of such factors on each single enterprise varies in relation to their sensitivity level. In other words, systematic risk does not equally burden the shares of all enterprises, but only to a different extent, according to the sensitivity and the way each enterprise reacts

to the events that affect the entire stock market. Having said that, the rate can be conceptually calculated using CAPM as follows:

$$ke = Rf + \beta\,(Rm - Rf) \qquad [2.7]$$

- ke : cost of equity;
- Rf : return on risk-free shares (risk-free rate);
- Rm : general average yield of stock market, i.e., a portfolio comprising all risk-bearing shares, obtained from the arithmetic mean of share yields. The difference between Rm and Rf therefore measures the premium per risk unit (Rp) in relation to the overall stock market;
- β: correlation coefficient between the actual yield of the share of the enterprise being analyzed and the overall yield of the reference market. β measures the sensitivity of the share of the enterprise being studied through volatility of its yield compared to that of the market. It is obvious that $\beta > 1$ indicates a systematic risk greater than the general market risk, while $\beta < 1$ indicates the opposite situation. According to standard practice, the so-called industry specific β's are largely used, that is, average β's calculated on a sample of enterprises operating in the same industry.

The non-diversifiable systematic risk of an enterprise is obtained therefore from the sensitivity of the return on its share in relation to the variability of the market portfolio yield. Such sensitivity is measured by β, which, at least on a conceptual level, depends on the three following variables (Damoradan 2006).

1. The type of activity of the enterprise. The more the activities of the enterprise are sensitive to the overall trend of the economy—and therefore the more they vary as it varies—the higher beta will be. For instance, enterprises carrying out cyclic activities may score beta values that are higher than those of enterprises carrying out activities that are substantially non-cycle dependent.
2. Intensity of operational lever, defined as the ratio between fixed costs and total costs. Enterprises with high fixed costs, all things being equal, show greater variability in the EBIT compared to enterprises with a more contained operational lever, and therefore a higher beta.
3. Intensity of financial lever. As better described further down, a high level of indebtedness (high financial lever) implies a higher beta, since the variability of the enterprise's net income increases. In this regard, levered (in case of indebtedness) β values and unlevered (in case of non-indebtedness) are used. The operational methods to shift from levered to unlevered β (and vice versa) will be described in the following section.

The most used method for the operational calculation of β is a top-down method; i.e., the share yield is related to market yield (using the simple regression technique—raw β), usually on the basis of sixty observations (five years). There is also an alternative method to obtaining the β value of a multi-business enterprise, which is particularly relevant for our purpose. The method is based on a bottom-up approach and includes the following five distinct phases:

1. identification of the various activities carried out by the enterprise (which actually may have very different risk profiles);
2. estimate of the unlevered β for each activity, using industry-specific unlevered β's;
3. estimate of the unlevered β of the enterprise as a weighted average of the beta values calculated for each activity: depending on the case at hand, weighing can be based on revenues, operating profit or the value that can be associated with each activity;
4. calculation of the indebtedness index of the enterprise, using the market value of both debt and equity (see what has been explained with regard to WACC);
5. determination of the levered β of the enterprise using the unlevered β and the indebtedness index (see next section for the calculation).

Among the methods that are based on sensitivity to risk factors, CAPM is not the only one that can be used to determine the rate. In particular, the more complex Arbitrage Pricing Theory (APT) is conceptually incorporated in CAPM. APT does not focus on one single common risk factor, that is, the course of the stock market, but extends the analysis to several common factors (multi-factor analysis), such as the index of industrial production, long-term inflation, default risk, etc. APT can be represented in the following way:

$$ke = Rf + \beta 1[E(f1) - Rf] + \ldots\ldots \beta n[E(fn) - Rn] \qquad [2.8]$$

where E(Fn) is the expected return in relation to risk factor n only, while n measures the specific sensitivity of the examined activity in relation to the specific risk factor n. Even though this approach is more correct on a theoretical level, difficulty applying it strongly limits its use in standard practice.

COST OF CAPITAL AND FINANCIAL LEVERAGE

A further relevant aspect when determining the cost of capital is the relationship between the level of indebtedness (financial leverage) and the ke and WACC rates. First of all, it is necessary to clarify the nature of the

relation that exists between the risk and the financial lever effect, which in case of no fiscal interference can be expressed as follows:[3]

$$\text{ROE} = ROI + (ROI - kd)\frac{D}{E} \qquad [2.9]$$

D: debt
E: equity
ROE: Return on Equity, equal to $\frac{I}{B}$, where I is net income;[4]
ROI: Return on Investment, equal to $\frac{IO}{D+E}$, where IO is the operating profit and D + E: total invested capital (assuming, exactly, that no surplus assets exist);
kd: cost of debt.

From relation [2.9], it emerges that the leverage $\frac{D}{E}$ generates greater potential variability of Return on Equity (ROE) and therefore greater risk. Based on this consideration, ke rate is divided into:

- keU, i.e., cost of unlevered equity (without debt) and
- keL, cost of equity with debt (levered).

The relation between keL and keU can be obtained from the value conservation law, according to which, in case of no fiscal interference, the value of an enterprise exclusively depends on the operating flows that it is able to generate, irrespective of the relation existing between indebtedness and risk capital (Williams 1938, Modigliani & Miller 1958). Based on this hypothesis, the WACC rate naturally corresponds to the keU rate, that is:

- the weighted average capital cost does not vary based on indebtedness;
- the weighted average capital cost corresponds to the return required by the shareholders where an enterprise is financed only by risk capital.

The previous formula defining WACC can therefore be perfected in the following way:

$$\text{keU} = \text{WACC} = \text{keL}\frac{E}{E+D} + \text{kd}\frac{D}{E+D}$$

therefore:

$$\text{keL} = keU + [keU - kd]\frac{D}{E} \qquad [2.10]$$

Basically, the measure of the keL rate depends on:

- keU;
- spread between keU and kd;

- $\frac{D}{E}$

A parallel between this formula and that which was previously used to define the financial level (ROE and ROI) is well apparent. It is clear that while ROE and ROI are indexes of an enterprise profitability, keL and keU are the rates of return expected from the investors. The nature of the variables therefore is different.

However, based on a comparison between the formulas, it is possible to understand an essential element of the value conservation law; i.e., the increase in profitability attributable to the leverage (increased ROE) is theoretically balanced by an increase in the return required by the investors, measured by keL, following an increase in the risk of the initiative. Also the tax element affects the relation between the level of indebtedness of an enterprise and the cost of capital. In case of an unlevered structure, fiscal interference simply manifests itself as a reduction in profit flows, which can also be obtained through a rate adjustment. In this perspective it is particularly important to clarify what is a pre-tax rate and a post-tax rate and the relations they should have with the flows. The pre-tax rate is a gross rate, it includes the fiscal cost and, hence, it results higher than a post-tax rate. With t equal to the tax rate, the relationship between the two rates is the following one:

$$\text{pre-tax rate} = \text{post-tax rate}\ \frac{1}{(1-t)}$$

So, the pre-tax rate is a post-tax rate grossed up by a standard rate of tax. Naturally, the rate chosen, pre- or post-tax, has to be coherent with the flows that it has to discount: so the pre-tax rate, since it embodies the fiscal cost, has to be used for pre-tax flows discounting (before tax); on the contrary, the post-tax rate has to be used for net flows discounting (after tax). A numerical example can help clarify how it is possible to obtain the same result using the two methods.

- Unlevered flow before tax and financial cost = 20.
- Tax rate (t) = 40%.
- Capitalization rate keU = 10%.

The post-tax rate is equal to 10 per cent, whereas the pre-tax rate is equal to 16.666 per cent ($\frac{0.1}{1-0.4}$). The pre-tax flow is equal to 20 whereas the post-tax flow is equal to 12 (20 x 0.6). The post-tax flow (net flow) has to be discounted at a post-tax rate, as follows:

$$\frac{20\times(1-0.4)}{0.10}=\frac{12}{0.1}=120$$

The pre-tax flow (gross flow) has to be discounted at a pre-tax rate

$$\frac{20}{0.10 \times \frac{1}{1-0.4}} = \frac{20}{0.1666666} = 120$$

The analysis however becomes more complex in case of financial debt. The equality of the two techniques, mentioned above, is broken because of the tax shield presence. In fact, unlike the dividends distributed to the shareholders, interest expenses paying off the debt are tax deductible. In case of financial debt, therefore, benefits can be obtained thanks to the so-called tax shield. Through disaggregated valuation methods, such as for example the Adjusted Present Value (APV) (Myers 1974), it is possible to highlight the value of these benefits. Using APV, in fact, the value of the assets of an enterprise is defined as the sum of the unlevered asset values and the value of the benefits that can be obtained from the tax shield:

$$\text{VAL} = \text{VAU} + \text{VTS} \qquad [2.11]$$

VAL: levered asset values of the enterprise;
VAU: unlevered asset values of the enterprise;
VTS: value of the benefits that can be obtained from the tax shield.

To calculate the VTS value of the benefits, it is necessary to break down the income flow generated in relation to the type of capital invested in it. The flow in fact can be divided in relation to debt and equity. The former, i.e., the (z) flow generated by the debt, is supposedly equal to:

$$z = kd \times D \qquad [2.12]$$

where D is the debt and kd its cost.
The latter (x), generated by the equity, is instead equal to:

$$x = (IO - kd \times D) \times (1 - t) \qquad [2.13]$$

where IO is equal to the operating result and t equal to the tax rate. The total flow of the enterprise assets is clearly equal to the sum of x and z flows.

$$\text{Flow generated by the assets} = kd \times D + (IO - kd \times D) \times (1 - t)$$

Therefore, developing and aggregating, the flow generated by the assets can be expressed as follows:

$$\text{Flow generated by the assets} = IO \times (1 - t) + kd \times D \times t \qquad [2.14]$$

Based on [2.14], it is clear that due to the fact that interest expenses are tax deductible, the flow generated by the assets increases by the kd x D x t value. The discounted value of the tax shield can therefore be expressed as (Fernandez 2004, Cooper & Nyborg 2006):[5]

$$VTS = \sum_{s=1}^{\infty} \frac{kd \times D_s \times t}{(1+kd)^s} \qquad [2.15]$$

and, in case of an unlimited time period, as:

$$VTS = \frac{kd \times D \times t}{kd} = D \times t \qquad [2.16]$$

Where disaggregated valuation methods such as the Adjusted Present Value (APV) are not used, then the fiscal benefits are included in the rate, according to the following logic:

$$ke^{*}L = keU + [keU - kd](1-t)\frac{D}{E} \qquad [2.17]$$

$$WACC^{*} = ke^{*}L\frac{E}{E+D} + kd(1-t)\frac{D}{E+D} \qquad [2.18]$$

Finally, when determining the β values, the financial structure and the related risk should be kept into account. As previously stated in the section titled Measure of the ke Rate, Cost of Equity, the β values calculated based upon market data incorporate both the operating risk and the financial risk. This means that when an average β value of a representative sample is used, such β value should be adjusted to reflect the specific leverage of the enterprise being evaluated. Adjustment requires two operations:

1. neutralization of the leverage effect on the β value drawn from the market (unlevering);
2. subsequent adjustment to keep into account the financial structure of the valuated enterprise (relevering).

The entire process is based on the following relation, which keeps into account the tax benefits:

$$\beta L = \beta U + \beta U(1-t)]\frac{D}{E}$$

$$\beta L = \beta U[1 + (1-t)]\frac{D}{E}] \qquad [2.19]$$

where D and E are, respectively, debt and equity.[6]
βL: β of an enterprise with a given $\frac{D}{E}$ leverage;

βU: β unlevered, in case of no indebtedness;
t: tax rate.

Once the relation has been set, the first step consists of shifting from a levered β value of the sample to a β operating value:[7]

$$\beta U = \frac{\beta L}{[1+(1-t)\frac{D}{E}]} \qquad [2.20]$$

The second step (relevering), which allows to obtain a relevered β(RL) value, consists of applying the specific $\frac{D}{E}$ relation and the specific t value of the enterprise being valuated to the β (U) value of the sample, obviously using the previously introduced general expression:

$$\beta RL = \beta U + \beta U (1 - t) \frac{D}{E} \qquad [2.21]$$

ASSET SIDE AND EQUITY SIDE LOGICS FOR ENTERPRISE VALUATIONS

Financial theory has defined two approaches in the application of the general valuation formula of an enterprise: the equity side (or equity model) valuation and the asset side (or entity model) valuation, which originates Enterprise Value (EV). In the first instance (equity side) it is the economic value of equity to be directly estimated, while in the second instance (asset side) the entire invested operating capital is being valuated (namely, the assets), from which later the market value of the financial debts is deducted, thus obtaining the equity market value. To clarify the meaning of such distinction, Figure 2.2 shows a financial reclassification of the assets of the enterprise, through which it is possible to highlight the two elements of the valuation (operating assets and equity).

Capital investments basically correspond to the operating net invested capital, which in turn is composed of net operating assets (tangible, intangible and financial) and trade working capital (trade receivables less trade payables plus inventory value). This capital is to be used for operating purposes, and it is therefore different from other activities, i.e., those investments that might be alienated without any direct consequence on the operating results. Among these, equity investments in other companies (except when an operating role is attributed to them) or investment properties not intended for the core activity of the enterprise are usually included. On the capital source side, instead, a major distinction is to be made between net financial position, or net financial debt (financial debt less liquid assets and financial credits) and equity. The differences in the application of the two methods concern both the selected type of flow

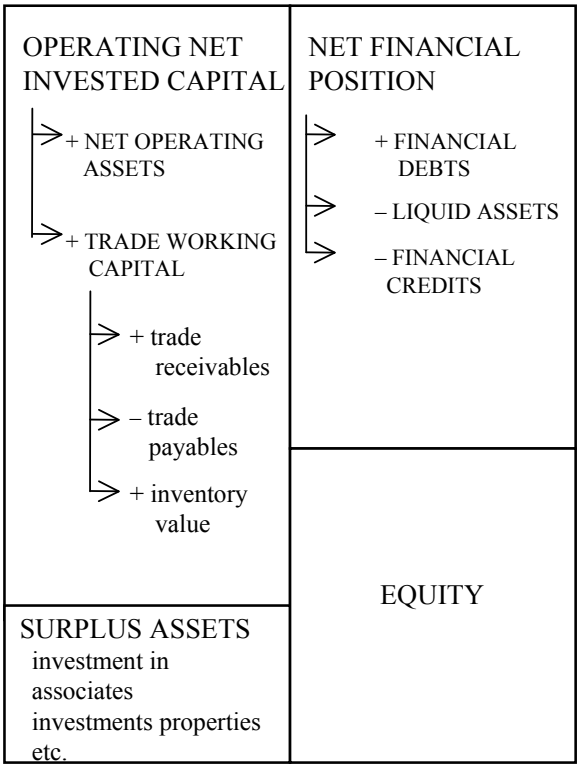

Figure 2.2 Financial reclassification of assets and liabilities (1).

and the used discount rate. Let us look at the flow first. In the equity model, the element being evaluated is the equity only and therefore the usable flow must exclude financial costs. Conversely, since the enterprise value is the value of all assets, irrespective of how these are financed (by debt or by equity), then the flow must include financial costs. Therefore, according to a cash flow logic (consistently with the most used valuation methods, such as Unlevered Discounted Cash Flow [UDCF]), in case of an asset side valuation, operating cash flows inclusive of financial costs are used (free cash flows from operation [FCFO]) while in case of equity side valuations, operating cash flows exclusive of financial costs are used (free cash flow to equity [FCFE]). To ease the analysis, two summary tables are given below for the calculation of the two types of cash flow, excluding the flows from other activities which—as we will explain further below—are valuated separately. The annual cash flow, following the asset side hypothesis, can be calculated starting from expenses and income in the following way:

Table 2.1 FCFO

(+) Income
(–) Cash operating expenses
(=) Gross operating margin
(+/–)Δ Trade working capital
(–) Operating investments
(+) Operating disinvestments
(–) Taxes on operating results
(=) FCFO

According to the equity side hypothesis, the annual cash flow can be obtained as follows:

Table 2.2 FCFE

(+) Income
(–) Cash operating expenses
(=) Gross operating margin
(+/–)Δ Trade working capital
(–) Operating investments
(+) Operating disinvestments
(–) Net interest expenses
(–) Taxes on net income
(+/–) Δ of tax fund
(+/–) Variation of net financial debt
(=) FCFE

Just as a difference in the object being valuated causes a difference in the used flow, by the same token a specific flow requires the use of the appropriate discount rate. In equity side valuations, cash flows must be discounted using a rate that only reflects the opportunity cost of the equity (that is, ke, and more precisely, keL, that is, levered). On the asset side, instead, it is the entire invested capital that is valuated. Such capital is financed by both equity and debt. For this reason, the rate must reflect the opportunity cost for all capital contributors (WACC). Therefore, considering an n period of time, in the asset and equity side approach, general formulas are, respectively, the following:

$$VME_0 = \sum_{s=1}^{\infty} \frac{FCFO_s}{(1+WACC^*)^s} - D \qquad [2.22]$$

$$VME_0 = \sum_{s=1}^{\infty} \frac{FCFE_s}{(1+ke^*L)^s} \qquad [2.23]$$

Let us remark that for both the techniques, we have used a net flow (post tax), and hence also the rate is a post-tax rate. Both methods should give the same result, provided that the financial structure is correctly represented by the selected rates (Figure 2.3).

Obviously, in the case of no financial debt, the two procedures will be a total match. It should be noted that the rates used in expressions [2.22] and [2.23] include the benefits determined by the tax shield. The selection of an aggregated valuation method is therefore implicit. Conversely, in case the APV disaggregated method is used, briefly described in the previous

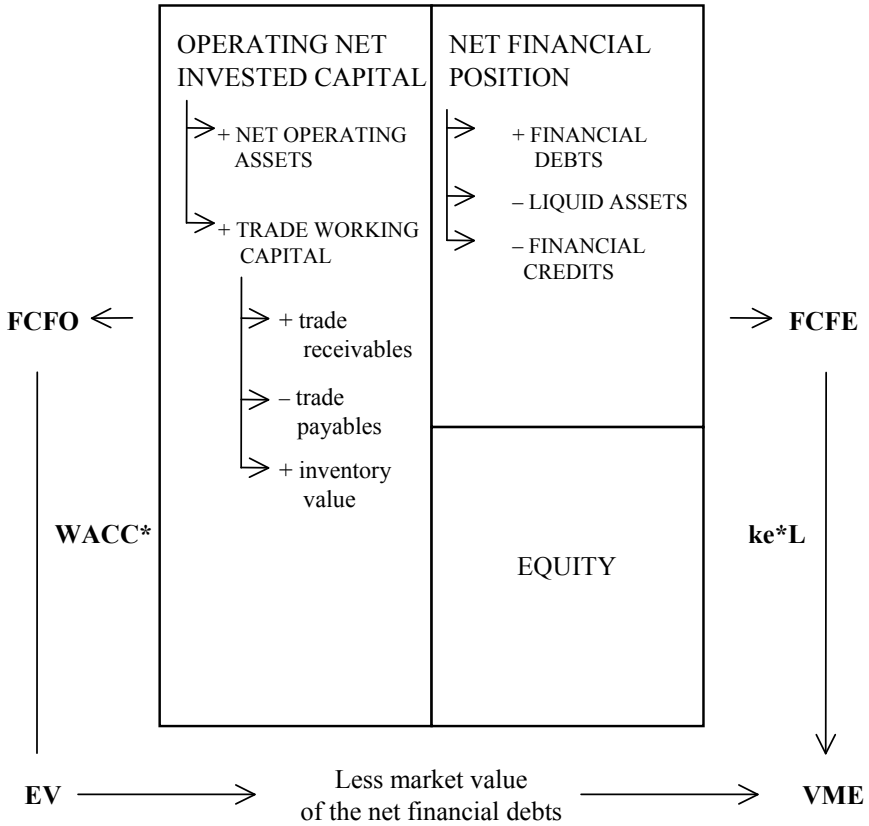

Figure 2.3 Financial reclassification of assets and liabilities (2).

section, the following formulas will be obtained, according respectively to the asset side and equity side approach:

$$\mathrm{VME}_0 = \sum_{s=1}^{\infty} \frac{FCFO_s}{(1+keU)^s} + \sum_{s=1}^{\infty} \frac{kd \times D_s \times t_c}{(1+kd)^s} - \mathrm{D} \qquad [2.24]$$

$$\mathrm{VME}_0 = \sum_{s=1}^{\infty} \frac{FCFE_s - (kd \times D_t \times t_c)}{(1+keL)^s} + \sum_{s=1}^{\infty} \frac{kd \times D_s \times t_c}{(1+kd)^s} \qquad [2.25]$$ [8]

The disaggregated approach in the equity side version is presented only for the sake of consistency, as it is never used in standard practice. Also in the disaggregated approach the flows and the rates are after tax. The distinction between asset side and equity side valuations, besides being relevant for the correctness of the procedure, also becomes meaningful from a more operational standpoint. In fact, it should be reminded that:

- the most widely used method for the valuations, the Unlevered Discounted Cash Flow, is an asset side method;
- it is possible to use both methods also to calculate the goodwill.

ASSET AND EQUITY SIDE IN GOODWILL VALUATIONS

General formulas to valuate the goodwill used so far follow equity side logics. If a calculation is developed in an equity side environment, the value of abnormal earnings is considered as excess return compared to normal average return of the equity. Reference should be made again to formulas [2.1] and [2.2] illustrated in the first part of the chapter, adjusting them according to the considerations made in the last sections, with special reference to the rates and the value of tax benefits of debt included therein.

$$\mathrm{G}_0 = \sum_{s=1}^{\infty} \frac{[x_s - (ke^* L \times B_{s-1})]}{(1+ke^* L)^s} \qquad [2.26]$$

$$\mathrm{G}_0 = \sum_{s=1}^{\infty} \frac{[ROE_s - ke^* L] \times B_{s-1}}{(1+ke^* L)^s} \qquad [2.27]$$

To evaluate the goodwill, it is also possible—and actually advisable, as better described further below—to adopt an asset side approach. In the asset side approach, excess return is calculated with reference to the operating invested capital, according to the following formulas:

$$\mathrm{G}_0 = \sum_{s=1}^{\infty} \frac{[y_s - (WACC^* \times C_{s-1})]}{(1+WACC^*)^s} \qquad [2.28]$$

as well as, similarly to [2.27]

$$G_0 = \sum_{s=1}^{\infty} \frac{[(ROI_s - WACC^*) \times C_{s-1})]}{(1+WACC^*)^s} \qquad [2.29]$$

where:

y_s: operating profit after tax in the s accounting period, i.e., operating profit multiplied by (1–t);
$WACC^*$: weighted average capital cost (incorporating the tax benefits resulting from financial debt);
C_s : operating invested capital at the end of period s: such value is equal to the sum of equity book value (B) and financial debt (D) and it is obtained through the algebraic sum of: fixed asset + current asset–current liabilities–cash (that is fixed asset + non-cash working capital);
ROI_s: return on operating invested capital, equal to $\frac{y_s}{C_{s-1}}$ [9].

It should be noted that in the equity side approach, abnormal earnings are calculated as a residual income (RI) using, alternately, the following formulas:

$$RI_s = x_s - (ke^* L \times B_{s-1}) \qquad [2.30]$$

$$RI_s = (ROE_s - ke^* L) \times B_{s-1} \qquad [2.31]$$

In the asset side approach, abnormal earnings appear instead as operating residual income (ORI), which can also be obtained from the following alternate formulas:

$$ORI = y_s - (WACC^* \times C_{s-1}) \qquad [2.32]$$

$$ORI = (ROI_s - WACC^*) \times C_{s-1} \qquad [2.33]$$

At least as far as the asset side procedure is concerned, it is possible to apply the disaggregated APV method also to calculate the goodwill. It should be reminded that the evaluation using APV consists of the following calculation:

$$VME_0 = \sum_{s=1}^{\infty} \frac{FCFO_s}{(1+keU)^s} + \sum_{s=1}^{\infty} \frac{kd \times D_s \times t_c}{(1+kd)^s} - D \qquad [2.24]$$

Applying this logic to determine the goodwill, the following formula can be obtained:

$$Gn_0 = \sum_{s=1}^{\infty} \frac{[y_s - (keU \times C_{s-1})]}{(1+keU)^s} \qquad [2.34]$$

where Gn_0 is the goodwill value after the tax benefits (net value).

In this way, the total equity value would be the result of the addition of the three addends: equity book value, goodwill value as obtained in [2.34] and the value of tax benefits automatically obtained from the [2.15] formula, that is:

$$VME_0 = B_0 + Gn_0 + VTS \qquad [2.35]$$

Let us take a closer look at this point. Since goodwill is the discounted value of future abnormal earnings, which is originated—as we will explain in the next chapter—by phenomena of a competitive kind, it might be appropriate to deduct the tax benefits of debt from the goodwill value. Such benefits, in fact, are not directly attributable to the underlying economic phenomena of the goodwill. They certainly have a value and affect the total equity value, but they should not affect the goodwill value. Moreover, this remark is part of a wider and more articulated consideration. When a set of assets is valuated, the asset side method is conceptually more appropriate. However, one should consider if it is correct that such valuation should be affected by the methods by which a set of assets—or individual asset, if we prefer—is financed. In other words, the question should be asked whether the goodwill valuation should be affected or not by the financial structure of the enterprise, as is inevitably the case when using the $WACC^*$. As a matter of fact, as the effort is made to relate the goodwill to the competitive capability of the enterprise, such value might be considered totally independent of the financial structure, that is, the way by which an enterprise finances itself. This would imply a total neutralization of the financial aspect and therefore the use, for the purpose of the valuation, of a keU rate, that is, a rate that reflects the unlevered equity cost. Or, at least in the case of a complex of assets, it would be possible to link the WACC determination to a target financial structure, that also leaves aside the real financial structure which is, often, difficult to determine. Anyway, in this work, for the purpose of goodwill evaluation, we prefer to use a disaggregated method, with a keU rate and, hence, we will refer to the Gn value rather than to the G value.

A FEW NUMERICAL EXAMPLES

To better understand the implications of the two different valuation methods of goodwill (asset side and equity side), as well as of the use of an aggregated valuation approach, a few numerical examples are now introduced. In order to make calculations easier, we will always use the perpetual rent formula. The example consists of four steps:

1. calculation of the unlevered equity value;
2. in case of debt, related determination of the ke^*L and $WACC^*$ rates and verification that the results of the asset side and equity side procedures match;

3. calculation of goodwill using an aggregated method (equity side and asset side);
4. calculation of goodwill using a disaggregated method (asset side).

Unlevered equity value

To start, let us consider an enterprise with no debt and the following basic data:

- expected operating profit in perpetuity (y) = 500;
- tax (t) = 0.4;
- net operating profit (y = x = FCFO = FCFE)[10] = 500 x (1-0.4)=300;
- keU = 0.1.

With a net operating profit expected in perpetuity equal to 300 and an unlevered rate of 10 per cent, the equity value, which is equal to the assets value, will be equal to 3,000.

$$\mathrm{VME}_0 = \frac{y}{keU} = \frac{300}{0.1} = 3{,}000$$

In case of debt, related determination of the ke*L and WACC* rates and verification that the results of the asset side and equity side procedures match

Let us assume now that debt is introduced in this simulation, in the amount of 1,000. The data of the original situation must therefore be updated accordingly, in the following way:

- expected operating profit in perpetuity (y) = 500;
- tax (t) = 0.4;
- debt (D) = 1,000;
- cost of debt kd = 0.05;
- interest expenses (0.05 x 1,000) =50;
- net income (x = FCFE) = 450 x (1-0.4) = 270.

Given the debt, it is now necessary to shift from a keU rate of 10 per cent to a ke*L rate and to a WACC* rate. In the section titled "Measure of the ke Rate, Cost of Equity," the methods have been illustrated by which it is possible to shift from keL / WACC to ke*L / WACC*, which requires a prior evaluation of the financial structure of the enterprise, that is, the relation between debt (D) and equity (E). Moreover, for the reasons mentioned above, the debt and equity values to be used to determine the rates are market and not book values.

Let us assume that the market value of the existing debt is equal to 1,000, which for the sake of simplicity is supposed to be equal to the book value. The debt of 1,000 replaces a portion of the equity which therefore, with reference to the original data (3,000), would be equal to the balance of 2,000. But, all other conditions being equal, the equity value in case of indebtedness is higher, since the benefits of the tax shield are enjoyed. Such benefits might derive from a simple formula, in perpetuity equal to:

$$\frac{kd \times D \times t}{kd} = \frac{0.05 \times 1{,}000 \times 0.4}{0.05} = 400$$

The value of the tax shield (400) is added to the market equity value, which in case of debt, becomes therefore equal to 2,400. At this point, using the already known formulas, the ke^*L and $WACC^*$ rates can be determined:

$$ke^*L = keU + [keU - kd](1-t)\frac{D}{E}$$

that is:

$$ke^*L = 0.1 + [0.1 - 0.05] \times (1 - 0.4) \times \frac{1{,}000}{2{,}400} = 0.1125$$

$$WACC^* = ke^*L\frac{E}{E+D} + kd(1-t)\frac{D}{E+D}$$

that is:

$$WACC^* = 0.1125 \times \frac{2{,}400}{3{,}400} + 0.05(1-0.4) \times \frac{1{,}000}{3{,}400} = 0.08823$$

With ke^*L and $WACC^*$ rates respectively equal to 11.25 per cent and 8.82 per cent, it is possible to verify that the equity market values—which we know is equal to 2,400—calculated using both an asset side logic and an equity side logic, actually match. In fact, in the asset side logic:

$$\text{VME}_0 = \frac{FCFO}{WACC^*} - D = \frac{300}{0.08823} - 1{,}000 = 3{,}400 - 1{,}000 = 2{,}400$$

in the equity side logic:

$$\text{VME}_0 = \frac{FCFE}{keL^*} = \frac{270}{0.1125} = 2{,}400$$

Calculating the goodwill using the aggregated method

In case of debt, the equity market value is equal to 2,400 while the total asset value is equal to 3,400. To determine now the goodwill value, it is necessary to introduce one last piece of input information regarding the equity book value, which must necessarily be different from and lower than the market value if one wishes to obtain a goodwill. Let us assume therefore that the book value is equal to 1,500, and that consequently the goodwill value, indirectly or differentially calculated, is equal to 900 (2,400–1,500). It is also possible to obtain a goodwill value of 900 directly, alternately discounting the operating abnormal earnings (ORI) and net abnormal earnings (RI). In the first case, keeping in mind that the book value of the invested capital is equal to 1,500 + 1,000 (= 2,500):

$$G_0 = \sum_{s=1}^{\infty} \frac{[y_s - (WACC^* \times C_{s-1})]}{(1+WACC^*)^s} = \frac{300-(0.08823 \times 2{,}500)}{0.08823} = \frac{79.4}{0.08823} = 900$$

in the second case:

$$G_0 = \sum_{s=1}^{\infty} \frac{[x_s - (ke^*(L) \times B_{s-1})]}{[1+ke^*(L)]^s} = \frac{270-(0.1125 \times 1{,}500)}{0.1125} = \frac{101.25}{0.1125} = 900$$

Calculating the goodwill using the disaggregated method

As explained in the section titled "A Few Numerical Examples," the tax shield value (D × t = 1,000 × 0.4 = 400) is included in the goodwill value of 900, since it is included in the equity market value, which is equal to 2,400. It is included even if it is directly calculated, given that the benefits of the tax shield are included in the value of the used rates. When it is excluded from the equity value, the goodwill value naturally decreases to 500. This result can be also directly obtained, calculating the goodwill using a disaggregated method, which basically consists of using the keU rate, which, in case of no tax benefits induced by the debt, is equal to the WACC rate. In fact, given that [2.34]:

- operating profit after tax = 300;
- unlevered risk capital cost keU, = 0.1;
- invested capital (book value) = 2,500.

$$Gn_0 = \frac{300 - 0.1 \times (2{,}500)}{0.1} = 500$$

Using the disaggregated method, the equity value, which remains equal to 2,400, is divided into three components: book value (B_0), net goodwill (Gn_0), tax benefits (VTS).

$$VME_0 = B_0 + Gn_0 + VTS$$

$$2{,}400 = 1{,}500 + 500 + 400$$

It should be noted that it is not possible to obtain a goodwill value of 500 when the net income and not the net operating profit is used (in the numerical example, equal to 270). This is due to the fact that the value of 270 already fully includes the tax benefit of the debt, which we have seen to be equal to a flow of 20. On the other hand, the net income is a summary expression of the economic result reached by the enterprise.

EQUITY VALUE AND GOODWILL VALUE

Based on the analysis described above, it is fair to come to this first conclusion: in order to directly determine the value of the going-concern goodwill of a given enterprise, it is more appropriate to use a disaggregated method with an asset side logic. A second conclusion, which is more based on common sense, also suggests that the correspondence between the goodwill directly evaluated and the goodwill that would result as a difference—i.e., as a difference between market and book values of the equity—should be verified. The equality of the results of the two techniques has already been demonstrated, but in the practical calculation processes the matter is more complex. Let us see, first of all, how it is possible to determine the goodwill value through the indirect method. As a start, as far as the book value is concerned, some distortion effects caused by accounting procedures should be eliminated. Such effects should be identified so that the goodwill value is not distorted. In general terms, therefore, it is necessary to review the balance values and, subsequently, express them in current values. The review process usually consists of the following adjustments:

- analytical determination of assets and liabilities;
- actual entry in the accounts of all assets;
- quality of inventory documents;
- actual recoverability of debt;
- correctness of the provisions made.

Capital is then subject to an adjustment process intended to identify where necessary current values, which may differ from historic cost values. Usually the expression in current values of assets concerns in particular the following items:

- technical assets;
- investment properties;
- warehouse and supplies;

- fixed-interest securities;
- investment in associates;
- discounting of deferred debts and credits, with no interests or with interests not in line with the market.

The capital gains obtained as a result of expressing in current values should then be reduced in consideration of the tax levy. The procedure to determine the equity value is more articulated. If the stocks of the enterprise are listed in the market, then it is the market that gives a quotation. The same goes even for unlisted companies, using the available multiples. However, to verify that the goodwill value is plausible, it might be necessary to calculate the equity value directly, that is, look at the results that, in accordance with the company strategy, it is fair to expect in the future. Since this subject is not the purpose of this contribution, only a few remarks of a methodological and general nature are given below. According to a fairly common and consolidated valuation method, valuating the equity may start with valuation of the assets of the enterprise, which, as described above, may be obtained by an aggregated or disaggregated procedure (independent valuation of the benefits of the tax shield value). In the first instance, the total value of the company assets at the time t_0 (VA_0)—in the asset logic previously defined—may be calculated using the following general formula, based on an analytic method with terminal value: [11]

$$VA_0 = \sum_{t=1}^{T} \frac{FCFO_t}{(1+WACC^*)^t} + \frac{TV_{levered}}{(1+WACC^*)^T} \qquad [2.36]$$

where $TV_{levered}$ is equal to the terminal value of the enterprise. The valuation is basically broken down into two components, namely:

- one to analytically project the expected net operating flows in a T period and
- one where such projection is not realistically possible and which shows a terminal value, discounted at time T.

The terminal value, in turn, can be obtained using various methods, including multiples. Most of the time, within the DCF, the terminal value is estimated using a rent characterized by steady growth. In this way the terminal value $TV_{levered}$ would be equal to:

$$TV_{levered} = \frac{FCFO_{T+1}}{WACC^* - g} \qquad [2.37]$$

where $FCFO_{T+1}$,equal to $FCFO_T$ multiplied by (1 + g), is normalized and sustainable over an indefinite period of time (tending to infinity). It should

be reminded that the value shown in the [2.37] formula must then be discounted, that is, divided by $(1 + WACC)^T$, while a brief explanation of the meaning of the g value (growth rate) should also be given. The methods by which g is defined are manifold. According to some, for instance, the g value should be obtained from the expected growth rate in sector-specific consumption values with the addition of the inflation rate (Copeland et al. 1990). In the Gordon model, instead, *g* is associated, on one hand, with the propensity of the enterprise to reinvest over time and, on the other hand, with profitability. More precisely, *g* is determined as the product of expected profitability of new company investments and rate of reinvestment of flows (Gordon & Shapiro 1956, Gordon 1962):

(incremental net income : reinvestment) × (reinvested flow : generated flow)

For example:

- annual reinvestment rate = 20%;
- profitability of the new investment opportunities = 12%;
- g factor = 0.12 × 0.20 = 2.4%.

The g factor taken into consideration is for the sake of simplicity a constant g factor, while it is also possible to use multi-stages factors, for example in relation to the periods (g_1 and g_2), or to a temporary g factor, that is, a factor that exerts its effects over a limited period of time.[12] Going to the disaggregated method, instead, the general formula for the valuation of the total value of the assets is converted in the following way:

$$VA_0 = \sum_{t=1}^{T} \frac{FCFO_t}{[1+keU]^t} + \sum_{t=1}^{T} \frac{D_t \times kd \times tc}{(1+kd)^T} + \frac{TV_{unlelered}}{[1+keU]^T} + \frac{TV_{TS}}{(1+kd)^T} \quad [2.38]$$

As we can see, the most significant changes concern the terminal value, and in particular:

- the terminal value of the operating flows is unlevered, that is:[13]

$$TV_{unlevered} = \frac{FCFO_{T+1}}{keU - g} \quad [2.38]$$

- a terminal value is also introduced for the tax shield, which can be expressed in the following way:

$$TV_{TS} = \frac{D_0 \times kd \times t}{kd - g} \quad [2.39]$$

where D_0 = Net financial debt at the end of the analytical prevision.[14]

Once the total value of the operating assets of the enterprise has been determined,[15] it is then necessary to proceed to the following operations to obtain the final equity value (VME_0).

1. The value of cash-on-hand and marketable securities should be added to the value of operating assets (T_0).
2. Then it is necessary to add the value of those assets that are deemed ancillary (surplus assets, SA_0), that is, not included in the value of the invested operating capital (typically, as shown above, investment in associates and investment properties). Obviously, for the purpose of the indirect goodwill evaluation, this addend should not be included.
3. Finally, the value of the investments not as risk capital—and therefore not concerning ordinary shareholders—that is, the market value of financial debt and savings shares or, more in general, of shares with limited voting rights and more guaranteed, should be deducted (D_0).[16]

So:

$$VME_0 = VA_0 + T_0 + SA_0 - D_0$$

It is clear that, if we subtract from the VME_0 value the book value B, the result would not lead to the value of goodwill calculated through the direct method. The value of T_0 and A_0, in fact, do not contribute to the goodwill creation, which through the direct method has been calculated without considering the tax shield; so the following starting relationship is verified:

$$Gn_0 + T_0 + SA_0 + VTS = VME_0 - B$$

$$Gn_0 + T_0 + SA_0 + VTS = VA_0 + T_0 + SA_0 - D - B$$

since $D + B = C_0$ operating invested capital

$$Gn_0 + VTS = VA_0 - C_0$$

$$Gn_0 + C_0 = VA_0 - VTS$$

so, using once again the analytic evaluation method with terminal value, the value of goodwill calculated through the differential technique to be compared with the same value determined through the direct method is:

$$Gn_0 = \sum_{t=1}^{T} \frac{FCFO_t}{(1+keU)^t} + \frac{TV_{unlevered}}{(1+keU)^T} - C_0$$

REAL GOODWILL AND TERMINAL GOODWILL

A numerical example can be useful to explain the analytic development of the comparison and to introduce the concepts of real goodwill and terminal goodwill. We assume that FCFO, invested capital and economic profit are constant during the period of time s:

1. FCFO, constant for all the period s, equal to 300;
2. period s equal to 5 years;
3. growth equal to 0 for the period subsequent the five years of analytic forecast;
4. keU, equal to 10%;
5. invested capital, constant for all the period, equal to 2,500;
6. economic profit, constant for all the period, equal to 50.

Let us start by calculating the value of assets: discounting the flows for the five years of analytic forecast and summing a terminal value, based on the last year's flow, we obtain a value of 3,000 (1,137.24 + 1,862.76), which corresponds to the perpetual rent of 300 (at the rate of 10 per cent). Since the value of invested capital is equal to 2,500, the goodwill value obtained through the difference is equal to 500. Let us proceed directly, discounting the economic profit through the period of five years: we obtain a value of 189.54 and not of 500. It is clear that in this last formulation there is no terminal value: and, in fact, if the abnormal earnings flow, equal to 50, is capitalized with a rate of 10 per cent and the resulting value discounted,[17] we will obtain a value of 310.46 that summed to 189.54 leads to 500. If the enterprise, at the end of the five years, was closed and the assets paid back, there would not be the necessity to calculate a terminal value. In this case the overall value would be equal to 2,689.53, obtained alternatively as:

- sum of the FCFO discounted for the first four years (950.95) and of the last year's flow that includes the liquidation of the capital of 2,500 (2,500 + 300, discounted, equal to 1,738.58);
- sum of the five years' economic profits (189.53) and starting capital, 2,500.

So, in goodwill value is frequently implicit a terminal value. It would be always correct to highlight which part of the goodwill comes from an analytic evaluation during a specific period of time, defined real goodwill, and which part of the goodwill comes from a terminal value, defined terminal goodwill. Under our usual asset side and disaggregated formulations, with GnR real goodwill and GnT terminal goodwill (let us assume growth equal to 0):

$$\mathrm{GnR}_0 = \sum_{s=1}^{n} \frac{[y_s - (keU \times C_{s-1})]}{(1+keU)^s} \qquad [2.40]$$

$$\text{GnT} = \frac{[y_S - (keU \times C_S)]}{keU \times (1 + keU)S} \qquad [2.41]$$

In the evaluation of GnT it is possible to use the different options of the growth factor g (steady growth, temporary growth, multi-stages growth). In particular, under the hypothesis of steady growth:

$$\text{GnT} = \frac{[y_S - (keU \times C_S)] \times (1 + g)}{(keU - g) \times (1 + keU)^S} \qquad [2.42]$$

under the hypothesis of temporary growth:

$$\text{GnT} = \frac{[\text{y}_\text{S} - (\text{keU} \times \text{C}_\text{S})] \times \left[1 - \frac{(1+\text{g})^\text{s}}{(1+\text{keU})^\text{s}}\right]}{\text{keU} - \text{g}} + \frac{[y_{S+1} - (keU \times C_S)]}{keU \times (1 + keU)^S} \qquad [2.43]$$

under the hypothesis of multi-stages growth (two stages):

$$\text{G}_\text{T} = \frac{[y_s - (keU \times C_s)] \times \left[1 - \frac{(1+g_1)^S}{(1+keU)^S}\right]}{keU - g_1} + \frac{[y_{S+1} - (keU \times C_S)]}{(keU - g_2) \times (1 + keU)^S} \qquad [2.44]$$

Let us try to verify these conclusions assuming some more complex hypothesis and moving on the equity side. Let us consider the equity side evaluation process with the data represented in Table 2.3 (in which the Clean Surplus Relation is adopted and B is the equity book value, x is the net income and d stands for dividends).

Table 2.3 Real Goodwill and Terminal Goodwill

Years	*B*	*x*	*d*	*Rate*	*(1 + rate)^s*	*Discounted flow*	*Cost of capital (rate × B_{s-1})*	*Abnormal earning (x – cost of capital)*	*Discounted abnormal earnings*
0	100								
1	100	21	21	0.10	1.10	19.09	10	11	10.00
2	110	23	13	0.10	1.21	10.74	10	13	10.74
3	120	24	14	0.10	1.33	10.52	11	13	9.77
4	130	25	15	0.10	1.46	10.25	12	13	8.88
5	135	28	23	0.10	1.61	14.28	13	15	9.31
						64.88			48.70

First of all, it is possible to determine the equity value and the goodwill value through the indirect method:

1. as regards the equity, the terminal value is obtained capitalizing the terminal d value (dividends) equal to 23 with the perpetual rent and without growth (and discounting the value with the coefficient 1.61). The result is equal to 142.81;
2. the equity is equal to 64.88 + 142.81 = 207.69;
3. the goodwill calculated through the differential method is equal to 207.69 minus the B_0 value (100), that is 107.69.

And now to the evaluation through the direct method.

1. The abnormal earnings terminal flow is obtained deducting from 23 (and not from 28) the cost of capital equal to 13.5 (keU × B_5): the result is 9.5. To maintain the equality between the two methods it is necessary that the flow used for the terminal value determination should be the same: in this case the terminal abnormal earning comes from the d_5 value and not from x_5.[18]
2. The terminal goodwill is equal to 58.98 (9.5 capitalized in perpetuity with a 10 per cent rate and discounted with the coefficient 1.61).
3. The sum of the real goodwill, equal to 48.70 (see Table 2.3) and the terminal goodwill (58.98) is equal to 107.69 whereas the equity value is equal to 207.69.

It is easily verifiable that the equality between the two methods (direct and indirect) is verified even if a terminal value is not calculated , as already seen in the example above. In this case, in fact, the equity value calculated by summing the goodwill to the book value is equal to 148.7 (100 + 48.70). The same result is obtained by using the DDM, assuming the liquidation of the invested capital at the end of the last year. In fact, the value of flows in the four years is equal to 50.6, whereas the present value of the final dividend is equal to 98.11 [(130 + 28)/1.61]: the sum of the two values leads to 148.70.

CURRENT GOODWILL AND GROWTH GOODWILL

In addition to the distinction between real and terminal goodwill, let us see a further important breakdown. In Chapter 1 we have analyzed the relationship among market values, ROE and growth. We have seen that with the following values:

- book value = 20;
- ROE = 30%;

- ke = 0.08;
- $\frac{ROE}{ke} = 3.75$;
- VME = 100;
- $\frac{P}{B} = 5$.

the market value sustained by ROE was equal to 75 (20 multiplied by 3.75), whereas the residual value of 25 embodies growth conditions. At this point we can assess the implicit value of the growth: in fact, assuming a steady growth hypothesis [1.9]

$$\text{VME} = \frac{I}{ke} = \text{VE}$$

can be written in the following way:

$$\text{VME} = \frac{I}{ke - g} = \text{VE} \qquad [2.45]$$

and then:

$$\frac{VME}{B} = \frac{ROE}{ke - g}$$

from which it results that with a price to book value equal to 5, the implicit g value, under the hypothesis of steady growth, is equal to 2 per cent:

$$\frac{0.3}{0.08 - g} = 5$$

$$g = 0.02$$

So, analyzing the enterprise value and in particular the goodwill value, it is possible to clarify which part of the value implies a growth compared to the current profitability conditions, and which part doesn't imply any growth. Let us consider the values resulting from the example of the previous section, that is, a real goodwill equal to 189.54 and a terminal goodwill equal to 310.46. Let us maintain these values and modify the hypothesis adopted. Let us assume that the real goodwill value is obtained through the discounting of the expected future flows of economic profit analytically calculated for the next nine years (always with a rate equal to 10 per cent).

The abnormal earnings expected for the first year are equal to 28. If we assume that this condition remain constant for an indefinite period of time, we would obtain a value of 280 (28/0.1), which we define current goodwill. The current goodwill value can be broken down into two components: the real one and the terminal one. The real component is obtained from the net present value of the flow of 28 projected into the period of time of the analytic forecast (nine years), and it is equal to 161.25. The terminal component can

Table 2.4 Current Goodwill and Growth Goodwill

Years	*Abnormal earnings*	*Discounted abnormal earnings*	*Abnormal earnings analytic growth*	*Current abnormal earnings*	*Discounted current abnormal earnings*	*Discounted abnormal earnings analytic growth*
1	28	25.45		28	25.45	
2	32	26.45	4	28	23.14	3.31
3	32	24.04	4	28	21.04	3.01
4	33	22.54	5	28	19.12	3.42
5	33	20.49	5	28	17.39	3.10
6	34	19.19	6	28	15.81	3.39
7	34	17.45	6	28	14.37	3.08
8	38	17.73	10	28	13.06	4.67
9	38	16.12	10	28	11.87	4.24
		189.46	**50**		**161.25**	**28.20**

be calculated through the difference (280–161.25 = 118.75). To the current goodwill we have to add the growth goodwill, broken down into the real (real growth goodwill) and the terminal components (terminal growth goodwill).

As regards the real component, let us examine the third and the last column of the Table 2.4, in which it is expressed the overall growth of the abnormal earnings for the period of analytic prevision compared to the initial conditions (equal to 28). The discounting of this growth leads to the real growth goodwill equal to 28.20. The sum of real current goodwill (161.25) and of the real growth goodwill (28.29) is equal to 189.4, which is the real goodwill. To evaluate the terminal growth goodwill it is necessary, first of all, to define the overall terminal goodwill. Let us assume for example to capitalize in perpetuity a terminal economic profit of 51.25, with a rate equal to 0.1 and a g factor equal to 3 per cent, under the steady growth conditions. The value of 51.25, capitalized with a rate of 7 per cent (10 per cent decreased by 3 per cent) leads to the value of 310.5 (approximately equal to the one assumed in the example). We can now express it as terminal current goodwill and terminal growth goodwill. The terminal growth goodwill is that part of the terminal value attributable to the growth benefits. We know that the current terminal goodwill is equal to 118.75 and then through difference, the value of the terminal growth goodwill will be equal to 310.5–118.75 (191.75). Formalizing the values mentioned above:

$$\mathrm{GnRC}_0 = \sum_{s=1}^{n} \frac{[\bar{y} - (keU \times C_{s-1})]}{(1+keU)^s} \qquad [2.46]$$

$$\mathrm{GnRG}_0 = \sum_{s=1}^{n} \frac{[(y_s - \bar{y}) - (keU \times C_{s-1})]}{(1+keU)^s} \qquad [2.47]$$

$$GnTC_0 = \frac{\bar{y}}{keU} - GnRC_0 \qquad [2.48]$$

$$GnTG_0 = GnT_0 - GnTC_0 \qquad [2.49]$$

With:

$GnRC_0$: real current goodwill;
$GnRG_0$: real growth goodwill;
$GnTC_0$: terminal current goodwill;
$GnTG_0$: terminal growth goodwill;
GnT_0: terminal goodwill;
$\bar{y}$: operative current profit, constant for all the period of analytic prevision.

In Table 2.5 are represented the four breakdown values: in this way also the overall current goodwill (280) and the overall growth goodwill (219.95) emerge. Let us remark that the distinction of the nature of the expected excess return flows is common to a lot of models. For example, dealing with EVA, we distinguish an EVA current flow, capitalized with the perpetual rent, and a flow of EVA that is the result of the growth during the time.[19]

Table 2.5 Real, Terminal, Current and Growth Goodwill

	Real	*Terminal*	
Current	161.25	118.75	280
growth	28.29	191.75	219.95
	189.54	310.46	499.95

IN BRIEF

In this chapter we have analyzed the main operational methods that can be used to calculate the going-concern goodwill of an enterprise, and we have established that the disaggregated asset side method is the most appropriate procedure. In particular, in this chapter (Figure 2.4):

1. we have analyzed the relations between the Residual Income Model and the Dividend Discounted Model;
2. we have covered the main critical aspects relative to capital cost in determining the goodwill;
3. we have made considerations on the differences between asset side and equity side valuations.

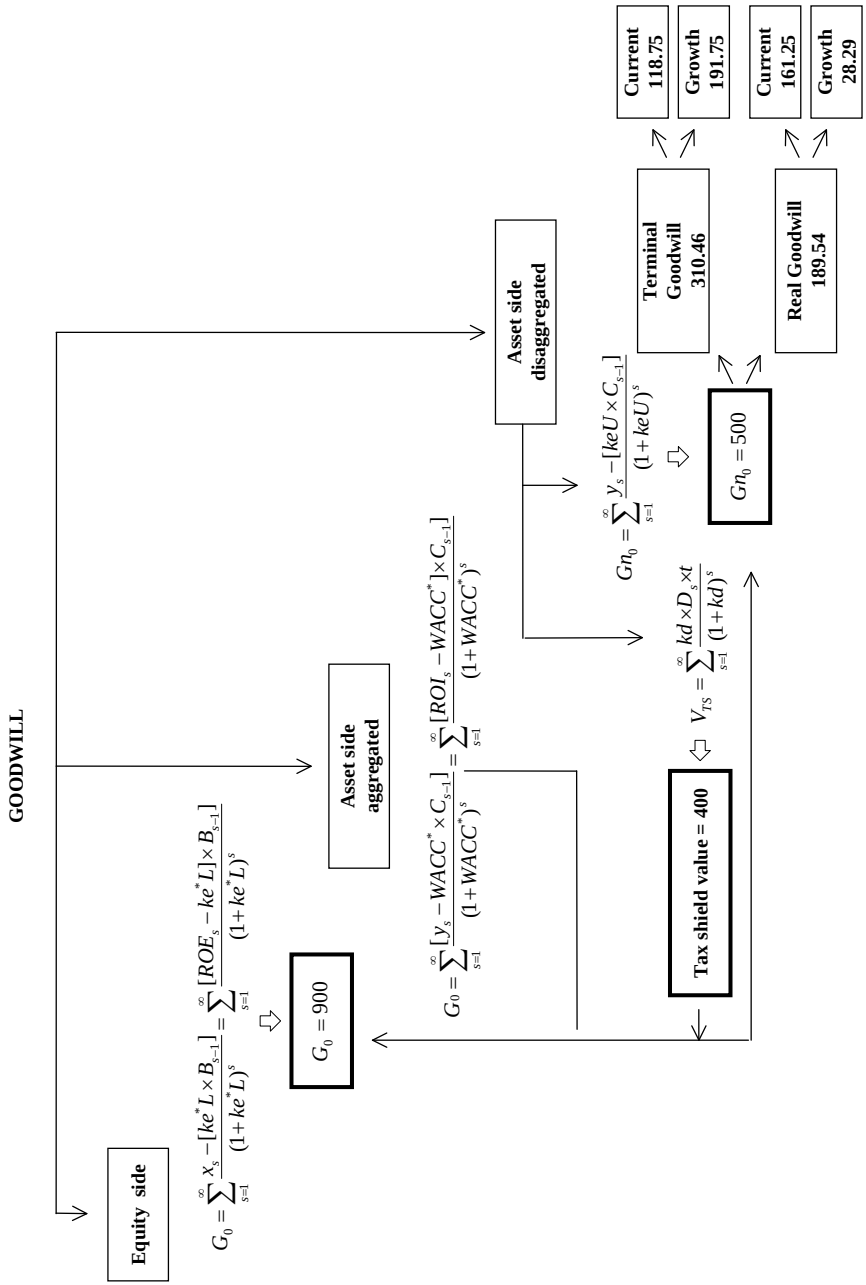

Figure 2.4 In brief.

Moreover, from the analysis emerges also the possibility of breaking down the goodwill value with reference to the following aspects:

1. the tax shield value;
2. the distinction between real and terminal goodwill;
3. the distinction between current and growth goodwill.

3 Business Goodwill and Corporate Goodwill

STRATEGIC BUSINESS UNITS AND GOODWILL

The analysis carried out in Chapter 2 has allowed the identification of a basic formula for the calculation of goodwill:

$$Gn_0 = \sum_{s=1}^{\infty} \frac{[y_s - (keU \times C_{s-1})]}{(1+keU)^s} \qquad [2.34]$$

in which:

y_s: operating profit after tax in the accounting period s, i.e., operating profit multiplied by (1–t);
keU: cost of unlevered equity;
C_{s-1}: operating capital invested at end of period s–1. Excluding other activities from the analysis (see Chapter 2), the value of the invested operating capital is equal to the sum of equity book value (B) and financial debt (D).

This procedure is based on an asset side approach and allows the generation of a goodwill after the tax shield value. It should be reminded that a goodwill breakdown consists of dividing the goodwill value into smaller portions, adopting each time different analysis logics. The breakdown process is unitary and therefore it is appropriate to keep in mind the relations existing between the breakdown techniques adopted from time to time. Moreover, it is reasonable to combine these techniques in an effort to obtain from them meaningful information. We will now describe a breakdown technique that can be fairly considered fundamental for the purpose of our analysis, since it consists of relating the goodwill value to the business areas where a given enterprise operates (business goodwill) and, in some instances, to corporate resources (corporate goodwill).

The terms business goodwill and corporate goodwill bear different meanings, especially in common language and non-specialized literature, and are used interchangeably with other terms, such as personal goodwill or location

goodwill. In this book, business goodwill and corporate goodwill are components of the overall goodwill that are relative to portions of the abnormal earnings and invested capital obtained and used by an individual business or by the corporation. The role of a business area is fundamental, and it takes particular relevance in the SoP (Sum of the Parts) evaluation methods. The phenomena of profitability and abnormal earning in fact may reveal characteristics and dimensions that greatly differ within the same company depending on the competitive environment from which they originate. On a practical level, this breakdown is obviously meaningful for multi-business enterprises and not for single-business enterprises. However, identification of businesses should be carried out with a fair amount of accuracy, in order to avoid mistaking a business area for a business unit. The former in fact (strategic concept) does not necessarily correspond to the latter (organizational concept) (Abell 1980). This chapter will cover the following main subjects:

- identification of business areas where a given enterprise operates;
- evaluation of business goodwill;
- analysis of the risk compensating effect (RCE);
- role of corporate costs and assets;
- estimation of corporate goodwill.

Let us bear in mind that the methods that allow the breakdown of the enterprise goodwill (Chapter 2) in real, terminal, current and growth goodwill are applicable with the same logic also to business and corporate goodwill: therefore this chapter will not deal with them.

IDENTIFICATION OF BUSINESS AREAS

In order to determine a business goodwill value, it is first necessary to identify the business area where an enterprise operates. According to Abell, in a contribution that by now can be fairly considered a classic, business areas form in relation to specific competitive choices made by the enterprises and concern needs to be met (why), clients to be served (who) and technologies to be used, also including the nature of the product/service (how) (Abell 1980). Moreover, for each of these variables, a company makes two other strategic choices:

- the amplitude of its offering (scope), which can be large or restricted;
- the degree of differentiation towards demand (specific offers for segments of clients) or towards offer (differentiation from buyers).

In this way, three business models emerge:

1. a differentiated approach, aiming at a great differentiation into multiple demand segments;

2. an undifferentiated approach, whereby all segments are served by a single, undifferentiated proposal;
3. a focused approach, whereby a single segment is served with a high level of differentiation.

A business area forms in relation to the way in which the business definitions of the various competitors meet; that is, interweaving and overlapping business definitions originate the variegated competitive arenas. A business area does not coincide with an industry, even though both concepts are useful for the definition of a competitive system. In fact, it is fair to say that:

- an enterprise defines its business based on different combinations of clients/functions/technology, as well as on the choices of focalization and differentiation;
- a business, intended as a competitive arena, results from the way in which the various enterprises define their businesses; in particular it originates from the way in which clients and functions intertwine with each other;
- an industry basically corresponds to a technology (or a homogeneous group of technologies) and may include different types of clients and different functions (besides different competitive arenas, which however may also be transversal to the industries).

The next chapter will go back to the relation between business and industry, analyzing among other things the strategic choices that an enterprise makes in terms of business area. For now it should be reminded that the identification of business areas may certainly also rely on segment-reporting information, as provided for by the accounting principles IASB (IFRS 8, Operating Segments) and FASB (SFAS 131, Disclosures About Segments of an Enterprise and Related Information) which follow criteria that are very similar. However, the criteria formally used to identify the segments must necessarily be fully consistent with the substantial strategic logics described in this section. The choice that was made first by FASB (1997) and then by IASB (2006) to have segment reports match up with the reports internally used by the management for decision-making purposes certainly follows this direction. In this way the likelihood that segment information is developed consistently with the strategic logics for the identification of strategic areas greatly increases.

EVALUATION OF BUSINESS GOODWILL

Once the various business areas have been identified, we are able to calculate which portion of goodwill forms in each of them. Given that Gnb_r is the goodwill of an enterprise in business area r, the following applies:

$$Gnb_{r0} = \sum_{s=1}^{\infty} \frac{[yb_{rs} - (keb_r U \times Cb_{rs-1})]}{(1+keU)^s} \qquad [3.1a]$$

in which:

yb_{rs}: operating profit of business area r after tax in the accounting period s;
$keb_r U$: cost of unlevered equity computed in relation to business area r;
keU: cost of unlevered equity computed in relation to the enterprise as a whole;
Cb_{rs-1}: operating capital invested in business area r at end of period s–1.

Major shortcomings of formula [3.1a] are due to the nature of the relation between the values used at a business level (profit, capital and rates) and the same values used at a corporate level. For now we can assume that the sum of operating profits obtained in each individual business area, as well as the sum of the operating capital allocated in these, is equal to the overall operating profit and the overall operating capital, respectively. Therefore, with reference to the operating profit obtained in accounting period s and the operating capital in the s–1 period, the following relations shall apply to an enterprise operating in m business areas:

$$y_s = \sum_{r=1}^{m} yb_{rs} \qquad [3.2]$$

$$C_{s-1} = \sum_{r=1}^{m} Cb_{rs-1} \qquad [3.3]$$

Furthermore, with regard to the value of the unlevered rate, the method analyzed in the section in Chapter 2 titled "Measure of the ke Rate, Cost of Equity" can be used; that is, the assumption can be made that the keU value of the enterprise is equal to the weighted average of the $keb_r U$ values of each individual business, which in turn are obtained using some industry-specific unlevered beta values. If, for weighing purposes, the amount of operating capital invested in each business is chosen, then:

$$keU = \sum_{r=1}^{m} keb_r U \times \frac{Cb_{rs-1}}{C} \qquad [3.4]$$

with

$$keb_r U = Rf + \beta U_r (Rm - Rf)$$

in which βU_r, is the industry-specific unlevered beta value applicable to business area r. Two simplifications are here introduced that will also be used in the next chapter: the first one is about the coincidence, at least as far as the beta value is concerned, of industry and business, and the second

one concerns the coincidence of the risk rate of the business and the risk rate of the enterprise in the business. Further on the issue of rates, it should be noted that the rate used in the denominator of formula [3.1a], that is, the rate by which abnormal earning flows are capitalized for each business area, corresponds to the overall rate, obtained from the weighted average [3.4]. From an algebraic viewpoint, the reason is easily demonstrable, since the relation indicated below applies (for the sake of simplicity, it is based on two business areas only and the perpetual rent[1]).

$$\frac{y - keU \times C}{keU} = \frac{yb_1 - keb_1U \times Cb_1}{keU} + \frac{yb_2 - keb_2U \times Cb_2}{keU}$$

An algebraic logic certainly coincides with an economic logic. If the rate used in the numerator were used in the denominator when calculating business goodwill values (that is keb_rU and not keU), then the overall abnormal earnings, which do not vary, would be basically capitalized at a different rate with respect to the company rate and, as a result, the sum of economic profits obtained in the areas would be equal to the total economic profit, while the sum of goodwill values would not be equal to the overall goodwill. As a consequence, an interesting effect can be observed, which we will define as risk compensating effect (RCE), whereby if the abnormal earnings flows obtained in each business area were capitalized at the rate of each area, then the sum of the business goodwill values would be different from the overall goodwill, namely either greater (negative RCE) or lower (positive RCE). For now, applying all the tactics described with regard to operating profit, capital and rates, it is possible to recognize the validity of the following equation:

$$\text{Gn} = \sum_{r=1}^{m} Gnb_r \qquad [3.5]$$

moreover, introducing RCE

$$\text{Gn} = \sum_{r=1}^{m} Gnb_r \pm RCE \qquad [3.6]$$

in which Gnb_r is now calculated as follows

$$\sum_{s=1}^{\infty} \frac{[yb_{rs} - (keb_rU \times Cb_{rs-1})]}{(1 + keb_rU)^s} \qquad [3.1b]$$

A numerical example may help clarify the steps illustrated above. Using the same data as Chapter 2, let us assume again a projection of flows in perpetuity:

- operating profit after tax (y) = 300;
- cost of unlevered equity keU = 0.1;
- invested capital (book value) (C) = 2,500.

As previously shown in Chapter 2, a goodwill value of 500 is obtained:

$$Gn_0 = \frac{300 - 0.1 \times (2{,}500)}{0.1} = 500$$

Let us assume that the enterprise obtains these overall results operating in two different business areas (b_1 and b_2). Additional available data are as follows:

- operating capital b_1 = 1,500;
- operating capital b_2 = 1,000;
- operating profit b_1 = 170;
- operating profit b_2 = 130;
- unlevered beta b_1 = 0.9;
- unlevered beta b_2 = 1.4;
- risk free rate = 4.5 per cent;
- risk premium = 5.0 per cent.

It is necessary first of all to calculate the keb_1U and keb_2U rates and verify that, with these input data, their weighted summation is related to the overall keU value. Hence,

$$keb_1U = 0.045 + 0.9 \times 0.05 = 9\%$$

$$keb_2U = 0.045 + 1.4 \times 0.05 = 11.5\%$$

Given that the incidence of the b_1 operating capital on the total operating capital is equal to 60 per cent and that the incidence of the b_2 operating capital is equal to 40 per cent, keU is actually equal to 10 per cent:

$$keU = 0.09 \times 0.6 + 0.115 \times 0.04 = 10\%$$

Now that this equality has been verified, it is possible to calculate the two business goodwill (Gnb_1 and Gnb_2) values.

$$Gnb_1 = \frac{170 - 0.09 \times (1{,}500)}{0.1} = \frac{35}{0.1} = 350$$

$$Gnb_2 = \frac{130 - 0.115 \times (1{,}000)}{0.1} = \frac{15}{0.1} = 150$$

$$Gn = Gnb_1 + Gnb_2 = 350 + 150 = 500$$

The trend of the general profitability of an enterprise combined with the specific trend of the business should be noted. The operating profitability of an enterprise in fact is equal to 12 per cent (300, in relation to the invested capital of 2,500). The goodwill value in fact emerges due to a spread of two

percentage points between profitability (12 per cent) and opportunity cost (10 per cent). However, the two businesses show a different profitability and more precisely for business 1:

$$\frac{170}{1{,}500} = 11.3\%$$

and for business 2:

$$\frac{130}{1{,}000} = 13\%$$

Furthermore, profitability should not be mistaken for the spread between profitability and cost of capital, in relation to which the results of the two businesses swap. In fact:

spread 1 = 11.3% – 9% = 2.3%

spread 2 = 13% – 11.5% = 1.5%

Obviously, multiplying these spreads by the value of the invested capital (respectively, 1,500 and 1,000) the abnormal earnings of the two business areas can be obtained, as indicated below:

business 1 = 2.3% × 1,500 = 35

business 2 = 1.5% × 1,000 = 15

The business area with a lower profitability has a higher spread with respect to the opportunity cost of invested capital and therefore reaches a better performance in the generation of the abnormal earnings. Finally, let us now take a look at what happens to the risk compensating effect (RCE). If the abnormal earnings flows of 35 and 15 were capitalized at their respective risk rates (9 per cent and 11.5 per cent), business goodwill values would respectively be equal to 388.89 (+38.89) and 130.43 (–19.67). The overall goodwill therefore would be higher, namely equal to 519.32: the RCE value therefore is negative (–19.32). In our example the compensating effect negatively affects business 1 which is the business with the best spread (2.3 per cent as opposed to 1.5 per cent of business 1). Business 2 benefits from the compensating effect but, since its spread is not as good, it cannot counterbalance the sacrifice of business 1. Hence, letting the compensating effect emerge, the following results:

$$Gn = Gnb_1 + Gnb_2 + RCE = 388.89 + 130.43 - 19.32 = 500$$

BUSINESS GOODWILL VALUES AND RISK COMPENSATING EFFECT (RCE): AN IN-DEPTH ANALYSIS

The risk compensating effect is based on the relation between the rate used for the entity as a whole and those used at a business level. In brief, the

compensating effect represents the opportunity cost associated with the various profiles of the business areas and the way in which the capital is distributed among them. Adopting the data of the example developed in the previous section, let us take a closer look at the variables that cause the phenomenon. Let Sp_1 be the spread between profitability and cost of capital in the first business area and let Sp_2 be the spread in the second business area. The RCE value can be obtained as follows:

$$\text{RCE} = \frac{Sp_1 \times Cb_1}{keU} + \frac{Sp_2 \times Cb_2}{keU} - \left[\frac{Sp_1 \times Cb_1}{keb_1U} + \frac{Sp_2 \times Cb_2}{keb_2U} \right]$$

$$\text{RCE} = Sp_1 \times Cb_1 \left(\frac{1}{keU} - \frac{1}{keb_1U}\right) + Sp_2 \times Cb_2 \left(\frac{1}{keU} - \frac{1}{keb_2U}\right)$$

where $\left(\frac{1}{keU} - \frac{1}{keb_1U}\right)$ and $\left(\frac{1}{keU} - \frac{1}{keb_2U}\right)$ are defined as compensation coefficient and denoted as COM_1 and COM_2, RCE will be equal to:[1]

$$\text{RCE} = (Sp_1 \times Cb_1 \times COM_1) + (Sp_2 \times Cb_2 \times COM_2)$$

in our example in fact:

$$\text{RCE} = 35 \times (-1.1111) + 15 \times (+1.3043) = -19.32$$

In general terms, with m business areas:

$$\text{RCE} = \sum_{r=1}^{m} Sp_r \times Cb_r \times COM_r \qquad [3.7]$$

in which

$$COM_r = (keU^{-1} - keb_rU^{-1}) \qquad [3.8]$$

The risk compensating effect at a corporate level is equal to the sum of the compensating effects calculated at the level of each business area. Such effects depend first of all on compensation coefficients, which can be either positive or negative depending on whether keU at an entity level is respectively lower or higher than the rate calculated with reference to the individual business area. In fact, when kebU > keU (COM is positive), the abnormal earnings of the business area are being capitalized at the more favorable rate, that is, keU. Conversely, when kebU < keU (COM is negative), abnormal earnings are being capitalized at the less favorable rate (keU). If the rate at the business level is equal to the rate at a corporate level, then the coefficient is equal to 0 and the risk compensating effect disappears at least for that specific business area. Moreover, the impact of this

difference—either positive or negative—varies to a higher or lower degree according to the abnormal earnings (spread multiplied by capital) of each business. In order to better understand the meaning and the impact of the RCE phenomenon, we might want to change the value of the capital allocated to the two business areas, and more precisely:

- the capital in business 1 becomes equal to 2,000 (80 per cent) and in business 2 to 500 (20 per cent);
- the profitability rates in the two businesses remain however unaltered, that is, 11.3 per cent in business 1 and 13 per cent in business 2, therefore, respectively, with a profit of 226 and 65 (total profit: 291);
- keUb rates remain unchanged in the two businesses, 9 per cent and 11.5 per cent respectively: also the two spreads remain unchanged;
- the keU value at an entity level changes, because the allocation of the capital modifies and consequently also the weights at which the rate is calculated. It goes from 10 per cent to 9.5 per cent (greater weight to the less risky business area). Since the general profitability is equal to 11.6 per cent (291 divided by 2,500), the total spread slightly increases from 2 to 2.1 percentage points (11.6 per cent less 9.5 per cent);
- total goodwill is higher, $\frac{(291-0.095\times 2{,}500)}{0.095}=\frac{53.5}{0.095}=563.15$, due to a lower risk rate which also results in a slightly higher spread;
- without considering the risk compensating effect, the business goodwill of area 1 naturally becomes a lot higher: $\frac{(226-0.09\times 2{,}000)}{0.095}=\frac{46}{0.095}=484.21$, (instead of 350).
- The business goodwill of the second area decreases:
- $\frac{(65-0.115\times 500)}{0.095}=\frac{7.5}{0.095}=78.94$ (instead of 150);
- discounting the above-normal earnings of the two business areas at the respective rates, business goodwill values become respectively equal to 511.11 and 65.21, with a total of 576.32: the risk compensating effect is therefore equal to–13.17 (563.15–576.32 =–13.17) and therefore Gn = Gnb_1 + Gnb_2 + RCE = 511.11 + 65.21–13.17 = 563.15;
- all in all, a more effective distribution of the capital towards the business area having a more favorable spread improves total goodwill: the risk compensating effect remains negative although to a lower extent, basically because the negative compensation coefficient (COM_1) is reduced (from –1.111 to –0.5848).

***

Figures 3.1, 3.2 and 3.3 in conclusion show a graphical summary of a few examples of business goodwill analysis. Figure 3.1 shows the spread value of each business, relating it to profitability and business risk.

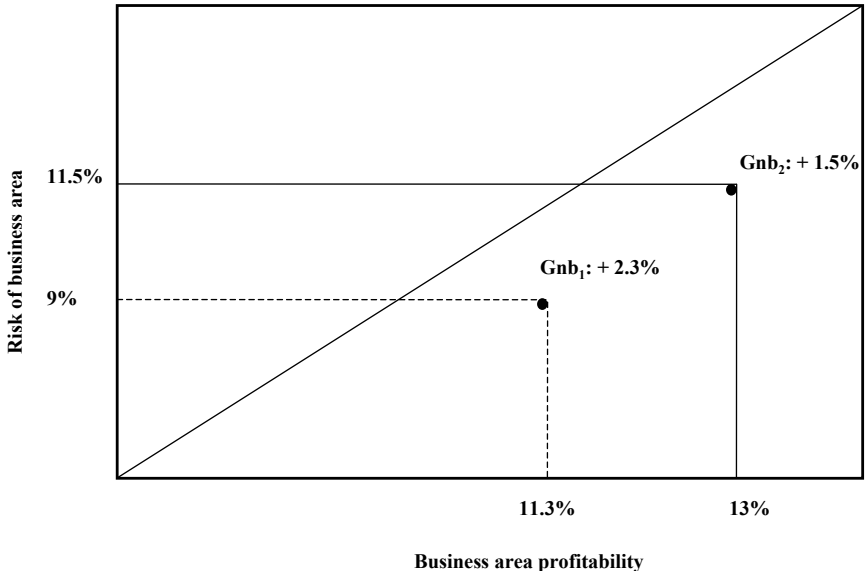

Figure 3.1 Business areas' spread.

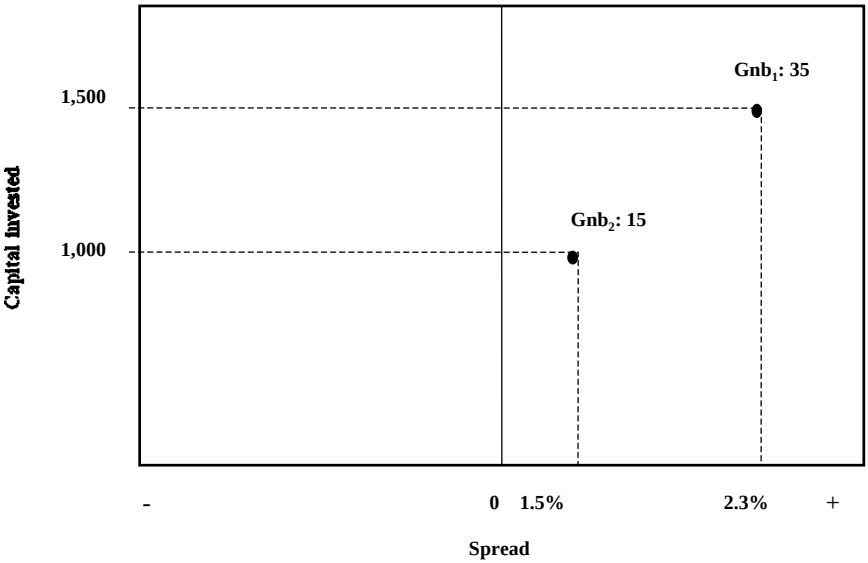

Figure 3.2 Business areas' abnormal earnings.

Figure 3.2 shows the abnormal earnings for each business, relating it to spread and invested capital.

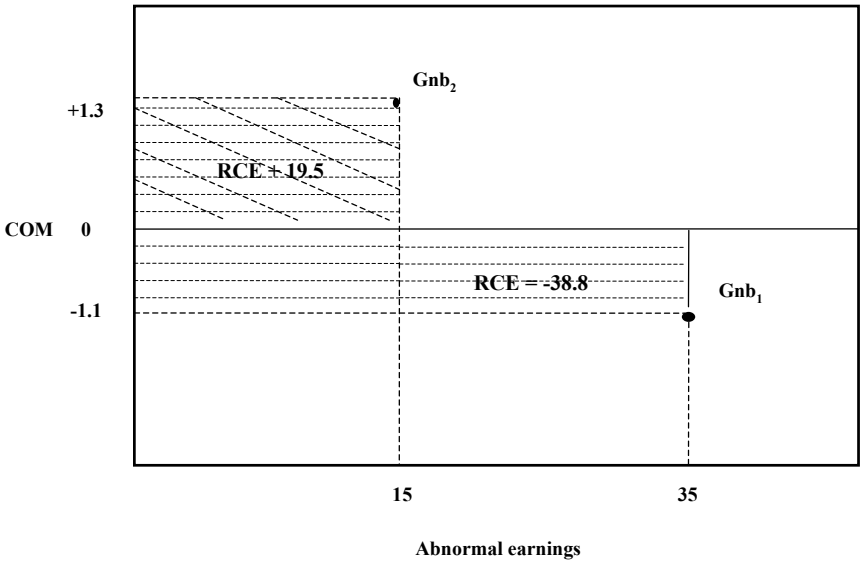

Figure 3.3 Business areas' RCE.

Finally, Figure 3.3 compares abnormal earnings (spread per capital) and compensating coefficients (COM), that is, the two variables determining the risk compensating effect.

It is evident that the more a business shifts towards the right side and the bottom, the higher the opportunity cost that can be associated with that business area; i.e., goodwill increases allocating the capital in it.

ASSETS AND COSTS AT A CORPORATE LEVEL

It should be reminded that the procedure described in the last section requires that all operating activities be allocated within the business areas, just like the operating profit. Actually, even significant portions of operating costs and assets do not necessarily have to follow this course. This is due in part to mere operating difficulties, which can be remedied with prorated attributions to the business areas, also using the most traditional reversal techniques, and in part to the fact that it might be appropriate to highlight the role played by corporate in consuming resources.

Considering that subsidiary and extraordinary activities have already been excluded from the calculation of the enterprise goodwill (Chapter 2), the allocation of assets and costs to businesses or corporate should be made according to the following basic logic:

1. direct allocation of tangible and working assets to business areas and corporate;

2. allocation of direct costs to business areas and corporate;
3. attribution of all costs and assets (if any) from corporate to business, based on the most appropriate parameters: as an alternative, all or some of these costs and assets may remain at a corporate level;
4. credit or debit of an equal amount between strategic areas based on the internal transfer price.

The adoption of an asset side valuation model does not require the attribution of capital sources to the businesses and corporate level, thus significantly simplifying the analysis process. Regarding the various steps previously identified, it is appropriate to analyze more deeply the third one, which includes the partial or total attribution of costs and assets from corporate to business areas. To this purpose, in fact, the logics followed by activity-based costing and activity-based accounting may prove somehow useful (Johnson & Kaplan 1987). Activity-based costing consists of recording company costs first of all by single activity, in relation to the level of absorption of production factors, and then by final cost item (typically, the product but also other final items) in relation to the absorption of the activities. These two steps are carried out using respectively resource cost drivers, or process drivers, that is, cost parameters or determining factors that allow measurement of how each activity takes up production factors, and cost activity drivers, or activity drivers, which are also cost determining factors that allow measurement of activity consumption on the part of final cost items (Kaplan & Cooper 1998). Therefore, the steps typical of the development of phase 3 are as follows:

1. identification of cost final items (in this case, the strategic areas);
2. identification of activities and possible inclusion of these in homogeneous groups of macro activities (Activity Cost Pool);
3. identification of process drivers;
4. determination of costs and assets to be attributed to the activities;
5. identification of activity drivers;
6. determination of costs and assets to be attributed to the businesses.

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As stated earlier, in some instances the attribution of corporate resources to business areas may turn out to be a quite meaningless operation, because the approximation is too large and because it is in any case appropriate to highlight specific uses of the resources at a corporate level. To better understand the implications of this possibility, we will use again a few numerical examples. First of all, it is necessary to identify a few costs, in the amount of 80, that cannot be allocated to strategic areas, since they are corporate costs; i.e., they reflect consumption relative to the overall management of the enterprise that cannot be attributed directly to business units.

Table 3.1 Corporate Costs (1)

	Business 1	*Business 2*	*Total*
Revenues	790	420	1210
Cost	430	200	630
Business gross operating profit	360	220	580
Business net operating profit	216	132	
Corporate costs			80
Entity gross operating profit			500
Entity net operating profit			300

Table 3.1 shows the most relevant data for the purpose of our simulation. With respect to the original numerical example, gross operating profit and operating profit after tax remain unvaried, respectively in the amount of 500 and 300. However, a few corporate costs (CC), in the amount of 80, come into play, which cannot be attributed to the businesses. Such costs therefore are excluded from the income statements of each business, whose gross operating profit in fact increases to 360 (business 1) and 220 (business 2). Applying a tax levy of 40 per cent to 360 and 220, the business net operating profits can be obtained:

$$360 \times (1-0.4) = 216$$

$$220 \times (1-0.4) = 132$$

Obviously, corporate costs have a tax effect too. In fact, shifting from values before tax to values after tax may also be represented as follows:

$$360 + 220 - 80 = 500$$

$$(360 + 220 - 80) \times (1-0.4) = 500 \times (1-0.4)$$

$$360 \times (1-0.4) + 220 \times (1-0.4) - 80 \times (1-0.4) = 500 \times (1-0.4)$$

$$216 + 132 - 48 = 300$$

The value of 48 (80 multiplied by 0.6) identifies the extent of the influence of corporate costs on the income statement after the tax relief that their deductibility implies. It is possible therefore with these basic data to make further calculations, setting aside for a moment the risk compensating effect. For example, we might calculate the goodwill of the two businesses with these higher net operating profits. In fact, keeping the values of invested capital in both businesses and the reference rated unaltered, the following results:

$$Gnb_1' = \frac{216 - 0.09 \times (1{,}500)}{0.1} = \frac{81}{0.1} = 810$$

$$Gnb_2' = \frac{132 - 0.0115 \times (1{,}000)}{0.1} = \frac{17}{0.1} = 170$$

The sum of the two goodwill values results into an overall value of 980, which is equal, subtracting the capitalized value of corporate costs (CC) in the amount of 480 (48 capitalized at the rate of 10 per cent), to the entity as a whole goodwill value of 500:

$$Gn = Gnb_1' + Gnb_2' - CC = 810 + 170 - 480 = 500$$

The increase in the two business goodwill values, well evident in Gnb_1', exclusively depends on the lower costs attributed to the two businesses, in consideration of revenues and invested capital that have instead remained unvaried. Let us assume now that a portion of the invested capital is not attributed to businesses, but is instead allocated within the corporate structure (corporate asset [CA]). More precisely the assumption should be made that the invested capital is distributed as follows:

- business 1 = 1,200;
- business 2 = 800;
- corporate = 500.

For the sake of simplicity, an effort has been made to keep constant the relation between the invested capital in business 1 and the invested capital in business 2. Keeping unaltered all other data relative to costs and revenues, the new goodwill values can be calculated as follows:

$$Gnb_1'' = \frac{216 - 0.09 \times (1{,}200)}{0.1} = \frac{108}{0.1} = 1{,}080$$

$$Gnb_2'' = \frac{132 - 0.0115 \times (800)}{0.1} = \frac{40}{0.1} = 400$$

The relation between entity goodwill and business goodwill, which are even higher since they have been determined using less capital, can be represented as follows:

$$Gn = Gnb_1'' + Gnb_2'' - CC - CA = 1{,}080 + 400 - 480 - 500 = 500$$

We might also want to introduce, so as not to leave anything out, a further hypothesis, according to which the identification of corporate assets supposedly also requires the identification of (amortization) costs to be allocated to corporate and no longer to businesses.

Table 3.2 shows a different allocation of costs. A value of 20 is subtracted from the two businesses (10 + 10) and added to corporate costs

Table 3.2 Corporate Costs (2)

	Business 1	*Business 2*	*Total*
Revenues	790	420	1210
Costs	420	190	610
Business grossoperating profit	370	230	600
Business net operating profit	222	138	
Corporate costs (with corporate asset amortization)			100
Entity gross operating profit			500
Entity net operating profit			300

(from 80 to 100, equal to 60 net of tax relief). The following relation can be obtained calculating goodwill values using the new data:

$$Gn = Gnb_1''' + Gnb_2''' - CC - CA = 1{,}140 + 460 - 600 - 500 = 500$$

For the sake of brevity, we will limit the calculation of the risk compensating effect only to this last version, and therefore:

$$Gn = Gnb_1''' + Gnb_2''' - RCE - CC - CA =$$
$$1{,}266.66 + 400 - 66.66 - 600 - 500 = 500$$

Versions Gnb', Gnb'' and Gnb''' allow identification of the role of costs and assets at a corporate level, consistently with an evaluation practice, according to which the overall value of the assets of a multi-business enterprise is equal to the sum of the value of the assets of each business less the actual value of the expected overhead costs. Using as a reference the information obtained from the last formulation, which includes the risk compensating effect, we come to the following exemplifying conclusions:

- with a business goodwill equal to 100, contribution of business 1 is 76 per cent and of business 2 is 24 per cent;
- the weight of the resources invested to realize it at corporate (500) is equal to 20 per cent of overall invested capital (500 divided by 2,500);
- with the total of business goodwill values equal to 100, net present value of the resources allocated to corporate is equal to 66 per cent (600 + 500 divided by 1,666.66);
- with the total of business goodwill values equal to 100, the (negative) weight of risk compensating effect is not greater than 4 per cent.

CORPORATE GOODWILL

Is it possible to determine the role played by corporate resources in the goodwill composition? In other words, is it possible to estimate a corporate goodwill? In an effort to provide an answer to the above questions, we will make

Table 3.3 Corporate Revenues

	Business 1	*Business 2*	*Total*
Revenues	632	378	1010
Costs	420	190	610
Business gross operating profit	212	188	400
Business net operating profit	127.2	112.8	
Revenues attributed to corporate			200
Corporate costs			100
Corporate gross operating profit			100
Corporate net profit			60
Entity gross operating profit			500
Entity net operating profit			300

a numerical example, introducing a hypothesis with many implications. Let us assume in fact that it is possible to determine to what extent corporate resources (CC and CA) contribute to the generation of revenues in the two businesses. More precisely, let us assume that 20 per cent (158) and 10 per cent (42) of the revenues of the two businesses should be attributed to corporate contributions. It is certainly evident that such hypothesis might result in the full attribution of corporate costs and assets to the businesses, therefore going back to the conditions described in the section titled "Assets and Costs at a Corporate Level" (phase 3). In this case, we wish instead to proceed in a different manner, that is, with the attribution of some revenues to corporate and of some corporate costs to businesses. This operation is shown in Table 3.3.

The main passages that characterize the values shown in Table 3.3 are listed below:

1. the revenues attributed to the two businesses have been respectively reduced by 20 per cent and 10 per cent, subtracting 158 in business 1 and 42 in business 2: (790–158 = 632) and (420–42 = 378);
2. the sum of 158 and 42 originates a value that can be conventionally defined as "corporate revenues" in the amount of 200;
3. the corporate result is equal to the difference between corporate revenues (200) and overall corporate costs that, in the last hypothesis included in table 3.2, are equal to 100: hence, the corporate result is equal to 100;
4. a tax levy, in the amount of 40 per cent, should obviously be applied to such result; therefore, the net corporate result is equal to 60;
5. the sum of net results of business 1 (127.2), business 2 (112.8) and corporate (60) is equal to the entity net operating profit: (127.2 + 112.8 + 60 = 300).

These data allow a recalculation of business goodwill values and at the same time the calculation of a corporate goodwill as well (which we denote

as Gnc). In fact, keeping the hypotheses previously formulated with regard to rates and reminding that the invested capital at a corporate level was equal to 500, the following values are obtained:

$$Gnb_1 = \frac{127.2 - 0.09 \times (1{,}200)}{0.1} = \frac{19.2}{0.1} = 192$$

$$Gnb_2 = \frac{112.8 - 0.0115 \times (800)}{0.1} = \frac{20.8}{0.1} = 208$$

$$Gnc = \frac{60 - 0.1 \times (500)}{0.1} = \frac{10}{0.1} = 100$$

Calculating now the risk compensating effect (RCE), different values can be obtained, namely:

$$Gnb_1 = \frac{19.2}{0.09} = 213.33$$

$$Gnb_2 = \frac{20.8}{11.5} = 180.87$$

Since the sum of 213.33 and 180.87 is equal to 394.20, the risk compensating effect is now positive (5.8) and further reduces its weight to 1.5 per cent. The change in sign (negative to positive) depends on the change in the spreads of the two businesses. The spreads in the two businesses were respectively equal to 2.3 per cent and 1.5 per cent before the attribution of a portion of revenues to corporate, and before the identification of corporate assets. Following the attribution of revenues and assets, spreads change and become equal to 1.6 per cent in business 1 and 2.6 per cent in business 2. In fact, as regards business 1:

$$\frac{127.2}{1{,}200} = 10.6\%$$

$$Sp_1 = 10.6\% - 9\% = 1.6\%$$

and as regards business 2:

$$\frac{112.8}{800} = 14.1\%$$

$$Sp_2 = 14.1\% - 11.5\% = 2.6\%$$

The compensating effect therefore acts now in reverse with respect to what was previously hypothesized, since business 1 has become less favorable than business 2. The disaggregation of entity goodwill at this point takes on a new form. In fact, it is possible to say that:

$$Gn = Gnb_1 + Gnb_2 + Gnc = 192 + 208 + 100 = 500$$

Or, also including the risk compensating effect:

$$Gn = Gnb_1 + Gnb_2 + Gnc + RCE = 213.33 + 180.87 + 100 + 5.8 = 500$$

Extrapolating from the obtained results, first of all it should be reminded that corporate goodwill is equal to:

$$Gnc_0 = \sum_{s=1}^{\infty} \frac{[h_s - (ke\ U \times Ch_{s-1})]}{(1 + ke\ U)^s} \qquad [3.9]$$

in which:

h_s: corporate operating profit after tax in accounting period s;
keU: cost of unlevered equity computed in relation to the enterprise as a whole (entity);
Ch_s: operating capital invested in the corporate at end of period s.

Expressing it in a formula, the entity goodwill value, including the risk compensating effect, is equal to:

$$Gn = \sum_{r=1}^{m} Gnb_r + Gnc + RCE \qquad [3.10a]$$

$$Gn = \sum_{r=1}^{m} \sum_{s=1}^{\infty} \frac{[yb_{rs} - (keb_r U \times Cbr_{s-1})]}{(1 + keb_r U)^s} + \sum_{s=1}^{\infty} \frac{[h_s - (keU \times Ch_{s-1})]}{(1 + keU)^s} + \sum_{r=1}^{m} Sp_r \times C_r \times COM_r \qquad [3.10b]$$

THE ECONOMIC SIGNIFICANCE OF CORPORATE GOODWILL

The analysis made in the previous sections allows the identification, as regards multi-business enterprises, of several breakdown hypotheses.

- If all costs and capital can be significantly allocated to businesses, then the sum of business goodwill values will be equal to overall goodwill (except for RCE).

- In other situations, a company management may deem it more significant in goodwill breakdown to keep a few resources at a corporate level. In this case the following possibilities emerge:
  a) a corporate goodwill is not evaluated: business goodwill values increase and corporate resources (CC and CA) must be included in the breakdown process;
  b) a corporate goodwill is evaluated.

The choice of option a or b depends on how significant the corporate goodwill value is at an economic level as well as on how verifiable the necessary hypotheses for its calculation are. Regarding the first problem, economic significance of corporate goodwill, the considerations that can be made are well known. By breaking down the goodwill, the attempt is made to trace back the origin of expected above-normal earnings. If the resources utilized at a corporate level play in this respect a specific and determining role, even irrespective of the business areas where an enterprise works, in the sense that by modifying these areas the corporate resources continue in any case to give their contribution, then the corporate goodwill is significant. After all, it is known that the corporate level of strategic decisions may, depending on the case at hand, assume a very important role in the strategic project and therefore in the value generation process (Andrews 1980, Bowmann & Asch 1987, Porter 1987, Collins & Montgomery 1997). The following strategic choices are usually made at a corporate level:

- institutional organization, i.e., the form and the institutional mechanisms for the operation of the enterprise (legal form, dividend policy, minority management, provisions on the operation of the board of directors, policy of compensations and contributions for main stakeholders, relations between family and enterprise, etc.);
- competitive arenas in which an enterprise offering should be placed;
- vertical and horizontal integrations levels (combined with the same choices made at a business level);
- geographical areas where an enterprise should operate (also in this case, combined with the same choices made at a business level);
- utilization and development of an enterprise resources (including financial resources).

These strategic choices aim at achieving sustainable advantages over time (or at containing/reducing competitive disadvantages). For example, an advantage in relation to suppliers may consist of being engaged by several businesses (choice made at a corporate level), or the differentiation achieved in a given product may depend on the choices made at a corporate level on the development of enterprise resources. Certainly the intensity and the effectiveness by which corporate contributes to the creation of value does depend not only on the managerial quality but also and foremost on the nature of the

relations existing between corporate and business. In particular, results will differ according to the implemented influence model, which may be:

- stand-alone influence (corporate supports business units without developing or fostering relations among them);
- linkage influence (corporate develops and optimizes relations among business units);
- central function and service influence (corporate develops relations between business units and centralized units through centralization and control of functions);
- corporate development (corporate maximizes value through a specific portfolio strategy).

Especially in this last instance (corporate development), the decision made at a corporate level forms the basis of significant (market and operating) synergies between the various business areas, generated through the exploitation of tangible interrelations (e.g., the sharing of distribution resources) and intangible interrelations (usually, exploitation of knowledge and relational patrimony).

EVALUATION OF CORPORATE CONTRIBUTION

A second problem connected with the estimation of a corporate goodwill consists of the technical plausibility of the operation, that is, as shown when developing the numerical example, the possibility of determining a portion of revenues that can be attributed to corporate contribution (in the example, 20 per cent of revenues of business 1 and 10 per cent of revenues of business 2). A few meaningful indications in this respect can be drawn using the cost analysis tools discussed in the previous sections. The activity-based costing method, besides being suitable for the attribution of a few costs and assets to the business areas, may also be useful, so to say, in a reverse way, for the determination of corporate revenues. In this way:

1. identification of corporate activities (e.g., planning, communication, governance, etc.);
2. identification of process drivers and subsequent allocation of overhead costs and assets to specific corporate activities;
3. identification of activity drivers which allow the understanding the extent of the connection of corporate activities to businesses;
4. identification of portions of revenues that can be attributed to corporate, using the ratio between revenues and operating costs of each business area.

An example may help clarify the above steps. Let us assume that the corporate activities whose costs are not attributed to the business areas are corporate

management and planning. The allocation of costs to the two activities is made on the basis of the cost of human resources employed in the activities, resulting in a distribution of 70 per cent to corporate administration activity and 30 per cent to planning activity (total corporate costs, including amortization costs of corporate activities, were in the amount of 100). Regarding the corporate management activity, the activity driver is identified in the marketing costs related to the business areas (the higher these costs, the greater the absorption of the corporate management activity). Based on this, the corporate management costs connected to business 1, as a hypothesis, would be equal to 60, whereas those connected to business 2 would be equal to 10. As for planning, instead, a cost driver is identified in the variations between final balance and budget recorded in the previous year, i.e., the greater the difference of a business area from the other, the greater the attribution of corporate resources. Based on these parameters, total costs, in the amount of 30, are respectively attributed to business 1, in the amount of 20, and to business 2, in the amount of 10. In this way, business 1 is overall connected to corporate costs in the amount of 80 and business 2 to corporate costs in the amount of 20. It should be reiterated that in this case the objective is not the attribution of costs—an operation that it is not considered significant, even though it is feasible on a methodological level—but quite the contrary, i.e., the attribution of a portion of revenues to the contribution of corporate activities. Therefore, it is more correct to pinpoint the role that these resources play in the generation of goodwill at a corporate level rather than at a business level. Business 1 in fact shows a relation between revenues and costs of approximately 1.88 (790 divided by 420), whereas in business 2 such ratio is equal to 2.21. Applying these ratios to the values of 80 and 20, respectively, the following are obtained:

$$\text{business 1} = 80 \times 1.88 = 150.4$$

$$\text{business 2} = 20 \times 2.21 = 44.2$$

The amount of 150.4, in business 1, is equal to a little more than 19 per cent of overall revenues (790). The amount of 44.2 instead is equal to a little more than 10 per cent of revenues of business 2 (420). In this way, the two rounded percentages (20 per cent and 10 per cent) previously used to compute the portion of revenues attributed to the contribution of corporate activities (as an absolute value, rounding up leads from 194.6 to 200) can be identified.

***

An alternative valuation, which does not require the determination of corporate revenues, consists of the direct valuation of the synergies that are deemed to be generated by corporate, using a differential logic (Damodoran 2001). For example, in order to evaluate the synergies in a potential business combination we might want to proceed as follows:

1. stand-alone evaluation of the two companies, estimating their respective expected flows (with terminal value);
2. preparation of a joint plan of the two companies, by simply adding (and rectifying as least as possible) stand-alone flows;
3. evaluation of the combined firm based on the plan referred in item 2;
4. identification of possible synergies and expression of such synergies so as to allow correction/integration of the plan referred to in item 2;
5. new evaluation of the combined firm, based on the corrected plan (item 4);
6. the difference between the value obtained in item 5 and the value obtained in item 2 is the value of the synergies.

In brief, a differential analysis in evaluation processes consists of identifying a distinctive element and then proceeding to the evaluation with or without it. The resulting value is a good proxy of the value that one is trying to determine. Regarding this last evaluation option, a few considerations should be made. Let us keep in mind that the enterprise value (EV) is given by the sum of goodwill (G), equity (E), tax shield (V_{TS}) and debt(D),

$$EV = Gn + E + V_{TS} + D \qquad [3.11]$$

Using, for the sake of simplicity, the perpetual rent logic, the following results, as shown in Chapter 2:

$$EV = \frac{y - keU \times C}{keU} + E + (D \times t) + D$$

Now, it is possible to calculate the enterprise value without the effect of corporate synergies and attribute this difference to corporate goodwill. Therefore, given EV_q, the enterprise value without corporate synergies, the following results:

$$Gc = EV - EV_q \qquad [3.12]$$

The differences in value in fact due to corporate synergies can be related to:

- improved competitive position (prices, volumes, growth);
- economies of scale (reduced cost per unit);
- overall risk reduction;
- tax relief (overall tax reduction).

Looking at formula [3.11] it is fair to conclude that the four identified elements act in a differential way only on goodwill, unless specific hypotheses are introduced also regarding the net financial position and the equity.

IN BRIEF

In this chapter, the goodwill has been broken down into the various business goodwill values connected to the business areas in which an enterprise operates, as well as in corporate goodwill. The differences between the risk of enterprise as a whole and the risk of each single business moreover cause the emergence of a phenomenon that has been defined as risk compensating effect (RCE), which measures the effectiveness of the allocation of capital among the business areas, given their respective spreads and risk profiles. As shown, in selected instances it is possible to further break down the goodwill, isolating the role played by the resources employed at a corporate level in the value generation. In this way, it is possible to evaluate the corporate goodwill. Even though it has not been said in the examples, it is certainly possible to proceed by different combinations. For example, it is possible that all corporate costs be attributed to the business areas and that only specific assets remain within corporate. Figure3.4 shows a summary of the numerical examples given in the chapter, divided into three options:

- evaluation of business goodwill including in the business areas all corporate assets and costs;
- evaluation of business goodwill without including in them corporate investments and costs;
- evaluation of business goodwill and corporate goodwill.

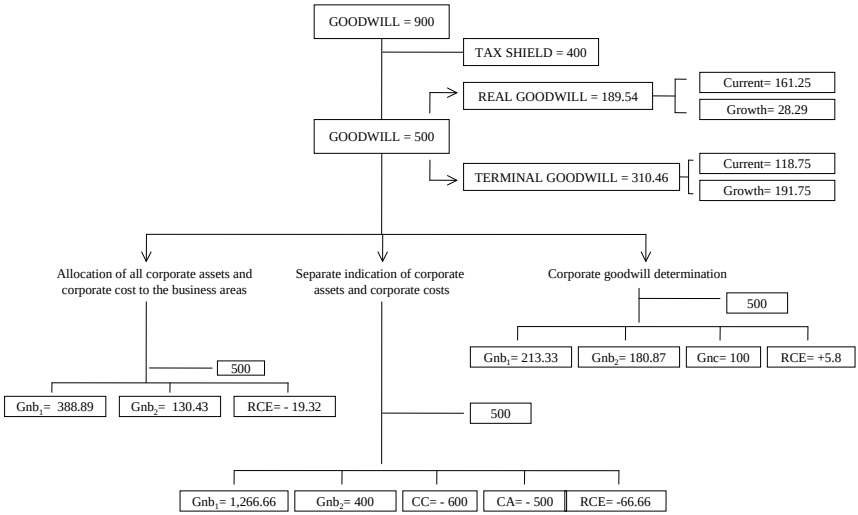


Figure 3.4 In brief.

4 Goodwill and Competitive Heterogeneity: System Goodwill, Positional Goodwill and Firm Capabilities

COMPETITION AND RENTS

In the previous chapter, we have introduced the concepts of business goodwill and corporate goodwill, which are basic elements in the breakdown process of overall internally generated goodwill. To continue the analysis and propose other breakdown methods, for both business and corporate goodwill, it is necessary to take a closer look at competitive dynamics, which so far have been treated only superficially. The goodwill phenomenon is directly connected to the abnormal earnings obtainable by the enterprises over periods of time that can also be very long (Chapter 1). According to the economic theory, profit consists of the share of revenue that results after all productive factors have been remunerated at market prices, i.e., according to their opportunity cost, risk capital included. The opportunity cost can be defined as the least consideration that each provider of resources expects to receive from an enterprise for its contribution. Assuming, for the sake of theoretical simplicity, that an enterprise remunerates at market conditions all resources that have been acquired subject to a contractual obligation (i.e., according to their opportunity cost), including debt capital, the issue of economic profit would boil down to measuring the return on equity. A normal return on risk capital depends on the level of risk that can be associated with its use. In other words, the cost of equity is equal to the return expected from the investors, given that their expectations form on the basis of the risk taken on with the investment, that is, based on the uncertainty that characterizes future expectations. All in all, according to standard operating criteria, the calculation of abnormal earnings basically consists of comparing the actual return on capital with the return considered normal, given specific risk conditions: economic profit and, consequently, goodwill depend on the relevance of the spread between profitability and cost.[1]

The study of the phenomena underlying a greater remuneration capability of an enterprise has traditionally characterized a large portion of microeconomic research. In fact, the traditional concept of rent stands for an abnormal earning that (Rumelt 1984):[2]

- is obtained as a result of owning a given resource or group of resources;
- does not attract new production in the competitive system as an effect of entry barriers.

Furthermore, it is possible to identify different kinds of rents:

- monopolistic rent, which results from a favorable market position able to protect an enterprise from competitive mechanisms such as the arrival of new competitors or technological innovation;
- Ricardian or differential rent, which originates from the ownership of particularly scarce resources and lasts over time;
- Schumpeterian or entrepreneurial rent, which is the result of an innovation and, due to imitation processes, lasts for shorter periods of time with respect to Ricardian rent.

In the last decades, studies on company strategies have contributed to fine-tune the knowledge of these phenomena. Much has been clarified on the origin of competitive heterogeneity and subsequent competitive positions achieved by enterprises. The purpose of this chapter is to expand the breakdown process, introducing additional analysis methods regarding business and corporate goodwill. In particular:

1. business goodwill values will be broken down into system business goodwill and positional business goodwill;
2. business goodwill values—both system and positional—and corporate goodwill will be broken down based on the critical resources from which competitive advantages are deemed to originate.

In order to achieve these objectives, it is first necessary to deepen the key concept of competitive heterogeneity and the methods through which this heterogeneity reflects on returns and enterprise risk.

THE ORIGIN OF ABNORMAL EARNINGS: INDUSTRY STRUCTURE AND COMPETITIVE POSITION

The studies on competitive positioning, mainly developed by strategic management, have greatly contributed to the deepening of the knowledge of the phenomena originating abnormal earnings. Two research fields have been especially fruitful: structural positioning and resource-based studies. We will briefly describe both of them below. Structural positioning models are so defined because they originate from industrial economy and in particular from the Structure-Conduct-Performance paradigm. The structuralistic paradigm was first developed by Edward Mason at

Harvard in the thirties and later, in the forties and fifties, by Joe Bain at Berkeley. This paradigm investigates the relations between the structures of industrial sectors (level of fixed costs, product differentiation degree, entry barriers, and so on), the behaviors of enterprises (price and communication policies, investments in research and development, policies of cooperation between competitors, etc.) and finally the general performance achieved by the system, in terms of allocative efficiency. Particularly noteworthy are the results of Bain's work on the relation that exists between the level of concentration of the sector and the average profit achieved by enterprises (Bain 1951), as well as, and most of all, on entry barriers and on how these, according to the structure of the competitive industry, create rents of a monopolistic kind. The analytical evolution towards company strategy has brought about significant changes in the objectives and the logic of structural analysis; i.e., the focus has shifted from the wellbeing of consumers, and from the most effective competitive policies to secure it, to the level of profitability achieved by the enterprises and to the way in which these deal with and contain competition. In both study fields, a key concept is in fact the access barriers which contain competitive intensity. Barriers are basically composed of costs which burden newcomers and not incumbents, who therefore benefit from rents that do not attract new entries in the competitive system (Stigler 1968). An industrial industry devoid of access barriers would be perfectly contestable when (Baumol et al. 1982):

- prospective members may have access to the same technology and serve the same market at the same conditions as incumbent enterprises;
- prospective members assess convenience of entry at the prices applied by incumbent enterprises.

In the shift from the theories on industrial organization to their application to enterprise strategy, the contributions of both Caves and Porter, and then Porter alone, have played a fundamental role. In an article published in 1977, Caves and Porter develop Bain's theory, basically along two directions (Caves & Porter 1977). First of all, the enterprises working in a competitive industry, just like prospective newcomers, are decisional subjects that make investments of various kinds based on predictions on future trends of achievable results. Such decisions and investments have obviously an effect on the configuration and on the level of entry barriers. In other words, the barriers that can usually be observed in the industries are in part of a structural kind (just like those described by Bain) and in part however also of an endogenous kind; that is, they are the result of enterprises behaviors.

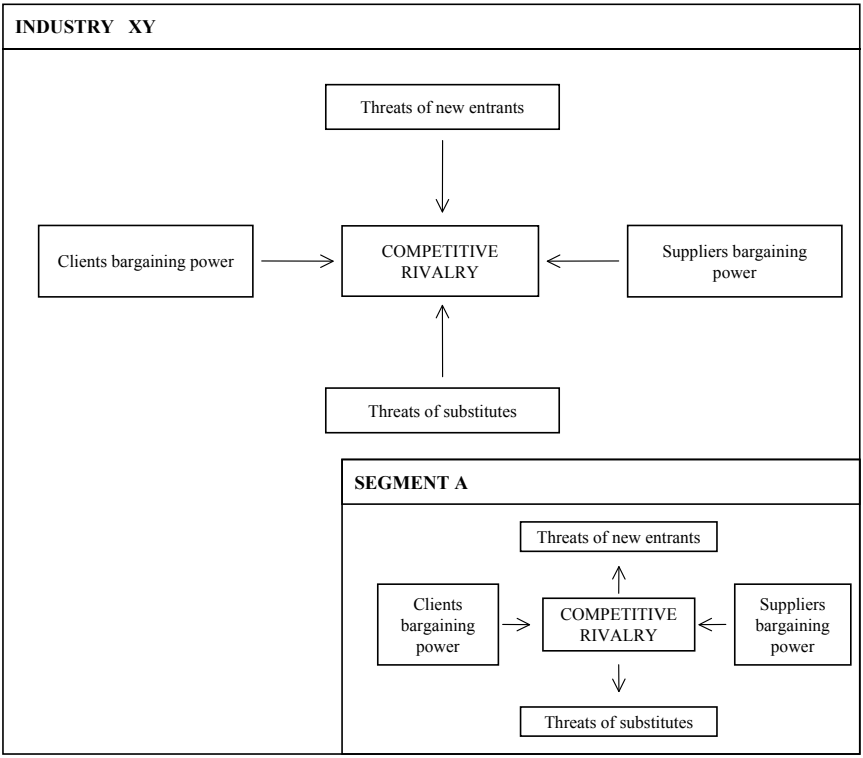
Secondly, the concept of entry barriers applies to those enterprises that are still absent in the competitive arena (zero output). Caves and Porter wish instead to produce a more general theory of enterprise mobility

that is not limited to newcomers only but extends to the enterprises that already work in the industry or move from a competition segment (or strategic grouping) to another segment. A shift is thus experienced—as the title of the article suggests—from entry barriers to mobility barriers. The barriers to mobility are mismatches between enterprises working in the same industry, which are attributable not only to the company size—the only differential element considered by the traditional approach—but also to other relevant aspects, such as for example specialization, marketing mix, product quality and so on. The shift from entry barriers to mobility barriers explains the reason why in the same sector, even same-size enterprises may reveal extremely varied profit profiles. Just as the entry barriers explain why competitive mechanisms do not annul rent positions, in a similar way the mobility barriers may explain the reason why in the same industry some enterprises, positioned in particularly favorable market zones, continue to obtain significant economic profits. Further developments, thanks in particular to Porter's works published in the eighties and nineties, basically see the profitability of an enterprise as a result of two phenomena:

1. attractiveness of the industry where an enterprise works (or, more specifically, attractiveness of the selected industria segment);
2. relative effectiveness of competitive positioning within the industry or segment (Rumelt 1991).

Since both elements can be modified by the enterprises, even if at different times and in different ways, both become the privileged object of strategic choices. Regarding the first aspect, structural attractiveness, Porter recommends the use of the highly simplified although effective analysis method which is based on the nature of the five competitive forces (Figure 4.1):

1. intensity of competition between direct competitor: such intensity depends on many variables and manifests itself especially in the number of competitors existing in the competitive arena;
2. contractual force of customers, which, if high, restricts the leeway of enterprises operating in the system;
3. contractual force of suppliers, in which the same as for customers applies;
4. likelihood of arrival of newcomers, who might significantly modify the intensity and the nature of competition;
5. replacement products and services, i.e., offering systems that even though they do not belong to the competitive system may be used by buyers as a replacement.



Adapted from Porter M.E., *Competitive Strategy – Techniques for Analyzing Industries and Competitors*, New York, The Free Press,1980.

Figure 4.1 Industry/segment five competitive forces. (Adapted from M. E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York: The Free Press,* 1980.)

A critical aspect is the identification of segments. The structural analysis in fact, as shown in Figure 4.1, can be also carried out at a lower level, namely, the segment level. In very general terms, the segmentation of the industry occurs on the basis of a few dimensions that can be combined in different ways in a segmentation matrix: differences among types of customers, variety of products/services, various distribution channels, geographical location of buyers (Porter 1985). The methods for defining a business area, which have been described in Chapter 3, represent a more sophisticated form of segmentation, basically for two reasons:

- in the determination of competitive dynamics, the centrality of the need (or intended use) emerges in a clearer way;
- since technology is a variable as well, the possible transversality of the strategic area in comparison to the industry emerges more clearly.

In any case, with respect to the industry, both the business area and the industrial segment serve to identify the competitive space where the competition between enterprises actually occurs. In some instances, the industry, intended in the traditional sense, identifies with fair accuracy the competitive space (increasingly more rarely). In other cases, it is instead necessary to go on a more analytical level.

The trend of some structural determinants defines the nature of these forces for each competitive system, whether be it the industry, segment or business (life cycle, technology, fixed costs, fragmentation of potential markets, economies of scale and experiences, etc.). Since this very nature directly affects product and service prices, production and sale costs as well as the investments necessary to operate in the competitive system, the configuration of the five forces ultimately determines, along with its dimension and growth rate, the average profitability of a competitive system. Hence, profitability or attractiveness of competitive systems is not homogeneous and changes over time. In particular, in some competitive systems the average profitability results higher than the capital cost, whereas in other systems quite the opposite occurs. This implies—as better described further down—the existence of competitive spaces in which positive spreads (economic profit) or negative spreads form on the average. Over the long term, a system spread will cancel out only as long as the entry barriers are overcome by newcomers who lower average profitability or increase risk level.

The second phenomenon underlying profitability is the relative position of an enterprise with respect to competitors in the relevant competitive space. The level of profitability of an enterprise depends on such position, rather than on the industry average or on the segment average. In Porter's elaboration, positioning can generate cost advantages or differentiation advantages and can be extended to the entire industry (or to several industrial segments) or to a single segment (focusing on costs or focusing on differentiation). In Porter's analysis, the cost position of an enterprise depends on (Porter 1985):

- the way in which activities are carried out in comparison to how they are carried out by competitors;
- the relation between the methods for performing the activities and cost structural determinants (economies of scale, learning, production capacity utilization model, etc.).

In a similar way, the differentiation position of an enterprise depends on:

- the way in which the activities are carried out in comparison to how they are carried out by competitors;
- the relation between the activities and the determinants of uniqueness (connections, time factor, geographic position, scale factor, etc.).

In conclusion, the analysis of competitiveness and profitability using the structuralistic approach can be summarized in the following three steps.

1. The structure of an industry influences the profitability of all enterprises that work in it and determines the average profitability of the industry.
2. Within the industry, however, some enterprises may focus on specific segments, whose structure may appear different (more or less favorable) from the structure of the industry. The mobility barriers protect the position over time if it is favorable. The same applies if the business concept is used instead of the industrial segment.
3. Finally, the ability of an enterprise to choose and realize a cost or differentiation strategy is decisive, which will result in a higher profitability for the enterprise with respect to other enterprises of the industry, if not focused, or of the industrial segment (or several segments), if focused.

COMPETITIVE HETEROGENEITY AND RESOURCE-BASED VIEW (RBV)

Scholars of the Resource-Based View (RBV) interpret somehow differently the phenomenon of competition and profitability as they shift the focus from the structural dynamics of the competitive system, be it the industry, segment or business, to the methods by which the enterprises generate, acquire and develop their own internal resources. Usually, these studies harshly criticize the structuralistic approach, which they consider frozen and unable to grasp the importance of evolution phenomena (Teece 2007). In the last few years, however, a new view has emerged, which is more inclined to shed light on the advantages afforded by an integration of the two approaches. As a matter of fact, each of them seems to be effective in explaining different phases in the competitive dynamics. The resource-based view is more inclined towards discontinuance and Schumpeter's innovation, whereas the structuralistic approach is more oriented towards inertial competitiveness.

The origins of the resource-based view are to be found in the works of Edith Penrose on enterprise growth processes (Penrose 1959). Based on a vision of enterprises as a group of resources, Penrose attributes the growth phenomenon to the methods by which top managements acquire scarce resources and the methods by which these are used to develop new opportunities. In particular, Penrose identifies three key elements:

1. the ability to recognize development opportunities that can be drawn from ownership of available resources;

2. the ability to combine available resources with new resources that can be acquired;
3. the willingness to accept the risks inherent in the use of new combinations of resources for the development of new opportunities.

Later on, studies on isolation mechanisms of enterprises proved fruitful. This very aspect does not significantly diverge from the analyses carried out by Caves and Porter on barriers to mobility (Rumelt 1994). The existence of isolation mechanisms which restrain long-term readjustment of rents among enterprises, can be related, in the broadest sense of the word, to the fact that imitation processes on the part of competitors occur in structural conditions of uncertainty. Isolation mechanisms are strictly connected to change processes in competitive conditions, regarding technology, consumers' preferences, regulations, etc.

Despite the importance of these contributions, the birth of the RBV approach is conventionally attributed to the article by Wernerfelt (1984), in which, among other things, the concept of competitive barriers posed by available resources was significantly developed. According to Wernerfelt, in fact, these barriers generate when the experience gained in the use of certain resources reduces costs for active competitors and increases costs for prospective newcomers (Wernerfelt 1984). These resources are subject to the typical effects of experience curves and are defined attractive, since they can generate abnormal earnings. In the ensuing and accelerated production of countless contributions to this research current, it is worth mentioning, due to the deep influence that it exerted on the strategic field, the contribution given by Barney, who relates in a very effective manner the birth and maintenance over time of competitive advantages to the availability and use of company resources (Barney 1991). First of all, Barney uses a very ample definition of resource, which includes tangible, intangible and financial resources. These resources, for reasons that are easily understandable, cannot generate competitive advantages that are sustainable over time if they are basically homogeneous and transferable from a competitor to another. Therefore, they have to display a few fundamental characteristics:

- they should be usable for strategic purposes; i.e., they should allow grasping of opportunities or driving back of competitive threats;
- they should be rare, not in the general sense usually intended by the economic theory, but in the sense that the number of competitors (actual or potential) owning them should be little;
- they should not be imitable by competitors (or imitable in an imperfect manner);
- they should not be substituted by surrogate resources.

The originating factors of these characteristics in company resources can be plentiful and can explain the reasons for their poor mobility and transferability:

- the existence of formal mechanisms for the legal protection of ownership and use of resources;
- the level of 'causal ambiguity' is the difficulty in comprehending from the outside the relations between the value of knowledge and competitive advantage: this is a form of protection that can be considered the exact opposite of the first one although it is equally, if not more, effective;
- the level of stability of alliances with other enterprises, which at certain conditions may prove to be a source of competitive advantages;
- the level of idiosyncrasy of resources, which makes the information and knowledge wealth scarcely mobile or transferable: this characteristic in principle depends on the specific method by which the resources are created or acquired (uniqueness of time and space conditions);
- the time needed by competitors to activate imitation mechanisms, in the sense that the greater this time span, the higher the number of opportunities given to the first mover to strengthen its dominance position and protect its resource patrimony.

The studies on resource-based positioning also include research currents that started at a later development phase. If, on one hand, they display a few interesting specific features, on the other hand they keep a well-apparent connection with the key role of resources in the determination of enterprise competitive positioning. We are making reference in particular to the studies on dynamic capabilities and on competences whose origins and objectives are different from one another. The approach of dynamic capabilities, led by authors such as for instance Nelson and Winter, Teece, Amit and Schoemaker, is of a new Schumpeterian kind and it is very close to evolutionist and behavioral enterprise theories. The competence-driven perspective instead is conceived with the purpose of integrating the concept of resource with that of capability and enhancing the prescriptive implications of the resource-based approach through concepts, models and tools that can be used at a managerial level (Sanchez 2001). Some of the scholars in this field among others are Hamel and Prahalad, Rumelt, and Sanchez. Indeed, the indiscriminate use of dynamic capabilities on one hand and competences on the other has generated a fair amount of confusion which however is more linguistic than conceptual. Therefore, resorting to the general concept of capability (which also includes competences) the most important elements of these studies can be more easily examined. Capabilities are

the whole of applied knowledge that allows an enterprise to carry out the transformation processes necessary to elaborate a competitive offering system (Amit & Shoemaker 1993). Relating them in a more specific manner to enterprise resources, capabilities are developed by enterprises in the creation, acquisition and use of company resources. It is fair to say that capabilities are resources that make any other resource in the economy of an enterprise productive and goal-driven. They are a flow of information and knowledge that mobilizes the stock of all other resources towards production purposes (Zott 2003). It is common practice to draw a distinction between basic capabilities and dynamic, or distinctive, capabilities.

The former are of an operating kind and are necessary to carry out economic/technical processes of an enterprise. For this reason, these capabilities are displayed by all competitors, which however may exercise them in different ways. Therefore, their impact on competitive differentials and generation of value varies. In other words, even these capabilities may be at the heart of abnormal earnings, even though usually for a limited period of time. Dynamic capabilities play a different role within an enterprise. They do not concern technical operativeness, typical of basic capabilities, but the attitude towards innovation and competitive development (in this sense, they are defined dynamic). If basic capabilities guarantee continuity of company processes, dynamic capabilities allow enterprises or, at least, a certain number of enterprises to cope with discontinuity and become instead originators. For analytical purposes, dynamic capabilities may be disaggregated into three components (Teece 2007). These are:

- ability to learn and interpret, in order to make sense of all possible competitive opportunities (obviously, before other people do);
- ability to translate intuitions into well-structured business models (see next section), able to take the best advantage of the benefits afforded by innovation;
- ability to combine and reconfigure all resources, both tangible and intangible, in order to constantly keep the enterprise open to evolutionary processes.

Dynamic capabilities are most difficult to define and therefore to create or acquire. However, for this very reason, it is more likely that they may display the characteristics that are useful for the generation of advantageous positions, even for long periods of time. In brief, it is the enterprises displaying these capabilities that innovate and dictate rules and times of competitive dynamic.

Basic and dynamic capabilities are the cumulative result of firm behaviour and expenditures over a period of time: they are the basic asset stocks, accumulated by choosing patterns of resource flows (Dierickx & Cool 1989).

ENTERPRISE PROFITABILITY AND STRATEGIC CHOICES AT A BUSINESS LEVEL

Looking at the structuralistic and resource-based research currents, it is fair to say that the profitability of an enterprise is the result of a number of phenomena.

- First of all it depends on a structural profitability of the competitive system where an enterprise operates (to be intended as a business having the same extension as an industry, or a segment of it, or as an overlap of different segments belonging to different industrial sectors). Such structural profitability is certainly the result of many phenomena, which however are largely due to the enterprise strategic choices.
- Secondly, it depends on the relative position achieved in the face of competitors. These positions assume the form of cost or differentiation advantages and have a variable extension.
- The results that the enterprises obtain in the modification or exploitation of the structural conditions of the competitive system, as well as in the relative position, depend on the resources available to them, and in particular on basic and dynamic capabilities.

The analysis of competitive heterogeneity, interpreted through the two approaches, also contributes to clarify which strategic decisions enterprises make at a business level, a particularly relevant aspect for the purpose of a full understanding of business goodwill. To better define the nature of such decisions, the Porterian approach proves more effective, even though one should always bear in mind the relevance of resources and capabilities in the determination of the basic conditions within which these decisions are made, as well as the possibility to operatively carry them out. Therefore, in analytical terms, a business strategy comprises the following main phases.

1. The structure of the competitive space is first analyzed. To make it simple, the structural analysis may be carried out with reference to the five Porterian forces (competitors, clients, suppliers, prospective newcomers, substitute manufacturers). The level of attractiveness of the competitive space will emerge from this first analysis.
2. In the second phase, the competitive position of an enterprise is evaluated with respect to such forces (real and potential); i.e., its strengths and weaknesses are assessed. In other words, the position of an enterprise is assessed with respect to enjoyed or sustained competitive advantages.
3. Finally, in the light of the first two phases, a specific strategy is selected for each competitive space (business model), which should lead within the set time to a new target position. Given that the determination of

Table 4.1 Return on Equity and Capital—by Industry

Industry name	*Number of firms*	*ROC*	*ROE*
Advertising	36	12.99%	9.50%
Aerospace / Defence	73	13.76%	12.74%
Air transport	56	38.40%	35.17%
Apparel	64	15.67%	12.41%
Auto & Truck	31	11.04%	11.51%
Auto Parts	64	17.56%	–1.66%
Bank	550	-	13.56%
Bank (Canadian)	7	-	18.68%
Bank (Foreign)	4	-	-
Bank (Midwest)	37	-	17.63%
Beverage (Alcoholic)	27	14.41%	20.17%
Beverage (Soft drink)	21	22.45%	26.74%
Biotechnology	105	14.15%	7.34%
Building Materials	47	139.62%	–100.77%
Cable TV	23	10.34%	1.69%
Canadian Energy	14	23.10%	21.41%
Cement & Aggregates	13	16.97%	18.90%
Chemical (Basic)	24	20.11%	22.78%
Chemical (Diversified)	36	24.06%	19.45%
Chemical (Specialty)	94	18.43%	12.30%
Coal	16	27.48%	22.66%
Computer Software /Svcs	425	34.78%	18.02%
Computers/Peripherals	148	30.52%	16.63%
Diversified Co.	134	15.11%	14.10%
Drug	334	23.56%	17.37%
E-commerce	60	28.03%	8.71%
Educational Services	37	36.96%	19.53%
Electric Util. (Central)	24	11.20%	12.98%
Electric Utility (East)	29	11.32%	11.79%
Electric utility (West)	16	12.24%	10.99%
Electrical Equipment	94	18.17%	16.33%
Electronics	186	13.96%	6.13%
Entertainment	101	9.43%	6.67%
Entertainment Tech	31	1.22%	–4.34%
Environmental	96	12.07%	9.50%
Financial Svcs (Div)	269	-	15.34%
Food Processing	123	16.74%	19.35%
Food Wholesalers	21	15.73%	14.47%
Foreign Electronics	10	11.88%	5.78%
Furn / Home Furnishings	38	14.03%	13.18%
Grocery	19	16.91%	11.15%
Healthcare Information	34	20.98%	6.39%
Home Appliance	14	27.79%	19.92%
Homebuilding	41	14.43%	24.72%
Hotel/Gaming	84	10.04%	11.01%
Household Products	31	15.18%	17.77%
Human Resources	35	16.81%	11.37%
Industrial Services	230	14.86%	10.93%
Information Services	41	20.03%	16.00%
Insurance (Lifie)	40	-	11.20%
Insurance (Prop/Cas)	97	-	6.70%
Internet	329	-	9.37%

(continued)

Table 4.1 (continued)

Industry name	*Number of firms*	*ROC*	*ROE*
Investment Co.	20	2.87%	-17.23%
Investment Co.(Foreign)	15	5.45%	4.86%
Machinery	139	14.87%	15.81%
Manuf.Housing /RV	19	9.25%	3.15%
Maritime	46	15.73%	19.00%
Medical Services	186	19.74%	12.20%
Medical supplies	279	25.40%	19.43%
Metal Fabricating	37	16.98%	16.54%
Metals & mining (Div.)	82	26.39%	28.16%
Natural Gas (Distrib)	30	10.81%	10.11%
Natural Gas (Div)	34	14.17%	15.86%
Newspaper	18	10.95%	12.82%
Office Equip/Supplies	26	15.27%	15.10%
Oilfield Svcs/Equip.	110	18.18%	14.55%
Packaging & Container	36	13.79%	10.87%
Paper/Fprest Products	42	13.39%	7.26%
Petroleum (Integrated)	30	26.43%	24.14%
Petroleum (Producing)	178	24.58%	17.56%
Pharmacy Services	20	14.65%	12.64%
Power	41	9.78%	-11.65%
Precious Metals	67	11.52%	2.30%
Precision Instrument	104	22.95%	10.83%
Publishing	50	16.50%	15.42%
R.E.I.T.	143	7.83%	9.76%
Railroad	20	12.66%	11.49%
Recreation	84	16.44%	14.09%
Restaurant	81	20.90%	17.99%
Retail (Special Lines)	164	27.06%	16.59%
Retail Automotive	15	13.99%	15.64%
Retail Building Supply	9	21.80%	20.80%
Retail Store	51	15.58%	16.26%
Securities Brokerage	32	18.06%	16.35%
Semiconductor	124	33.25%	14.33%
Semiconductor equip	14	24.14%	10.51%
Shoe	24	29.04%	20.31%
Steel (General)	30	27.08%	25.10%
Steel (Integrated)	16	28.795	24.27%
Telecom Equipment	136	36.09%	16.83%
Telecom Services	173	16.11%	5.43%
Thrift	248	-	10.34%
Tire & Rubber	10	18.45%	15.21%
Tobacco	11	26.08%	29.83%
Toiletries/Cosmetics	21	23.32%	27.77%
Trucking	38	18.68%	16.40%
Utility (Foreign)	6	10.96%	10.32%
Water Utility	16	10.48%	9.34%
Wireless Networking	73	10.55%	-0.26%
Other	1	-	-
Market	**7661**	**17.05%**	**14.64%**

Source: A. Damoradan, Return on Capital, Return on Invested Capital (ROIC) and Return on Equity (ROE): Measurement and Implications (New York: New York University, Stern School of Business, 2007).

the business area implies, in and of itself, the definition, or choice, of a combination of needs, clients and technologies, and therefore also a possible focus on specific segments, it is fair to say that the strategy at a business level is made of the following additional choices (concurrent and out of order):

- the reference geographical area, more or less wide;
- the level of vertical integration, which oftentimes is however part of a different, corporate-related strategic level;
- the value proposition, which depends on the way in which the characteristics of the offer and the related price combine together: it determines the value generated for the client and therefore it boils down to choosing between a cost strategy and a differentiation strategy (with or without focalization).

Certainly, opting for the best possible position, given the competitive structure, the strength and the weakness of the enterprise, and the expectations in terms of threats and opportunities, does not exclude the possibility for the enterprise to follow more complex strategic paths aiming at (Porter 1996):

- influencing the strength relations between the various actors in the competition;
- predicting or determining the structural evolution of the competitive space, usually acting on the technology.

PROFITABILITY AND RISK OF COMPETITIVE SYSTEM AND ENTERPRISE

Profitability and risk are certainly enterprise properties. However, with a fair amount of abstraction, they may also be extended to competitive systems.

It is easy to show that the average profitability varies across industry: according to Koller et al. (Koller et al. 2005) the differences in returns across industries has widened over the last few decades. Barriers to entry and life cycle seem to be the most important reasons for these differences (Table 4.1) The analysis however is more complex as regards the risk. As previously and partly stated in Chapter 2, the many causes of enterprise risk develop on the basis of three factors:

- scenario factors, which regard the structural evolutions of technology, legislation, social inclinations and so on;
- competitive factors, which regard in particular the structure and the evolution of the specific competitive areas where an enterprise works oftentimes determined by cyclical phenomena;

- enterprise-specific factors, which regard typical phenomena such as for example the relationship with suppliers or the life phase of the enterprise: these can in turn be divided into operating factors, which depend on the content of the activity being evaluated, and financial factors, relative to the combination of owned assets and indebtedness as well as debt structure.

It is important to understand how these risk factors operatively contribute to the determination of the capital cost. Let us take into consideration the CAPM (Capital Asset Pricing Model), a single-factor method described in Chapter 2, since it is the most widely used approach. At least in the intent, the risk premium includes:

- general scenario-related factors, which should be measured by the market risk Rm, or rather, by the difference between Rm and Rf (risk free);
- factors related to the specific strategic area, as well as factors that are connected to the operating and financial peculiarity of the enterprise, which are all measured by the β value that, since it depends on the volatility of company results, is connected to variability of revenues, variability of operating profit as revenues vary (intensity of operating lever) and variability of net profit in relation to volatility of operating profit (intensity of financial lever).

Therefore, several thresholds of return on capital converge in the value of capital cost ke:

1. return on risk-free activities (Rf);
2. premium for the general risk of the stock market (Rm);
3. premium for the business risk (which can be measured, with a fair amount of approximation, by a sector-specific β value);
4. premium for the operating and financial risk of each single enterprise, which can be measured by an unlevered and a levered β value.

Analyzing the relationship between the industry-specific beta value and the beta value of each single enterprise, it is possible to understand the relationship between the risk of the competitive system and the enterprise risk. The beta value is a regression coefficient of a share yield in comparison to general market yields. Industry-specific beta values are average values calculated using a representative sample of stocks. The problems associated with the selection of this sample are well known. In particular, the selected enterprises should exclusively or at least largely operate in the competitive system being analyzed, since otherwise the system beta value would be polluted by risks that are associated with other systems. For the purpose of this contribution, the criterion to be adopted in the selection of a sample should not be the maximization of a generic comparability of the selected enterprises with the enterprise being evaluated, but rather their representativity

with respect to certain risk conditions typical of the competitive system. In any case, once the enterprises have been selected, it is possible to go ahead with the determination of the system beta value in the following way:

- determination of beta values of selected enterprises;
- calculation of unlevered beta values;
- calculation of average of unlevered beta values, usually weighted based on the capitalization of each company.

In the light of the above considerations, it is fair to conclude that in determining a business goodwill value, four variables seem to assume a relevant role:

1. operating profitability of the enterprise (at the level of each single business);
2. enterprise risk (unlevered at business level);
3. average operating profitability of the specific business;
4. operating risk of the business, which from now on, for the sake of simplicity, will correspond to the industry (so that sector-specific beta values can be used).

Let us take a look at the chart in Figure 4.2, showing the relationship between the identified variables.

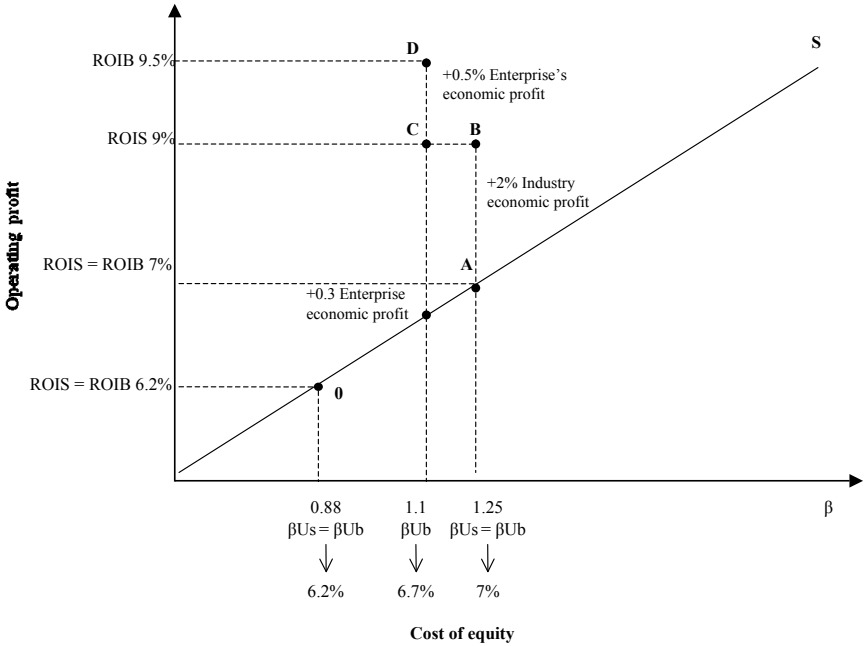


Figure 4.2 Business and enterprise: risk and profitability.

On the horizontal axis, let the risk measurement be represented by means of enterprise and industry beta values, keeping constant the Rm and Rf values. On the vertical axis, let the measurement of operating profitability be indicated (enterprise and sector values).[3] Let us assume that the average profitability of the business is equal to the average risk of the business and that moreover profitability and risk of the enterprise are equal to the profitability and risk of the industry. Both industry and enterprise economic profits are equal to zero. The S line shows profitability-risk combinations that leave at zero enterprise and business economic profits. Let us now work on real values:

Rf = 4.5%

Rm = 6.5%

βUs_r = business area r $\beta = 0.88$

βUb_r = enterprise's β (in business r) = 0.88.

Based on these data, the capital cost is equal to 6.2 per cent with a risk premium of approximately 1.7 per cent.

$$keU = Rf + \beta U(Rm - Rf)$$

$$0.062 = 0.045 + 0.88(0.065 - 0.045)$$

If we assume an operating profitability of the enterprise (ROIB) and an average industry profitability (ROIS) of 6.2 per cent, we can locate point O on the S line. Let us now assume as a first variation an increase in the average industry profitability, which is tallied by an increase in the βUs_r so that the industry-specific economic profitability remains unvaried, i.e., equal to 0. Let us assume therefore that the average profitability is raised to 7 per cent and the industry β from 0.88 to 1.25.[4] At point A, the enterprise and industry economic profit continues to be equal to 0. If, keeping industry and enterprise betas unvaried, the average industry profitability were equal to 9 per cent, an industry-specific economic profit would result, measured by a positive spread of 2 percentage points (point B).

Let us now assume that the operating profitability of the enterprise is in line with the average (9 per cent) and that the enterprise beta is lower than the beta that can be applied on average in the industry (1.1), consequently, with a risk level of 6.7 per cent (instead of 7 per cent). In this case, point C in the chart indicates for the enterprise a positive spread of 2.3 per cent. This spread incorporates an industry-specific economic profit (2 percentage points) and also evidences an enterprise economic profit of 0.3 per cent resulting from a more favorable risk condition (beta). Let us finally assume that the enterprise operating profitability increases and becomes equal to 9.5 per cent (point D). Other things being equal, the spread for the enterprise increases by 0.5 percentage points, thus determining a total spread of 2.8 per cent (9.5%–6.7%). Expanding on this last instance, the following information can be easily inferred reading the Figure 4.3:

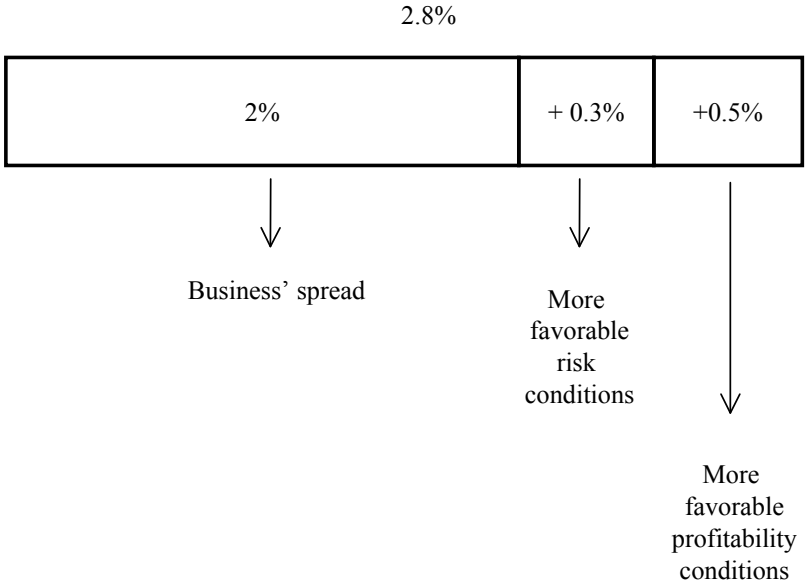


Figure 4.3 Enterprise's spread.

1. the economic profit of the enterprise is measured by the difference between operating profitability and enterprise operating risk of 2.8 per cent;
2. 2 per cent of this is attributable to the industry, or business, economic profit;
3. 0.3 per cent is attributable to enterprise risk conditions that are more favorable than sector average conditions;
4. 0.5 per cent is attributable to profitability conditions that are more favorable than industry conditions.

In essence, this simulation shows that the economic profit of an enterprise, making reference for now only to business areas, may be the result of a combination of factors.

1. It might be a profit of the competitive system, plausibly generated by most enterprises operating in the system and resulting from average profitability conditions that are more favorable than industry-specific operating risk conditions.
2. With respect to the economic profit of competitive system, an enterprise may even enjoy additional favorable conditions, attributable to a combination of higher profitability and lower operating risk with respect to the average conditions of the industry.

The matrix in Figure 4.4 graphically shows a summary of the various logical possibilities that we might encounter when comparing the enterprise profit (EPB) with the average profit of the competitive system (EPS).

	EPS < 0	EPS = 0	EPS > 0
EPB > EPS	**1A** EPB>0 ΔP/Δβ favorable	**2** EPB>0 ΔP/Δβ favorable	**3** EPB>0 Including positive EPS ΔP/Δβ favorable
	1B EPB<0 ΔP/Δβ favorable		
EPB = EPS	**4** EPB<0 ΔP/Δβ = 0	**5** EPB=0 ΔP/Δβ = 0	**6** EPB>0 ΔP/Δβ = 0
EPB < EPS	**7** EPB<0 Including negative EPS ΔP/Δβ unfavorable	**8A** EPB<0 ΔP/Δβ unfavorable	**9A** EPB>0 ΔP/Δβ unfavorable
			9B EPB<0 ΔP/Δβ unfavorable

EPS : industry economic profit
EPB: enterprise economic profit
ΔP: differential enterprise operating profit/ average industry profit (favorable / unfavorable)
Δ β: differential enterprise β / industry β (favorable / unfavorable)

Figure 4.4 Enterprise and industry: basic relationship (1).

The expression $\Delta P / \Delta \beta$ indicates a mix of enterprise profitability and risk of a favorable or unfavorable kind with respect to the profitability and risk conditions of the competitive system. More precisely:

> ΔP = difference between the operating profitability of the enterprise with respect to the average profitability of the industry (more or less favorable):
>
> $\Delta \beta$ = difference between the beta of the enterprise with respect to the industry beta (more or less favorable).

It is clear that each box of the matrix identifies reference basic conditions, in any case related to specific competitive situations. In particular, the cases where the enterprise profit is greater than zero display the following characteristics (boxes 1a, 2, 3, 6, 9a):

1. competitive systems with industry-specific profits that are negative or equal to 0, therefore significantly exploiting favorable risk and/or profitability conditions (boxes 1a and 2);

2. they generate within competitive systems with positive industry-specific profits, exclusively exploiting abnormal earnings of the system (box 6) or adding to this other abnormal earnings resulting from favorable operating profitability and risk conditions (box 3);
3. they generate within competitive systems with positive industry-specific profits, in relation to which they remain however lower due to specific operating profitability and risk conditions that are more unfavorable than industry-specific conditions (box 9a).

Finally, with regard to the various combinations of $\Delta P / \Delta\beta$, and starting from the central area D in the matrix shown in Figure 4.5, where $\Delta P / \Delta\beta$ are close to zero, i.e., with enterprise results in line with the competitive system, the following three areas can be identified in the matrix:

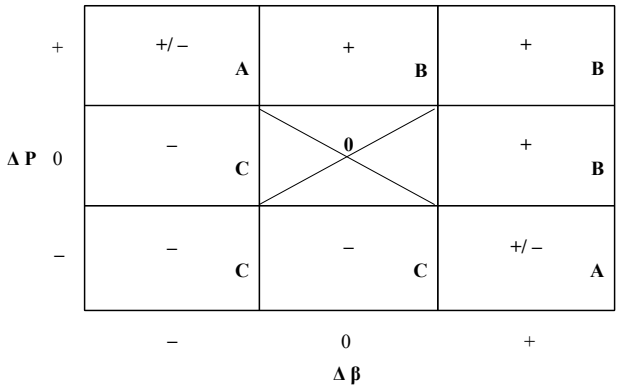


Figure 4.5 Enterprise and industry: basic relationship (2).

1. an area in which the combined effect of $\Delta P / \Delta\beta$ necessarily leads to a favorable result for the enterprise (area B);
2. an area in which the combined effect of $\Delta P / \Delta\beta$ necessarily leads to an unfavorable result for the enterprise (area C);
3. an area in which the combined effect of $\Delta P / \Delta\beta$ may lead to a net result that can be either favorable or unfavorable (area A).

BREAKDOWN OF BUSINESS GOODWILL: SYSTEM GOODWILL AND POSITIONAL GOODWILL

The distinction between profitability and risk of the competitive system, on one hand, and profitability and risk of the enterprise, on the other, allows

for further breakdown of the value of each business goodwill. The goodwill of business r of the enterprise is equal to:

$$\mathrm{Gnb_{r0}} = \sum_{s=1}^{\infty} \frac{[yb_{rs} - (keb_r U \times Cb_{rs-1})]}{(1+keU)^s} \qquad [3.1a]$$

or, keeping into account the risk compensating effect

$$\mathrm{Gnb_{r0}} = \sum_{s=1}^{\infty} \frac{[yb_{rs} - (keb_r U \times Cb_{rs-1})]}{(1+keb_r U)^s} \qquad [3.1b]$$

in which:

$\mathrm{yb_{rs}}$ = operating profit of the business r after taxes in accounting period s;

$\mathrm{keb_r U}$ = cost of unlevered equity estimated with reference to the business area r;

keU = cost of unlevered equity estimated with reference to the enterprise taken as a whole;

$\mathrm{Cb_{rs-1}}$ = operating capital invested in the business area r at end of period s–1.

We are now able to say that this value is conceptually associated with two phenomena: abnormal earnings of the competitive system and abnormal earnings of the individual enterprise. The following relation therefore applies:

$$\mathrm{Gnb_r} = \mathrm{Gnp_r} + \mathrm{Gns_r} \qquad [4.1]$$

in which $\mathrm{Gnp_r}$ and $\mathrm{Gns_r}$ stand for, respectively, positional goodwill in business r, i.e., the goodwill value connected to the advantageous position of the enterprise, and system goodwill in business r, i.e., the goodwill value connected to the favorable profitability of the competitive system. The considerations made in the previous section allow the calculation of both values. In fact, introducing the following data:

$\mathrm{ROIS_{rs}}$ = average operating profitability of business r system, after taxes in accounting period s;

$\mathrm{kes_r U}$ = system cost of unlevered equity of business r, calculated using the industry βUs_r (in Chapter 3, $\mathrm{kes_r U}$ was assumed to be equal to $\mathrm{keb_r U}$; that is, the enterprise risk in the business area was assumed to be equal to the overall risk of the business):

$$\mathrm{Gns_{r0}} = \sum_{s=1}^{\infty} \frac{[(ROIS_{rs} - kes_r U) \times Cb_{rs-1}]}{(1+kes_r U)^s} \qquad [4.2]$$

It should be noted that in the expression [4.2] the value of the operating capital is equal to the value of the operating capital of the enterprise ($\mathrm{Cb_{rs-1}}$). In

other words, the assumption is made that the Cb value (enterprise operating capital) is equal to the average operating capital used by the enterprises of the industry (Cs).[5] This assumption allows for the reduction of the complexity, especially algebraic, of some passages that will be shortly shown. Let us now consider once again the numerical example introduced in Chapter 3, where a goodwill of 500 was broken down into two business goodwill values, a corporate goodwill and a risk compensating effect:

$$Gn = Gnb_1 + Gnb_2 + Gnc + RCE = 213.33 + 180.87 + 100 + 5.8 = 500$$

where

$$Gnb_1 = \frac{127.2 - 0.09 \times (1{,}200)}{0.09} = \frac{19.2}{0.09} = 213.33$$

$$Gnb_2 = \frac{112.8 - 0.0115 \times (800)}{0.0115} = \frac{20.8}{0.0115} = 180.87$$

$$Gnc = \frac{60 - 0.1 \times (500)}{0.1} = \frac{10}{0.1} = 100$$

Let us consider business goodwill 1, equal to 213.33. The rate of 9 per cent cost of the enterprise capital in business 1 had been calculated based on an unlevered beta value of 0.9. Let us now assume that the system profitability value and the risk of the competitive system are respectively the following:

$ROIS_1$ = 9.5%;

kes_1U = 8.75%, with an industry-specific beta value that is lower than that applied to the enterprise and that is equal to 0.85; that is, the assumption is made that the average risk conditions at the system level are slightly lower than those that the enterprise actually takes on in the business—that is, $keb_rU > kes_rU$.

Applying as usual the perpetual rent formula, the following results:

$$Gns_1 = \frac{[(9.5\% - 8.75\%) \times 1{,}200]}{0.0875} = \frac{9}{0.0875} = 102.85$$

Hence, calculating the positional goodwill as a difference (213.33–102.85 = 110.48) in the case at hand, the breakdown would result in the following:

$$Gnb_1 = Gnp_1 + Gns_1 \qquad [4.1]$$

$$Gnb_1 = 110.48 + 102.85 = 213.33$$

in which positional goodwill slightly prevails over the system goodwill. Without introducing any new information, positional goodwill may also be analyzed. In fact, it has been observed that such goodwill is the result of favorable conditions, in terms of profitability and risk, in comparison to those that characterize the competitive system as a whole. Therefore, the value of 110.48 can be broken down into a profitability effect and into a risk effect.

The enterprise profitability in the business is equal to 10.6 per cent while the average system profitability is equal to 9.5 per cent. The capital cost of the enterprise in the business is equal to 9 per cent while the average system riskiness is equal to 8.75 per cent. In order to compute the profitability effect and the riskiness effect, it should be reminded that the positional goodwill has been obtained from the difference between business goodwill and system goodwill. This difference can be formalized as follows:

$$\mathrm{Gnp_{r0}} = \sum_{s=1}^{\infty} \frac{[(ROIB_{rs} - keb_r U) \times Cb_{rs-1}]}{(1 + keb_r U)^s} - \sum_{s=1}^{\infty} \frac{[(ROIS_{rs} - kes_r U) \times Cb_{rs-1}]}{(1 + kes_r U)^s} \quad [4.3]$$

Neutralizing the risk differential, that is, kesU = kebU, the income effect can be isolated and highlighted (IE)

$$\mathrm{IE} = \sum_{s=1}^{\infty} \frac{[(ROIB_{rs} - keb_r U) \times Cb_{s-1}]}{(1 + keb_r U)^s} - \sum_{s=1}^{\infty} \frac{[(ROIS_{rs} - keb_r U) \times Cb_{rs-1}]}{(1 + keb_r U)^s}$$

$$\mathrm{IE} = \sum_{s=1}^{\infty} \frac{[(ROIB_{rs} - ROIS_{rs}) \times Cb_{rs-1})]}{(1 + keb_r U)^s} \quad [4.4]$$

that is, in our numerical example

$$\mathrm{IE} = \frac{[(10.6\% \ - 9.5\%) \times 1{,}200]}{0.09} = \frac{13.2}{0.09} = 146.67$$

If instead we neutralize the profitability differential, that is, ROIS = ROI, the risk effect (RE) is highlighted

$$\mathrm{RE} = \sum_{s=1}^{\infty} \frac{[(ROIS_s - keb_r U) \times Cb_{rs-1}]}{(1 + kebU)^s} - \sum_{s=1}^{\infty} \frac{[(ROIS_s - kes_r U) \times Cb_{rs-1}]}{(1 + kes_r U)^s} \quad [4.5]$$

in our numerical example:

$$\frac{(9.5\% \ - 9\%) \times 1{,}200}{0.09} - \frac{(9.5\% - 8.75\%) \times 1{,}200}{8.75\%} = 66.66 - 102.85 = -36.19$$

obviously:

$$Gnp_r = IE + RE = 146.67–36.19 = 110.48 \qquad [4.6]$$

GOODWILL AND EVALUATION OF CAPABILITIES

By analyzing the nature of the competitive system and the competitive positions of enterprises, it is possible to devise other breakdown methods whose sustainability however should be evaluated on an individual basis. In particular, the so-called differential analysis might be somehow useful. This analysis method was introduced in the previous chapter and its logics can also be applied in view of an evaluation of resources, which, as shown, play a critical role in the determination of competitive performance. A typical difficulty posed by this breakdown method is the identification of the resources to be evaluated. To this purpose, a few principles should be followed:

1. the resources that can be characterized as individual assets (even though they have not been entered into the accounts) should be directly evaluated (with various methods, differential analysis included) and therefore do not fall within this breakdown method (see next chapter);
2. studies of the resource-based view have shown that resources able to generate abnormal earnings must fulfil specific requirements (they must be rare, irreproducible, irreplaceable and usable for strategic purposes);
3. resources must be identified with specific reference to each individual business goodwill (and its component of positional or system) or to corporate goodwill;
4. the relation between the identified resource and abnormal earnings must be reconstructed in a clear way; otherwise it is advisable to exclude this breakdown method.

These principles suggest that the breakdown method should be based on the enterprise capabilities that, on one hand, do not fulfil the requirements to be evaluated as autonomous assets and, on the other hand, if correctly identified, display the required qualitative characteristics. For the purpose of the evaluation, it is advisable to use a classification of capabilities without which even their identification would be complex (Figure 4.6).

First of all, it is possible to draw a distinction between basic capabilities, of a technical-managerial kind, and dynamic capabilities. The former develop and guide the production/distribution process of an enterprise (in the phase of acquisition, processing and transfer of company resources); the latter

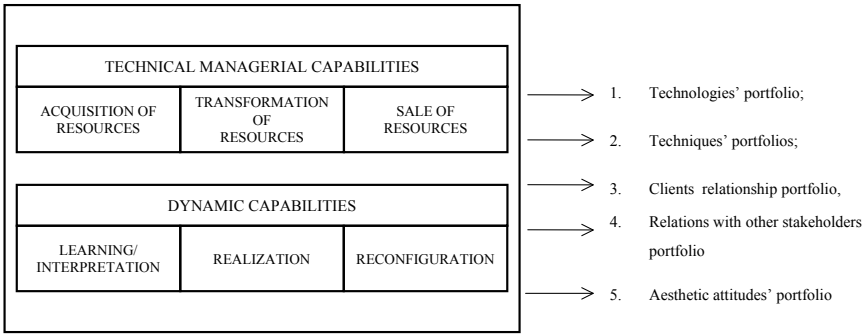


Figure 4.6 Capabilities.

direct and develop innovation processes and consist, as shown in the section titled "Competitive Heterogeneity and Resource-Based View (RBV)," of capabilities concerning learning and interpretation, strategic realization and reconfiguration of activities. In terms of content, basic and dynamic capabilities are at the origin of a different kind of production resources that can be classified in five groups:

- quantity and quality of available technologies of an enterprise, that is, the complex of resources applied to firm activity (technologies portfolio);
- quantity and quality of available techniques of an enterprise, that is the whole of behavioral rules on which are based all the activities carried out in the firm (techniques portfolio); (as happens for capabilities, also these technologies and techniques can concern the phase of acquisition, transformation and sale of resources).
- quantity and quality of the relationships between an enterprise and its clients (portfolio of clients relationship);
- quantity and quality of the relationships between an enterprise and other significant significant stakeholders (stakeholders portfolio);
- quantity and quality of knowledge and attitudes concerning aesthetics, taste and style, which, in certain competitive environments play a key role, oftentimes also coupled with substantial technological portfolios (portfolio of aesthetic attitudes).

It is necessary to clarify some features of this classification, also in relation to what we will see in the next chapter. Into the five portfolios mentioned above are grouped all the resources of the enterprise, both tangible and intangible, both recorded in the financial statement and not recorded. Each resource set into the portfolios has a relationship with an underlying capability. It is necessary to remark that this is true for all the resources, as well as for a recorded material asset (where the underlying capabilities

could be limited to the financial capabilities related to the acquisition). For the intangible resources the link with the capabilities is particularly significant because:

- it helps to identify and to define the intangible resource;
- it allows to qualify the intangible resource; in particular, it allows to understand the innovation of the resource (linking it to the technician and managerial capabilities or to the dynamic capabilities).

It should be made clear that the grid of portfolios now proposed can only be used as a general reference and that in it each enterprise can and must identify those capabilities that evidently have an impact on the performance. Therefore, for example, in specific competitive environments, it makes little sense to concentrate on the technological portfolio, just as in other environments style and taste make little sense. In certain competitive environments, instead, as in advanced professional services, the relational portfolio is a critical competitive resource. The differential analysis is composed of a few key steps, which, in the case of business goodwill, can be summarized as follows:

1. identification of capabilities that one wishes to evaluate;
2. relation of the capability to a specific business (or, as an alternative, relation to corporate);
3. relation between capability and competitive position (that is, if the capability affects, in the case of businesses, structural profitability or positional profitability);
4. evaluation of positional or system business goodwill or corporate goodwill in conditions of lack, or in any case neutrality, of the identified capability (i.e., without distinctive elements);
5. evaluation, as a difference, of the capability being analyzed.

To make the analysis of the evaluation methodology easier, the following numerical examples can be used. Let us consider the business goodwill evaluated in the first business area and equal to 213.33:

$$Gnb_r = Gnp_r + Gns_r \qquad [4.1]$$

$$Gnb_1 = 110.47 + 102.86 = 213.33$$

Let us assume that within this business two critical capabilities for performance purposes are identified: a distinctive capability in the design of the product, which ensures to the enterprise an advantageous position in terms of differentiation, and a production capability with which the enterprise reaches a sufficiently high production rate and realizes an economy of scale in line with those of its major competitors. The first capability can be easily connected to position, while the second one can

be connected to presence in the competitive system. In other words, the first one originates positional goodwill, and the second one originates system goodwill. At this point, the differential analysis consists of understanding the magnitude of the impact of the two identified resources (capabilities) on the performance equal to 110.48 and 102.85. To start, let us take into account the positional goodwill, which is equal to 110.48. Critical variables for its determination are:

$$\mathrm{Gnp_r} = \sum_{s=1}^{\infty} \frac{[(ROIB_{rs} - keb_r U) \times Cb_{rs-1}]}{(1 + keb_r U)^s} - \sum_{s=1}^{\infty} \frac{[(ROIS_s - kesU) \times Cb_{rs-1}]}{(1 + kesU)^s} \quad [4.3]$$

that is:

- difference between EPB and EPS, i.e., between enterprise operating profit and system operating profit, given that the value of C remains unvaried at system and enterprise level;
- difference between keb(U) and kes(U).

Let us now assume a situation whereby an enterprise lacks a distinctive design capability and therefore is in line with the average competitive system. This kind of lack has an effect on sale price (which is lower) and design costs (which are also lower, although to a lesser extent in comparison to sale price). The combined effect of the two variations drops the ROIB value from current 10.6 per cent to 10.0 per cent. With this variation, and keeping unaltered the other variables, the new $\mathrm{Gnp_1}$ value is equal to:

$$\mathrm{Gnp_1} = \frac{[(10\% - 9\%) \times 1{,}200]}{0.09} - \frac{(9.5\% - 8.75\%) \times 1{,}200}{0.0875} = 133.33 - 102.85 = 30.47$$

The differential effect shows that a substantial portion of positional goodwill consists of the distinctive capabilities that the enterprise has gained in relation to design, which are in the amount of 80, that is, equal to the difference between 110.47 and 30.47. These capabilities do not fully explain the value of positional goodwill. In fact, an approximate value of 30 persists, even when they are not present. Positional goodwill is probably due either to other resources, which in the analysis at hand do not emerge in such a clear manner as to allow their isolation and execution of a separate evaluation, or to the overall value of synergic effects. In any case it is a residual value that is not subject to further breakdown. Let us now consider system goodwill, which is equal to 102.85. In this case, it is the production capability and related unit product prices that count. This capability is linked to system goodwill, since it characterizes all actors of the production system and does not constitute a differential in the position of the enterprise. As previously shown, system goodwill is calculated following this approach:

$$\mathrm{Gns}_{r0} = \sum_{s=1}^{\infty} \frac{[(ROIS_{rs} - kesU) \times Cb_{rs-1})]}{(1 + kesU)^s} \qquad [4.2]$$

Assuming that the value of capital (C) at the enterprise level matches the average value of capital at the system level ($Cb_{rs-1} = Cs_{rs-1}$), the Gns value depends on:

- the profit generated on average in the system (EPS);
- the values of keU and C;

$$\mathrm{Gns}_1 = \frac{[(9.5\% \ - 8.75\%) \times 1{,}200]}{0.0875} = \frac{9}{0.0875} = 102.85$$

The production capability allows an enterprise to reach a certain return on capital. Failing this, such profitability would substantially shrink due to a rise in the production cost that is not balanced off by a probable reduction in invested capital. In this case, therefore, it is merely necessary to ask what would happen to the enterprise profitability if the production outputs significantly decreased due to a technical/managerial capability in the processing activity not being in line with the average system capability. For example, if such profitability fell to 9 per cent (assuming an invested capital of 800) the system goodwill value for the enterprise would be equal to 22.85, which would result, using the procedure previously described for positional goodwill, in a production capability value of 80 (102.85–22.82). However, it is more likely that a volume contraction determines a very significant fall in the enterprise profitability, even below the capital system cost. In this case, even without a differential analysis, it is fair to conclude that the resource or production capability fully originates the system goodwill, in the sense that without such resource or capability the enterprise could not operate inside the competitive system.

Finally, as regards corporate goodwill, the analytical path is not far from the one proposed with regard to business goodwill. The methods for determining corporate goodwill, illustrated in Chapter 3, already allow the identification of the capabilities that should be evaluated. The corporate goodwill in fact had been determined using a bottom-up approach, starting from the two corporate activities of top management and planning. If we accept the hypothesis that the capabilities being evaluated correspond to the two identified activities (top management and planning), then a corporate goodwill breakdown is already possible. In fact:

- as a start, the costs of the two activities are known (70 for top management and 30 for planning);

- figurative revenues are known: in Chapter 3 these had been computed by multiplying costs by the ratio between revenues and costs in each of the two businesses:

$$60 \times 1.88 + 10 \times 2.21 = 134.9$$

$$20 \times 1.88 + 10 \times 2.21 = 59.7$$

- to keep the approximation consistent with the overall value of 200, figurative revenues in the two activities become respectively equal to 137 and 63;
- the difference between revenues and costs results in a margin of 67 in the top management activity and of 33 in the planning activity; based on a rate of 40 per cent, after-tax values of 40.2 and 19.8 are obtained, respectively, for top management and planning;
- the allocation of the overall value of operating assets is missing, which in the example made in Chapter 3 were equal to 500; even if a fairly advanced company accounting might describe the methods used to allocate this value among top management and planning, failing evident structural differences, it is more appropriate to conventionally divide the value of overhead assets into equal portions (250 for each activity), or replicate the relation existing between costs (in our example, 70 per cent for top management and 30 per cent for planning); we opt for this second solution.

Based on the so elaborated data, it is possible to split corporate goodwill (100) among the two activities. In fact, starting from

$$\text{Gnc} = \frac{60 - 0.1 \times (500)}{0.1} = \frac{10}{0.1} = 100$$

the following results for top management

$$\text{Top management} = \frac{40.2 - 0.1 \times (350)}{0.1} = \frac{5.2}{0.1} = 52$$

$$\text{Planning} = \frac{19.8 - 0.1 \times (150)}{0.1} = \frac{4.8}{0.1} = 48$$

As briefly mentioned in Chapter 3, this type of breakdown process is not always possible and, besides any consideration on its feasibility, it does not always make sense. The determination of corporate goodwill and, even more so, of more analytical values within it is mostly a work hypothesis whose plausibility and usefulness should be carefully evaluated on an individual basis.

The evaluation of capabilities can be simplified by developing a system of indicators, which can also be very sophisticated, to monitor over time the trend of capabilities (even in a comparative sense, i.e., in comparison to direct competitors, if possible). The indicators do not replace the evaluation process but may complement it, making it more reliable and verifiable. As regards the techniques for the elaboration and use of the above-mentioned indicators, reference should be made to specialized literature, which, beginning from the elaboration of balanced scorecards, has been particularly fruitful (Kaplan & Norton 1996).

IN BRIEF

In this chapter, business goodwill and corporate goodwill have been further broken down, by means of the analysis of the competitive phenomena associated with them. In particular, the following has been shown:

1. abnormal earnings of an enterprise can be caused by phenomena of a structural kind (system goodwill) as well as positional phenomena within the system (positional goodwill);
2. abnormal earnings find in the company resources the final explanation.

Figure 4.7 shows a summary of the breakdown method followed in this chapter.

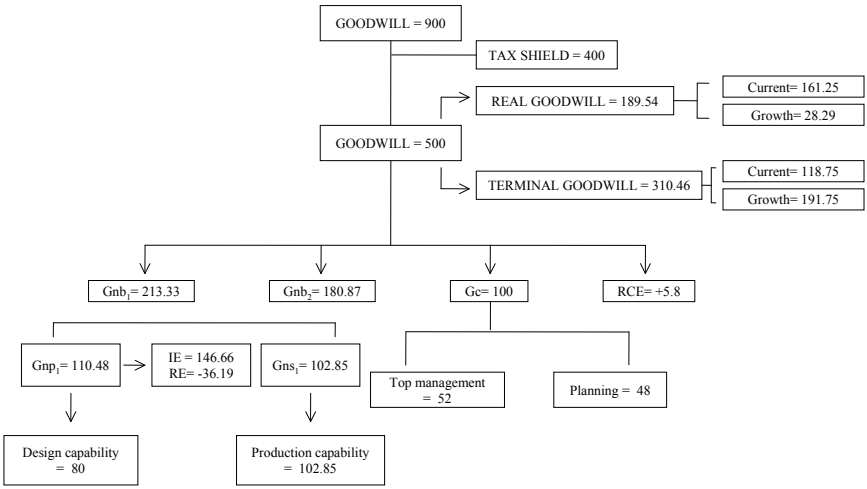


Figure 4.7 In brief.

Based on this, the following emerges:

- evaluation of positional and system goodwill values relative to business 1;
- evaluation of profitability effect and risk effect relative to positional goodwill of business 1;
- assessment of the design capability value relative to positional goodwill of business 1;
- evaluation of the production capability value relative to system goodwill of business 1;
- assessment of the value of the activities of top management and planning, relative to corporate goodwill.

5 Valuation of Unrecorded Intangible Assets and Reduced Goodwill

THE VALUATION OF INTANGIBLE ASSETS AS A SCHEME FOR GOODWILL BREAKDOWN

The last breakdown scheme is based on unrecorded intangible assets, whose value is part of the goodwill, in order to obtain the following relation:

$$Gn = IA + Gnr \qquad [5.1]$$

where Gn is, as always, the goodwill value, IA the value of intangible assets, autonomously valuated, and Gnr the value of reduced goodwill, that is, the goodwill value excluding IA. This type of breakdown consists of two steps.

1. Preliminarily, it is necessary to clarify the meaning of the valuation of specific assets within the goodwill value and which are the implications of a goodwill reduction process. In this context it is also important to understand the logics and limitations according to which intangible assets are recorded.
2. Furthermore, it is necessary to understand how the individual and specific assets should be identified and how they should be valuated.

The next sections of this chapter are dedicated to an in-depth description of the above two steps.

THE PROCESS OF GOODWILL REDUCTION

To get to the expression [5.1] means to reduce the goodwill value in order to express at least a part of it in the form of intangible assets autonomously identifiable and evaluable. The new expression can be written as follows:

$$Gn = IA_{s-1} + \sum_{s=1}^{\infty} \frac{[y_s - keU \times (C_{s-1} + IA_{s-1})]}{(1 + keU)^s} \qquad [5.2]$$

with:

y_s: operating profit after tax in the s accounting period, i.e., operating profit multiplied by (1–t);
keU: cost of unlevered equity;
C_{s-1}: operating invested capital at the end of period s–1;
IA_{s-1} : intangible asset autonomously evaluated at the end of period s–1.
with Gnr, reduced goodwill, equal to:

$$\text{Gnr} = \sum_{s=1}^{\infty} \frac{[y_s - keU \times (C_{s-1} + IA_{s-1})]}{(1+keU)^s} \qquad [5.3]$$

The formulation [5.1]

$$\text{Gn} = \text{Gnr} + \text{IA} \qquad [5.1]$$

analytically developed

$$\sum_{s=1}^{\infty} \frac{[y_s - (keU \times C_{s-1})]}{(1+keU)^s} = \sum_{s=1}^{\infty} \frac{[y_s - keU \times (C_{s-1} + IA_{s-1})]}{(1+keU)^s} + \text{IA}_{s-1}$$

is verified when:

$$IA_{s-1} = \sum_{s=1}^{\infty} \frac{keU \times IA_{s-1}}{(1+keU)^s}$$

Using the keU rate, the determination of the full goodwill value corresponds to the sum of the reduced goodwill and the IA values, if the rate of return implicit in the intangible assets value is equal to keU (see the section titled "The Goodwill and the Intangible Resources" in Chapter 1). Two more issues have to be dealt with. The first one regards the possibility of determining the reduced goodwill acting on the operating profit, that is:

$$\text{Gn} = \text{IA}_{s-1} + \sum_{s=1}^{\infty} \frac{[yr_s - (keU \times (C_{s-1})]}{(1+keU)^s} \qquad [5.4]$$

with yr_s equal to the operating profit reduced by an amount equal to the cost of the intangible IA's loss.

If, for example, the IA value would be estimated through the royalty method (in the way we will see later), then the royalties' percentage corresponds to the cost of loss. In any case, the expressions [5.2] and [5.4] correspond when the IA cost of loss is equal to keU. In fact,

$$\sum_{s=1}^{\infty} y_s - [keU \times (C_{s-1} + IA_{s-1})] = \sum_{s=1}^{\infty} yr_s - [keU \times (C_{s-1})]$$

$$\sum_{s=1}^{\infty} yr_s = \sum_{s=1}^{\infty} y_s - [keU \times IA_{s-1}]$$

The second issue regards the identification of the most suitable level to reduce the goodwill value: this level corresponds to business goodwill and, if present, to corporate goodwill. As we will see later, the identification of autonomously evaluable assets requires the assumptions of specific hypotheses regarding their nature and their competitive role. Therefore, the suitable level to develop the process of goodwill reduction is the business level, in which the contribution of the intangible asset can be easily understood. So,

$$\mathrm{Gn} = \sum_{r=1}^{m} Gnb_r + Gnc + RCE \qquad [3.10a]$$

changes itself into:

$$\mathrm{Gn} = \sum_{r=1}^{m} (Gnbr_r + IAb_r) + (Gncr + IAc) + RCE \qquad [5.5]$$

with:

Gnbr_r: reduced business goodwill in business r;
Gncr: reduced corporate goodwill;
IAb_r: intangible asset identified in business r;
IAc: intangible asset identified in corporate.

Analytically, [3.10b] with the process of goodwill reduction becomes:

$$\mathrm{Gn} = \sum_{r=1}^{m} \sum_{s=1}^{\infty} \frac{[yb_{rs} - keb_r U \times (Cbr_{s-1} - IAb_{rs-1})]}{[(1 + keb_r U]^s} +$$

$$\mathrm{IAb}_{rs-1} + \sum_{s=1}^{\infty} \frac{[h_s - (kU \times (Ch_{s-1} + IAc_{s-1})]}{[(1 + ke\ U]^s} + \mathrm{IAc}_{s-1} + \sum_{r=1}^{m} Sp_r \times C_r \times COM \qquad [5.6]$$

REDUCED GOODWILL AND CONTROLLED BADWILL

In the development of the breakdown scheme based on the identification of intangible assets, it is necessary to carefully look at the relation between the value of the reduced goodwill and the value of the intangible assets autonomously valuated. The following relations can be obtained:

$\mathrm{Gn} \geq \mathrm{IA}$

hence

$\mathrm{Gnr} \geq 0$

The magnitude of the value of IA, and more precisely, whether it approximates 0 or expresses a substantial value, depends on:

- the goodwill value, and therefore, the choices made in relation to the economic variables used to determine it;
- the nature of the identified intangible assets and the method selected to quantify them.

A more difficult situation to interpret is instead the following, where:

$$IA > Gn$$

with

$$Gnr < 0$$

Should the value of the intangible assets autonomously quantifiable be higher than the overall goodwill value, the reduced goodwill value would be negative; i.e., it would convert into a badwill (controlled badwill [CBA]) which acts in a conservative way with respect to the value of the intangible assets. This type of correction is sometimes used in the valuation practice, for example for banks and assurances. This phenomenon basically gives the following two indications:

- the goodwill value is actually given entirely by the value of one or more intangible assets;
- based on the conditions of perspective profitability and enterprise risk, the market value of the identified assets is greater than the value that these assume in the enterprise.

Correctness of these indications is subject to an implicit hypothesis, according to which the value of the intangible asset is a market value; that is, it is completely independent of the firm environment in which it is used. Let us take for example the following, extremely simplified case:

- net operating profit = 20
- capital cost = 9%
- invested capital = 100
- goodwill, resulting from the perpetual rent = 122.23
- value of trademark (autonomously valuated) = 130
- controlled badwill =–7.77

These data would yield a controlled badwill of–7.77 (122.23–130). This conclusion would be correct only if the trademark market value were equal to 130. If instead a portion of this value—for example, 20—were unsustainable

outside the firm environment under observation, then the controlled badwill would disappear and a reduced goodwill equal to a value of 12.23 (122,23–110) would emerge again.

REDUCED GOODWILL AND RECORDED INTANGIBLE ASSETS

In the previous chapters we have seen that, in evaluating the goodwill, the value of C, that is, the fair value of all recorded assets at the service of operational management, plays an important role. These assets as stated earlier may be physical, financial and even intangible. It is necessary to make a few considerations on the intangible assets that are recorded and that therefore contribute to the formation of the value of C. To start, let us take for example the financial statement of an enterprise in which a significant goodwill value, due to a merger that had occurred a few years earlier, has been recorded according to—assumingly—current IFRS 3 rules. In principle, the analyst has two options, i.e., either include the accounted goodwill value (Gn_A) in the invested capital or eliminate it, recording it separately. In the first case:

- operating profit = 20
- capital cost = 9%
- Gn_A value = 20
- invested capital = 100 (including G_A value)
- economic profit = 11
- goodwill, resulting from the perpetual rent = 122.23

In the second case:

- operating profit = 20
- capital cost = 9%
- Gn_A value = 20
- invested capital = 80 (excluding G_A value)
- economic profit = 12.8
- goodwill, resulting from the perpetual rent = 142.23

In this second case, one might say that the highest goodwill could be broken down into a reduced goodwill and a recorded goodwill:

$$Gn = Gnr + Gn_A$$
$$142.23 = 122.23 + 20$$

If we then added also the value of an identifiable and autonomously quantifiable intangible asset (IA), equal for example to 100, the following would result:

$$Gn = Gnr + Gn_A + IA$$

$$142.23 = 22.23 + 20 + 100$$

Generally speaking, we need to understand if each individual recorded intangible asset (whether it is a goodwill resulting from a business combination or from the acquisition of a participation of an operational but not of a control kind, or an autonomous intangible asset) inside the specific asset combination leads to the formation of normal profitability or is at the origin of abnormal earnings. In other words, we need to clarify if and to what extent it makes sense to calculate the normal profitability of C with or without the recorded intangible asset. Let us assume that we compare two enterprises operating in the same competitive system:

- enterprise A owns physical, intangible and financial assets in the amount of 50, 10 and 40, respectively;
- enterprise B presents a different combination, in the sense that among the recorded intangible assets there is a goodwill resulting from an acquisition: this goodwill expresses the value of a particularly significant and strongly distinctive know-how: the values of the three types of assets are in this case equal to 30, 50 and 20.

The cost of capital, determined in a CAPM environment, is 10 per cent for both enterprises. The profit of enterprise A is equal to 15 and the goodwill is equal to 50, while the profit of enterprise B is equal to 16 and the goodwill to 60. The comparison of the two goodwill values is scarcely significant, because the basic financial conditions taken as a reference are too inhomogeneous. In enterprise B, in fact, the following relation applies:

$$Gn = Gnr + Gn_A$$

$$110 = 60 + 50$$

In terms of an overall evaluation of the enterprise assets (VA), it means that we go from the following expression:

$$VA = C + Gn$$

$$VA = 100 + 60 = 160$$

where C is the recorded invested capital, to an expression of this kind

$$VA = C + Gnr + Gn_A$$

$$VA = 50 + 60 + 50 = 160$$

This second expression is more correct, also and foremost for the profitability implicit in each addend. We know in fact that in the competitive system taken as reference the profitability is equal to 10 per cent. The profit of enterprise A (15) therefore is the result of the sum of a normal (10, i.e., 10% of 100) and an abnormal earning of 5. In enterprise B instead, isolating the recorded goodwill, it is fair to say that the normal profit is equal to 5 (10% of 50) while the remaining value of 11 is to be sought in the abnormal earnings.

IDENTIFICATION OF INTANGIBLE ASSETS FOR ACCOUNTING PURPOSES

The standard setters IASB and FASB have issued, respectively, the standards IAS 38 and SFAS 142 to regulate the accounting recognition of intangible assets. In both cases, other accounting standards are also important, in particular, the ones concerning the accounting treatment of business combinations, IFRS3 and SFAF 142 (recently revised). The logics followed by the two standard setters are similar and, in this section and in the next one, we will try to describe their most significant features. It is necessary to mention that, within the Memorandum of Understanding (MoU) between the IASB and the FASB (27 February 2006), which sets up a Roadmap of Convergence between IFRSs and US GAAP 20, a first reflection about the new logics of intangible assets' accounting regulation has begun. We will deal with these new logics in the section titled "The Accounting of the Internally Generated Intangible Assets: Possible Developments." The accounting process of any asset requires dealing first with the asset identification and then with its evaluation. In the case of intangible assets, the identification process presents, for obvious reasons, some specific difficulties.

From an accounting point of view, intangible assets can be defined as non-monetary assets without physical substance, which are controlled by the enterprise and from which future economic benefits are expected to flow to the enterprise (general criterion for the accounting of any asset). According to both the IAS 38 and the SFAS 141, intangible assets meet the identifiability criterion when:

- it is separable, i.e. is capable of being separated from the entity (sale, exchange, rent, etc.) either individually or together with a related contract, asset or liability; or
- the control of future economic benefits arising from the intangible is warranted by contractual or other legal rights.

The two criteria, conceptually linked, are proposed in an autonomous way; that is to say that the legal control criterion leaves aside the separability possibility, as the separability criterion should leave aside the possibility of

controlling the asset contractually or legally.[1] Another important aspect of the accounting of any asset is the recognition criterion that depends on:

- the probability that the expected future economic benefits attributable to the asset will flow to the entity, and
- the probability that the cost of the assets can be measured reliably.

Let us verify the observance of the recognition criterion in relation to the way in which the intangible asset comes into the entity, that is to say, in relation to the fact that the intangible is separately acquired, acquired as part of a business combination or internally generated. Normally, when an intangible asset is separately acquired, it is possible to state that:

- the probability recognition criterion is always considered to be satisfied, since the price an entity pays to separately acquire an intangible asset reflects expectations about the probability that the expected future economic benefits embodied in the asset will flow to the entity;
- its cost can usually be measured reliably; this is particularly so when the purchased consideration is in the form of cash or other monetary assets.

If an intangible asset is acquired as part of a business combination, the situation is, at least conceptually, different:

- the probability recognition criterion is normally satisfied, at least to the extent that the asset is identified according to the above-mentioned criteria;
- as regards the cost measurement, it necessary to remember that the intangible asset, according to both the IASB and the FASB, has to be recognized at its fair value: the recent process of accounting standards review (IFRS 3 and SFAS 141) leads us to assume that the fair value of intangible assets acquired as part of a business combination can always be measured reliably.

As regards the internally generated intangible assets, the accounting standards are particularly restrictive. They provide specific exclusions about the possibility of identifying some internally generated intangible assets, because of the difficulty of distinguishing them from the internally generated goodwill. In particular, they prohibit the recognition of trademarks, trade names, newspaper mastheads, editorial rights, customer lists, and costs incurred to start up a business, to train employees, for advertising and promotional activities, and for partial or total enterprise reorganization. A specific matter concerns the research and development costs, treated in a detailed way by both IAS 38 and SFAS 2 (accounting for the research and development costs): the first one, unlike the second one, provides the

possibility of capitalizing costs associated with the development phase (and not the research phase) and just under specific conditions.

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The SFAS 141 and the Illustrative Examples section of the IFRS 3 set up an illustrative classification of the different intangible assets that, acquired in a business combination, should, in different ways, meet the recognition criteria mentioned above. The classification, even if just exemplifying, has a certain importance because it suggests an articulated prospect of intangible assets, classified into the following five groups:

- marketing-related intangible assets (trademarks, trade names, service marks, certification marks, collective marks, internet domain, trade dress, newspaper mastheads, non-competition agreement);
- customer-related intangible assets (customer lists, order or production backlog, customer contracts and the related customer relationships, non-contractual customer relationships);
- artistic-related intangible assets (copyrights for books, plays, films, music, pictures, photographs, operas and ballets, musical works such as compositions, song lyrics and advertising jingles, video and audiovisual material including films, music videos and television programmes);
- contract-based intangible assets (licensing, royalty, standstill agreements, advertising, construction, management, service or supply contracts, lease agreements, construction permits, franchise agreements, broadcast rights, use rights, such as water, air, timber cutting, servicing contracts such as mortgage servicing contracts, employment contracts);
- technology-based intangible assets (patented technology and unpatented technology, software, databases, trade secrets such as formulae, processes and recipes).

EVALUATION OF INTANGIBLE ASSETS FOR ACCOUNTING PURPOSES

For intangible assets separately acquired, the price paid by the acquirer represents the best indicator of its fair value. Also, for the intangible assets acquired in a business combination and recognized separately from goodwill, the fair value criterion is met. However, in this case, since there is not a specific transfer price, the accounting standards set up a hierarchy of evaluation approaches:

- the quoted market price in an active market provides the most reliable estimate of the fair value of an intangible asset (IAS 38 defines

an active market as one in which the items traded are homogeneous, willing buyers and sellers can normally be found at any time, prices are available to the public); the appropriate market price is usually the current bid price or, if the current bid price is unavailable, the price of the most recent similar transaction may provide a basis on which to estimate fair value;

- if no active market exists for an intangible asset, its fair value is the amount that the entity would have paid for the asset, at the acquisition date, on the basis of the best information available: to this purpose, the enterprise, besides considering the most recent transactions for identical or similar intangible assets, can develop other techniques for estimating intangible assets' fair value, on the condition that these techniques reflect the practice of the industry to which the entity belongs: these techniques include the multiples approach (to revenues, market shares, operating profit) or the royalty stream that the entity could obtain from licensing the intangible asset (as in the relief from royalty approach), and the Discounted Cash Flow (DCF) approach, that consists of discounting the estimated future net cash flow from the asset.

Finally, just concerning IAS 38, the costs associated with an asset internally generated through the development phase are capitalized. All the above mentioned are valid for the initial recognition. After the initial recognition, the evaluation approach changes according to whether the intangible assets have a finite or an indefinite useful life. In the first case, the intangible asset is amortized, whereas in the second case, the intangible asset is not amortized but it is subjected, at least once a year, to the impairment test, as we have already seen in Chapter 1, dealing with goodwill acquired in a business combination. The intangible assets impairment test requires in-depth discussion because it includes some important evaluation suggestions. For the sake of brevity, in this work, we will focus our attention on the IAS/IFRS accounting standards.

The impairment test consists of a periodical verification of the assets' value, on the basis of the accounting standard IAS 36, according to which physical and intangible assets have to be recorded in the financial statement at a value that cannot be higher than their recoverable value, equal to the higher between the asset's fair value (less costs to sell) and its value in use. As far as the fair value is concerned, the considerations already introduced as regards the evaluation of the intangible assets acquired in a business combination remain valid. As regards the value in use, instead, this is defined as the actual value of the future financial flows expected from the usage and the final disinvestment of the asset under evaluation. It is important to underline that the difference between fair value and value in use is not based on the methodology adopted, which can be based, in both the cases, on the actual value of the future financial flows expected, but on the different assumptions that drive the evaluation process: in fact,

in the case of fair value, the expectations of market participants are important, whereas in the case of value in use, the expectations of the specific enterprise matter. IAS 36 gives some important suggestions concerning the determination of future cash flows and of discount rate. As regards the cash flows determination:

- future cash flows shall include projections of cash inflows and cash outflows from the continuing use of the asset;
- future cash flows shall consider, if any, net cash flows to be received (or paid) for the disposal of the asset at the end of its useful life;
- flows shall not include cash flows from financial activities, income tax receipts or payments;
- flows have to include or exclude the effect of price increases attributable to general inflation (consistently with the discount rate determined, nominal or real rate);
- cash flow projections have to be based on rational and sustainable hypotheses, on the past results, on the more recent business plan and budgets approved by the management, and they have to cover at the maximum a five-year period (unless particular reasons suggest the choice of longer periods);
- over the period of analytic projection, it is necessary to use growth rates, g; g rates can be steady or decreasing and they cannot be higher than the growth rates of the products, industries and economies to which the enterprise refers.

As regards the discount rate, the following considerations are suggested:

- the discount rate has to include both the time remuneration and the remuneration of the specific activity's risk;
- it can not include risks already considered in the cash flow determination;
- it has to be a pre-tax rate (consistently with the flows, pre-tax flows) and, more generally, it has to have the same nature of the financial flows (so, it has to be a pre- or post-inflation rate consistently with the way the flows are determined and, most of all, it has to leave aside the enterprise's financial structure).

We have already dealt with the rate choice in Chapter 2 (in the section titled "A Few Numerical Examples"). As regards its relation with the financial structure, it is possible to state two more considerations:

- as regards the CGU evaluation, necessary for the goodwill impairment test, the reference to the independence from the financial structure can be interpreted as the adoption of a target financial structure (and consequently as the use of a WACC rate);

- as regards the evaluation of a single intangible asset, it should completely leave aside the way through which the asset is financed: so, it seems reasonable to use a keU rate.

THE ACCOUNTING OF THE INTERNALLY GENERATED INTANGIBLE ASSETS: POSSIBLE DEVELOPMENTS

The Memorandum of Understanding (MoU) between the IASB and the FASB (27 February 2006), aimed to achieve the convergence between the two standard setters, also included a project aimed to improve the intangible assets' accounting. In December 2007, a project proposal for the review of the IAS 38, based on a technical paper which became public on 23 January 2007, was submitted to the IASB: at the December meeting, the Board did not deem the inclusion of the project in its active agenda suitable (this also stopped the discussion within the FASB) but, at the same time, recognizing the relevance of the matter, the Board deemed the development of the research and consultation works necessary. To date, it is impossible to predict when the accounting standards IAS and FASB concerning the intangible assets will be reviewed; anyway, it is possible to suggest some reflections on the outstanding issues arising from the project proposal. The attention is focused on the internally generated intangible assets, and on the limits of their accounting.

- No intangible assets arising from research shall be recognized.
- The recognition of intangible assets arising from development is possible only in certain circumstances (and not provided by the SFAS).
- Internally generated brands, mastheads, publishing titles, customer lists and items similar in substance shall not be recognized as intangible assets.
- There is an inequality of treatment between intangible assets acquired in a business combination and intangible assets internally generated, even if the economic nature of these assets is the same one.
- After initial recognition, an entity is permitted to carry an intangible asset at cost or fair value (less any accumulated amortization and any accumulated impairment losses); in this second case, it is possible to carry periodic revaluations, with reviews of the amortization period and amortization method for intangible assets with a finite useful life. Anyway, with this last option being tied to the presence of quoted market prices in an active market, it is, in fact, not feasible.

The reasons for these choices are attributable to the nature of intangible assets and to the difficulties concerning their identification and evaluation. Anyway, in the last years, researchers and professional communities have begun to consider the negative consequences of an excessively conservative

attitude within the accounting of intangible assets, encouraged, in this sense, by the growing relevance taken by these assets in the value creation processes (see the Introduction). Given these premises, it is possible to describe, in a synthetic way, the more significant points, suggested by the technical project proposed early in 2007.

1. The identification criteria of intangible assets provided by the IASB's Framework for the Preparation and Presentation of Financial Statements (Whittington 2008) and, in particular, by the IAS 38 are irrespective of the manner in which an intangible item comes into existence; in other words, the identification criteria can be met both by assets acquired (separately or in a business combination) and by internally generated assets: genealogy is not an essential characteristic of an asset (Upton 2001).
2. For operating purposes, it is useful to distinguish two broad types of internally generated assets: those created out of specific planned projects, defined as planned internally generated assets (for example a brand creation) and those that arise from the day-to-day operations, defined as unplanned internally generated assets. The distinction between the two types of internally generated assets is tied, most of all, to the 'descriptor' used to identify and define the underlying economic phenomenon (and consequently the unit of account): in the first case, the project represents the natural descriptor; in the second case, in the absence of a specific project, the unit of account has to be defined time after time. For example, the descriptor 'brand' can be significant in some cases, but it can be an indefinite concept in other cases.
3. To identify the internally generated assets, the technical project suggests a simulation technique: an entity could assume the existence of a business combination in which the entity that has generated the asset internally is acquired. So, the standards provided by IFRS 3 and IAS 38 for the identification of intangible assets acquired in a business combination should be, at least in part, extended to the internally generated intangible assets.
4. After having identified the intangible assets, it is necessary to deal with the recognition matter. In this case, the technical paper distinguishes between the cost-based model and the valuation-based model (both provided in the Framework). In the first case, the cost-based model, only planned internally generated assets meet the recognition criteria (probable future economic benefits and reliable measurement of cost), whereas the absence of specific information seems to preclude the possibility of recognizing the unplanned internally generated assets. On the contrary, in the second case, the valuation-based model, all planned and unplanned internally generated assets that satisfy the IFRS 3's recognition criterion of "reliable measurement of value" should be recognized.
5. Consequently, as regards the measurement, if a cost-based model is adopted, all the historical costs incurred for the development of the plan

constitute the value of the planned asset, whereas they are not considered for the unplanned assets. On the contrary, if a valuation-based model is adopted, all the internally generated assets, planned and unplanned, "are capable of being reliably measured at fair value to the same degree that IFRS 3 asserts that the fair value of the same types of intangible assets acquired in a business combination are capable of reliable measurement" (IASB 2007).

IDENTIFICATION OF INTANGIBLE ASSETS THAT CAN BE AUTONOMOUSLY QUANTIFIED ALTHOUGH NOT RECORDED

We can now go back to the goodwill reduction process, which is based on the identification and valuation of unrecorded intangible assets. The problems to be tackled in relation to these assets are the following: why are they not recorded? And which are the criteria to identify and then valuate them? We have seen that intangible assets directly acquired or inside a business combination are basically recorded. Except for the possibility of capitalizing a few development costs (as allowed by IAS 38), the intangible assets internally generated by the enterprises are not subject to recording even though they fulfill the general requirements for accounting identification. In valuation practice, three requirements are usually defined for the identification of the intangible assets to be the object of an autonomous valuation, irrespective of the accounting needs:

- the asset must be the object of a significant and quantifiable flow of investments;
- the asset must be at the origin of differential economic benefits, and therefore also in this case specifically identifiable;
- the asset must be transferable, i.e., sellable and assignable to third economies.

Together, the first two requirements indicate that the intangible asset must be at the origin of costs with a deferred utility, while the criterion of transferability on a conceptual level is totally similar to the criterion of separability/transferability used by accounting principles, and can be applied in a more or less rigid way.[2] The identification process should develop observing a few additional tactics, which concern:

- the analysis of the nature and origin of the assets;
- the verification of the criterion of dominance.

In order to reach full understanding of the nature of the asset, it is necessary to proceed along three steps (Table 5.1).

Table 5.1 Intangible Assets Nature

	Dynamic	*Technical /managerial*			*Resources portfolios*					*Usage*			*Role*	
Intangible assets		Acqui-sition	Transfor-mation	Sale	Technolo-gies	Tech-niques	Clients	Stake-holders	Aesthetic	IP	Rights	Rela-tion-ship	People	Struc-ture
Tradename	X						X			X				X
Trademark														
Patented technology			X			X				X				X
Unpatented technol-ogy	X		X		X							X	X	
Distribution contracts														
Suppliers relationship				X				X				X		X
Database														
Formula														
Custumer list														
…														
…														

1. To identify the competitive capability from which the asset comes. These are the dynamic and technical/managerial capabilities described in Chapter 4.
2. To place consequently the intangible asset in the portfolio of resources (portfolio of technologies, techniques, relations with customers, relations with other stakeholders, aesthetic attitudes).
3. To valuate if the use of the asset depends on an intellectual property, a right afforded by contracts or on non-contractual relations (for example, relations with customers or with employees) (IVGN 2003). Furthermore, an effort should be made to understand the role played in the use of the asset by formalized processes of a structural/organizational kind and the people that operate in the organization (Harris & Helfut 1997, Castanias & Helfut 2001, Stone 2002).

For example, a patent may result from dynamic capabilities, be placed in the technological portfolio and used through intellectual property (where structural/organizational processes play a critical role). A distribution contract may be the result of a capability of a technical/managerial kind (relative to the phase of transfer of resources), be part of the portfolio of relations with other stakeholders and used through a relation of a non-contractual kind (with the people operating in the organization playing a fundamental role).

Finally, the criterion of dominance should be verified, whereby it is appropriate to identify and autonomously valuate only the intangible assets that characterize in a specific way (dominate) the enterprise. If the relation/trust aspect is predominant, then the assets connected to marketing will be identifiable. If instead the research/innovation aspect dominates, then the assets connected to technology will be identifiable. This criterion not only allows one to focus the attention actually on the assets that qualify the enterprise, leaving aside phenomena that in the end may prove marginal, or in any case, not autonomously quantifiable, but also and foremost to avoid duplications in the valuation of strongly interrelated assets (bundling).

THE VALUATION OF UNRECORDED INTANGIBLE ASSETS

The identification process alone is able to provide some useful information for the purpose of the subsequent valuation of the subject asset. Let us take for example the degree of innovation of the capabilities from which the asset originates, or the fact that the asset may be protected by IP or contracts. This and other information should be used in the adopted valuation methodologies. An important aspect, preliminary to the selection of the method, concerns the relation between the intangible asset and the enterprise owning and using it. The asset in fact should be quantified for its characteristics and not for the characteristics of the owner. In other words,

if the objective is to attribute a value to the subject asset, then the organizational circumstances of its use should exert no influence. Obviously, this principle, which is relatively easy to follow for physical assets, may imply many problems for intangible assets which by their own nature oftentimes show a very strong functional relation with the entity generating or using them. As we will see in the next sections, it is necessary to:

1. reduce to the bare minimum the influence of entity-specific factors in the valuation of the subject asset (for example cost of capital factors);
2. make explicit the role that entity-specific factors have played in the determination of the value of the subject asset.

It should also be considered that if the valuation of the intangible assets is used with the purpose of further breaking down the goodwill, the problem of the entity-specific factors appears less significant. In this case, the final purpose is not the valuation of the subject asset but rather the interpretation of the overall goodwill also through the valuation of subject assets. A further aspect to be considered preliminarily is the placement on the market of the asset. In this respect intangible assets, in relation to one another, may be (IVSC 2007):

- identical, as they share all relevant characteristics, such as functionality, duration, methods for use, geographical areas, etc;
- similar, as they share a few but not all relevant characteristics.

While it is certainly probable to identify a few degrees of similarity between the subject asset and other intangible assets—an indispensable condition, as explained further below, for the valuation process—it is instead very difficult to define two intangible assets as identical. The employable valuation techniques for intangible assets are many and represent an element in the valuation of the enterprise which is receiving increasingly more attention. In the following sections, we will examine a few methods used in common practice and belonging to the following three main methodological groups:[3]

- cost approach (historical cost, replacement cost);
- market approach (sales comparison approach);
- income approach (relief from royalties, premium profit method, multi-period excess earning method).

THE RESIDUAL HISTORICAL COST METHOD

Within the cost method, the intangible asset value is estimated on the basis of the costs that the entity should bear to obtain that specific asset

or an asset identical in terms of future expected benefits. In this way, the incurred costs become a proxy of the expected economic benefit, with all the limits implied. In this work, we will examine two methods: the residual historical cost and the replacement cost. The residual historical cost is based on the historical costs incurred to obtain the asset: these costs must be expressed at current values (monetary alignment) and less (residual value) the possible degradation suffered by the asset. If, for example, the costs incurred are equal to 100,000, the asset's useful life is equal to five years (with a straight line annual amortization quota of 20 per cent) and the number of years in which the asset has already been used is equal to 3 years, then the value of the asset is equal to 40,000 (100,000–60,000). Let us see, in detail, the outstanding elements of the evaluation. After the initial creation, it is necessary to add to the asset's value all the investment costs tied to future economic benefits. Instead, the costs that the entity incurred to maintain the functionality of the asset and that are not tied to increases of the asset's utility shall not be considered (maintaining expenses). As regards the expression at current value of the identified costs, the discount rate to be used should be, as it happens for the physical assets, specific to the intangible: the price variations used to determine the rate should be related to products or services economically linked to the intangible asset being evaluated. To this purpose, the rates used are: the consumer price index, the wholesale price index, the industrial production price index, etc.[4] Also within these general principles, it is possible to identify several technical solutions, depending on the subject asset evaluated. Let us consider, for example, the capitalization of research and development expenses used to assign a value to the research asset (Damoradan 2006). The first step consists of understanding what the amortizable life is for R&D expenses: in other words, the time taken by these investments to pay off. If the amortizable life is equal to 10 years and the amortization method is linear (10 per cent each year), then 10 euro paid 10 years ago are amortized for their 90 per cent and they have to be amortized during the current year for a value equal to 10. Instead, 100 euro paid 9 years ago have to be amortized for a value equal to 10 during the current year, but they will maintain a part of the value not amortized (and that represents part of the research asset's value) for a value equal to 10. In this way, the total value of the enterprise's research asset is obtained by adding, at the current year, the non-amortized values. So, with n, amortization period, t_0, the current year of evaluation, and CY_t, the research and development expenses for the year t:

$$\text{Research Asset} = \sum_{t=-(n-1)}^{t=0} CY_t \frac{(n+t)}{n} \qquad [5.7]$$

By way of illustration, in Table 5.2 the research asset's value is estimated with the parameters assumed in the text.

Table 5.2 Estimation of Research Asset's Value

	Year	*R&D Expenses*	*(n + t)/n*	*Unamortized portion*	*Amortization year 0*
t	0	514	1	514	
t	–1	500	0,9	450	50
t	–2	420	0,8	336	42
t	–3	412	0,7	288.4	41.2
t	–4	328	0,6	196.8	32.8
t	–5	320	0,5	160	32
t	–6	845	0,4	338	84.5
t	–7	240	0,3	72	24
t	–8	200	0,2	40	20
t	–9	100	0,1	10	10
t	–10	100	0	0	10
Research asset				**2,405.2**	
Amortization this year					**346.5**

The same logic can also be adopted for the evaluation of other intangible assets and other costs items. For example, recruitment and training expenses can be capitalized in order to determine the human capital asset (with some difficulties concerning the determination of the amortization period).

THE REPLACEMENT COST METHOD

When using the replacement cost method, the intangible asset is evaluated determining the costs that should be borne, on the estimate date, to procure an intangible asset that is identical or similar to the one that we wish to valuate. With respect to the criterion of the residual historic cost, in this way, one avoids inflating the value of the subject asset including in it any company inefficiencies. In fact the costs used for the quantification are not the costs actually incurred by the enterprise. Furthermore, the limitations inherent in the use of past costs seem to be at least in part overridden. These costs may become scarcely meaningful in the presence of constantly evolving competitive or environmental conditions. On the other hand, it is more difficult to obtain the necessary information. Possible procedures are basically three:

1. analytical procedures;
2. synthetic procedures;
3. procedures that employ indexes.

The main parameters that must be defined in the analytical methodology are:

- type, turnover, prices of resources necessary for the reproduction of the intangible asset being estimated;
- time necessary for realization of the asset;
- discounting rate to be applied to future investment flows, expressing the rent deemed adequate for investments that can be placed in the same risk class.

Using the synthetic method, the same procedure is followed, although in this case the annual average cost of asset development (CM) is being determined. In this way the following can be obtained:

$$\mathrm{IA}_0 = \sum_{t=1}^{n} \frac{CM}{(1+keU)^t} \qquad [5.8]$$

where keU is the discounting rate and n the period of time necessary for the realization of the asset.

The procedure that employs indexes consists of using coefficients or multipliers of the annual average cost of asset development, which implies the availability of information relative to valuating experiences that are at least partially consolidated and largely known in the reference industry. Not only that: it is also necessary to introduce adjustments to keep into account the peculiarities of the subject asset—since, as we have seen, intangible assets are rarely identical. The adjustments require the introduction of meaningful benchmarking, with logics that will be examined in the next sections. The new value obtained applying one of the three methods should also be adjusted following the possible deterioration of the asset. By deterioration we mean the reduction in the value caused by the use of the asset between the period in which the costs have been borne and the period in which the valuation is made. Such correction can be applied to the value of the asset as if it was new (IAn), with a coefficient calculated for the purpose, having at the numerator the residual life of the asset (Lr) and in the denominator the entire useful life of the asset (Lt):

$$\mathrm{IA} = \mathrm{IAn}\ \frac{Lr}{Lt} \qquad [5.9]$$

SALES COMPARISON APPROACH

According to the sales comparison approach, the intangible asset is evaluated by reference to comparable market transactions concerning identical or similar assets. From an operating point of view, the value of the subject

asset is obtained by reference to the comparable transaction price or, more frequently, using valuation multiples, determined by dividing the transaction price by a significant financial parameter.

For example, if the valuation multiple obtainable from a transaction is twice the EBITDA (price / EBITDA = 2), and the subject asset is traceable to an EBITDA equal to 80,000 euro, then the value of the asset is equal to 160,000 euro. In some cases, it is possible to obtain from a comparable transaction more valuation multiples, all significant for the asset evaluation. Within the methodologies based on the market observation, it is also possible to find other operating solutions such as, for example, the method of deal prices' implicit multiples. These multiples, elaborated through the observation of business combinations, are based on the ratio between the enterprise value (numerator) and a structure measurement like revenues, internet contacts, bank raising, etc. (denominator). Then the numerator is adjusted by deducting from the enterprise value the accounting value of all the activities that are not objects of evaluation, maintaining, in this way, only the intangible asset value. Through the denominator parameter, the subject asset value is obtained. The sales comparison approach is not easily usable for the evaluation of intangible assets, because it is often difficult to have a significant number of transactions that are really comparable, except for some intangible assets like brands that, at least in certain industries, are frequently objects of acquisition. Anyway, also in these last cases, the sales comparison approach requires some adjustments to be introduced in order to consider the existing differences between the conditions under which the comparable transactions happened and the specific conditions under which the subject asset is employed (as already mentioned, this is also true for the cost approach). The elements to observe carefully to introduce adjustments are the following:

- different features of the asset (market position, geographical coverage, technical functionality, use in B2B market or in B2C market, etc.);
- peculiarities concerning the acquirer or the seller of the considered transaction (contractual force, related party, etc.);
- time period of the transaction.

In Table 5.3, the benchmark for brand evaluation is represented. In this case, the basic information to be adopted is the multiple of historic turnover implicit in the transaction.

Based on two comparable transactions and analyzing two relevant factors (market position and geographic coverage), it is possible to identify the correct multiple with a range from 0.9 to 1.0.[5] To improve the efficiency of the adjustments introduction, it can be useful to shift from the accounting standards' definition of market (which can only be active or inactive) to a hierarchy of market activity.[6] The markets that, for accounting purposes, are defined as inactive markets may be different: let us think, in particular, of the auction markets for patents and copyrights that have taken place in the USA, in the

Table 5.3 Benchmark for Brand Evaluation

	Multiple of turnover implicit in transaction	*Geographic coverage*	*Market position*
Brand A	0.8	Europe(Italy, UK, France, Germany)	Medium
Brand B	1.5	Europe, Middle East	Strong
Subject brand	**0.9–1.0**	**Europe**	**Medium**

UK and in Germany. So, for example, a hierarchy of market activity could be articulated in:

- markets with specialist dealer and auction markets;
- markets with periodic dealer and auction markets;
- markets with brokers.

According to the kind of market, the adjustment process can be developed with a different level of deepening and complexity. In practice, the evaluation process based on market observations is developed through six outstanding steps:

- definition of the intangible asset subject to the evaluation and analysis of the transactions that can be considered comparable as regards both the asset nature and the nature of the enterprises involved;
- definition of the quantities relevant to estimate the asset's value, such as, for example, revenues, capital invested, etc.;
- definition of the parameter, multiplying or percentage, that ties the value of the intangible asset deducted from the comparable transaction with the relevant quantity chosen;
- identification of the elements to be observed in order to compare the subject asset with the asset's object of comparable transactions;
- adjustments of the parameter value according to the differences in the parameters identified (and according to the hierarchy of market activity);
- determination of the intangible asset's value.

EVALUATION METHODS BASED ON EXPECTED BENEFITS: FLOWS, RATE AND TIME PERIOD

According to the methods based on the expected benefits, the intangible asset is evaluated directly through the estimate of the benefits expected from it. Prior to examining the three most known and most used methods,

it is necessary to clarify some common principles regarding the result flows, the time period and the discount rates. The choices regarding the flows depend on which among the several evaluative variables is chosen: it can be a cash flow, an income flow arising from the asset or a saving of costs. So, there are several variables that can be examined:

1. turnover;
2. operating margins;
3. taxation charges;
4. working capital needs;
5. capital expenditure requirements.

Anyway, a basic choice has to be made among the methods using full quantities and the methods using differential quantities. In the first case, revenues and costs (or cash inflows and cash outflows) are full quantities; in the second case, instead, they are differential quantities coming from a premium price or from a cost saving. In practice, according to the differential method, the results obtained through the use of the asset are compared with the results that the enterprise would have obtained without its employment, being equal, as much as possible, to all the other productive conditions. This logic is usually adopted for the evaluation of intangible assets like brands, patents, and exclusive and restricted know-how. The differential method is also adopted within the loss method, even if it is characterized by a conceptual autonomy. It, in fact, consists of measuring the loss that the enterprise would support if it was deprived of the asset object of evaluation. From an operating point of view, it consists of determining the actual value of the results to which the enterprise would renounce through, precisely, a differential analysis.

Another choice, still of a preliminary nature, concerns the alternative between an analytic approach and a synthetic approach. The analytic approach requires the expected results to be estimated analytically, year by year, whereas, with a synthetic approach, the estimate takes a normal average configuration. In practice, the analytical approach is based on a DCF method, in which cash receipts are estimated for each of the future periods. The cash flows are converted to value using the present value techniques (by the application of a discount rate). The synthetic approach is based on the direct capitalization of a representative income level, which is divided by a capitalization rate or multiplied by an income multiple. As regards the time period, since the reflections mentioned within the historical cost methodology are also valid for the expected benefits approach, we will focus our attention on the distinction between intangible assets with a definite useful life and intangible assets with an indefinite life. For the first ones (definite useful life assets), the DCF approach (analytic method) is often used, covering a time period that is normally the shorter of the economic life (period over which the subject asset is expected to give an economic return) or the

legal life (period over which the subject asset is legally protected). In this case, it would be necessary to adjust the asset value in order to consider the amortization tax deduction (Tax Amortization Benefit [TAB]), using, for this purpose, an iteration method. Suppose an intangible asset is valued using an income capitalization method and a value of 80,000 euro pre-TAB is obtained. Suppose the asset is amortized straight line over a life of five years (20 per cent a year) and the tax rate is equal to 30 per cent. Suppose also that a post-tax discount rate of 10 per cent is used.[7] With a TAB value of about 20,000, the value of the asset would be equal to 100,000. If so, the annual amortization would be equal to 20,000 and the annual tax relief to 30 per cent of amortization, that is, 6,000. The net present value of 6,000 over 5 years, with a discount rate of 10 per cent, is equal to 22,744. Then, the value of the asset post-TAB is equal to 102,744. Now, remake the calculations on the new value, assumed equal to 102,744. The annual amortization is now equal to 20,549, from which an annual tax saving equal to 6,165 and an overall TAB value of 23,370 arises. The process can continue until, from one step to the subsequent one, the differences within the TAB value become minimal. Anyway, the adjustment of the TAB should be made only when it is possible to identify a recognizable class of purchasers, who could all benefit from tax treatments; on the contrary, a tax advantage that relates solely to the circumstances of the subject asset (and of the owning entity) is an entity-specific factor and should not be included.

For the intangible assets with an indefinite life, the direct capitalization of income is adopted. In a way similar to what happens for the evaluation of the enterprise as a whole, it is possible to adopt an analytic evaluation over a certain number of years and then add a terminal value to it. In this case, the most critical aspect concerns, without any doubt, the choice of the growth rate after the explicit forecast period. Besides what we have already said about the determination of the g factor (Chapter 2), it validates the general rule suggested by the accounting standards according to which the growth rate should not exceed the long-term average growth rate of the system relevant to the subject asset (market, industry, country). Finally, there are some considerations concerning the rate to be adopted for the discount of flows. The financial logics of reference are, naturally, the ones mentioned in Chapter 2: particularly relevant is the verification of the consistency between the nature of the flows and the nature of the rate. In fact, if flows were unlevered flows, the discount rate should express the weighted average capital cost (WACC). On the contrary, if flows were levered flows, then the most suitable discount rate would be the one that expresses only the equity cost (keL). Dealing with goodwill, in Chapter 2 we have said that the choice of unlevered flows and a keU rate, with the total neutralization of the financial variable, represents the most suitable choice for an asset evaluation: the value of the asset is not dependent on the way in which the enterprise, as a whole, finances itself and in particular on the way in which the enterprise finances the asset. A second consideration concerns the specific risk of the

asset. In Chapter 1 we have discussed the relation existing between ke and (intangible assets remuneration rate) and their convergence within the enterprise evaluation perspective. In the evaluation of the specific asset, instead, a value of the discount rate higher than the one adopted for the enterprise value is usually adopted (δ > ke): earnings from all sources are less risky than earnings from an asset. Indicatively, it is possible to identify some features of the asset that give a measurement of its returns' risk.

- Transferability, defined as the attitude of an asset to be easily transferred to other parties without a relevant loss of value (inverse relation with risk).
- Liquidity, defined as the attitude of an asset to be transformed into cash in a short while without relevant loss of value (inverse relation with risk).
- Asset's phase of life, in respect of a hypothetical life cycle. Despite the difficulties, this kind of information can give important suggestions about the stability of the intangible asset and, consequently, about its risk (the greater the stability, the lower the risk). To this information can also be added the perishability degree of the asset that has an inverse relation with risk (life cycle and perishability are concepts which are related but non-coincident).
- Versatility of an asset in respect of the different business areas and the different geographical areas (inverse relation with risk).
- Level of protection, defined as the degree of protection of an asset in respect of imitation actions by competitors (inverse relation with risk).
- Market position of an asset, defined as the robustness and defensibility of the competitive advantage to which the intangible is associated (inverse relation with risk).
- Value of investments necessary to develop the intangible asset (inverse relation with risk).

Let us remark that these features also have importance in suggesting the assumptions about the flows: therefore, it is necessary to pay attention not to duplicate the evaluation, within the flow and within the risk.

Therefore, keeping the last factor, value of investments, separate from all the others, within CAPM, the risk rate to be used for an intangible asset can be estimated in the following way:[8]

$$\delta = Rf + \beta Us(Rm - Rf) + RPiP + RPs \qquad [5.10]$$

with:

δ: discounted rate for intangible asset;

Rf: risk free rate;

(Rm–Rf): general equity risk premium;

βUs: industry Beta (unlevered);

RPiP: additional risk premium associated with intangible asset;

RPs: additional risk premium related to investment size.

***

After having clarified the basic principles, it is now possible to examine three evaluation methods based on the expected benefit, frequently adopted by the evaluation practice. In particular, we will see:

- relief from royalties method;
- premium profit method;
- multi-period excess earning method.

RELIEF FROM ROYALTIES METHOD

One of the most adopted methods is the R/R (relief from royalties), based on the annual royalties applicable in the case of brand or patent assignment, or on the royalty payments saved through owning the asset as compared with licensing the asset from a third party. Returns arising from royalties, normally coming from a percentage on gross revenues, are discounted over a period of n years, corresponding to the life of the intangible asset. Usually, the royalties flows used for the evaluation are post-tax flows: in any case, if the expected cash flow is a post-tax flow, then a post-tax rate will be used, whereas if the cash flow is a pre-tax flow, then a pre-tax rate will be used. The method is applied through the following steps:

- identification of the rate of comparable royalties;
- assessment of the subject asset's relative strength and adoption of a specific royalty rate (or range);
- estimation of the asset's life;
- estimation of the turnover to which the royalty rate is applied and assessment of its growth;
- estimation of the royalties flow's discount rate.

The first two steps characterize in a specific way the valuation method. The first step consists of correctly identifying a market value of royalties, by verifying some conditions:

- the counterparties who have made the transaction to which the market value of royalties arises should not be related and, at least, they should not have relations or constraints of a managerial or financial nature;

- the transactions considered for the royalty rate determination should be transparent (the remuneration has to be fully represented by the price and has not to be extended to indirect forms or non-monetary forms) and they should be free from conditionings;
- the assets licensed should be really comparable (nature of asset).

Once having defined the market rate, it is possible to determine the specific royalty rate to be used within the evaluation. In fact, while the market references give a first suggestion about the range of the different royalty rates applicable (R/R), only an analysis of the specific case can give the correct indication about the royalty rate to be adopted. The elements to be considered in an extensive or reductive way can change according to the nature of the asset. Among these, the following ones can be identified:

- competitive and technical differences between the asset licensed and the subject asset, such as the market position, the geographical coverage, the asset functionality, etc.;
- specific elements regarding the licensor and the licensee or their relationship (for example related parties);
- life of the licence contract compared with the expected useful life of the subject asset.

Consider as an example Table 5.4, in which the asset object of evaluation (patent) is compared with licensed similar assets, on the base of:

- technology quality;
- geographical coverage of the licence;
- licence exclusivity;
- term of licence.

Table 5.4 Estimation of Patent's Positioning

	Technology quality	*Geographical coverage of licence*	*Licence exclusivity*	*Term of licence*	*Royalty rate (% turnover)*	*Subject assets position*
Patent 1	high	USA	no	10 years	5%	+
Patent 2	medium	USA	yes	5 years	8%	similar
Patent 3	weak	UK	no	10 years	3%	++
Patent objectof valuation	high	Europe	to be valued on exclusive basis	forecast 10 years	7.5%	

Analyzing the valuations represented in the table, it is possible to obtain the positioning of the patent object of evaluation, which expresses a royalty rate equal to 7.5 per cent (a little lower than the best benchmark patent because this is traded in a wider market than the European one). The comparative analysis can be developed with different approaches. For example, as regards brands, it is possible to use brand strength analysis that characterizes the first phase of Interbrand methodology, and that is based on:

- market position (weight 25 per cent);
- customer loyalty (weight 15 per cent);
- market, industry or business area's stability (weight 10 per cent);
- internationality (weight 25 per cent);
- tendency to development in the long-term (weight 10 per cent);
- support or investments necessary to defend the brand (weight 10 per cent);
- legal protection (weight 5 per cent).

For each factor, an evaluation of the specific brand is elaborated, by using as a reference the value of the assigned weight (so, for example, in the case of the market position factor, the evaluation can theoretically range from 0 to 25). In this way, it is possible to achieve an overall evaluation expressed in hundreds. In any case, in determining the royalty rate, it is necessary to verify if the cash flow allocation between licensee and licensor coming from the royalty rate adopted is consistent with what usually happens. Suppose, for example, that the turnover, on which the royalty rate of 5 per cent is applied, is equal to 100,000 euro. Suppose, also, that the expected gross profit margin is equal to 60 per cent. All this means for the licensee:

- turnover = 100,000;
- gross profit margin = 60,000;
- royalties = 5,000;
- gross profit margin after royalty charge = 55,000, equal to 91.6 per cent of gross profit margin, to which corresponds a percentage paid by the licensee equal to 8.4 per cent of gross margin.

If the percentages identified (91.6 per cent and 8.4 per cent) are consistent with the industry practices, then the verification is successful. As regards the other operating steps, estimation of the asset residual life, estimation of the turnover and of its growth rate and determination of the discount rate, it is not necessary to introduce further reflections, in respect of what we have already said. Rather, it is necessary to verify two further possibilities:

1. in some cases, royalty payments may include an upfront lump sum in addition to periodic amounts based on turnover or some other financial parameter;

2. if the licensor is responsible for maintenance expenditure, such as advertising or maintenance research and development, the royalty rate should reflect this; if the licensee is responsible for maintenance expenditure, then the cash flow projection royalties should include these costs.

In substance, as regards this second aspect, it is necessary to verify if the royalty flow has to have the maintenance costs deducted:

$$IA = \sum_{t=1}^{n} \frac{r \times S_t - C_t}{(1 + keU)^t} \qquad [5.11]$$

where:

IA: intangible asset's value;
n: evaluation period, equal to the residual useful life of the asset;
keU: discount rate;
r: royalty's rate;
S_t: revenues arising from the intangible asset;
C_t: cost to be incurred to assure during the period n the correct use of the asset and the achieving of S (including the asset's amortization value).

Since, frequently, the subject asset, for example a brand, has an indefinite life, in practice the valuers determine the net present value of the post-tax royalty stream and then add on a perpetuity (that frequently is as much as twice the net present value of the royalty stream). So, the evaluation formula becomes the following (under the hypothesis of revenues S and costs C growth equal to 0):

$$IA_0 = \sum_{t=1}^{n} \frac{r \times S_t - C_t}{(1 + keU)^t} + \frac{r \times S_n - C_n}{keU \times (1 + keU)^n} \qquad [5.12]$$

See the evaluation represented in Table 5.5 (with analytic evaluation and terminal value).

Table 5.5 Estimation of Research Asset's Value

	2009	*2010*	*2011*	*2012*	*2013*
Revenues (steady growth 3%)	1,000	1,030	1,060.9	1,092.73	1,125.51
Royalty rate 7% (post- tax)	70	72.1	74.26	76.49	78.79
Cost of maintenance	20	20	20	20	20
Net flow	50	52.1	54.26	56.49	58.79
Discounted rate, equal to 10%	0.91	0.83	0.75	0.68	0.62
Discounted flow	45.5	43.24	40.69	38.41	36.45
Value of the analytic period evaluation	204.30				
Terminal value	364.47				
Subject asset's value	568.77				

PREMIUM PROFITS OR INCREMENTAL INCOME METHOD

The premium profit method, also called incremental income, is based on a differential analysis, which has already been described in general terms. The value of the intangible asset is determined in relation to the advantages that are generated by its possession (in terms of greater revenues or lower costs). Let us assume for example that we evaluate a brand, considering first of all the profit after tax of the enterprise using it. The enterprise obtains a profit after tax in the last year of analysis equal to 100. An enterprise operating in the same business without a brand support is identified. If this unbranded enterprise obtains a profit after tax equal to, say, 80, then the premium profit after tax obtained using the brand is equal to 20. At this point, using specific multiples or capitalized profit, it is possible to determine the value of the brand (including TAB adjustments). It may result for example that the comparable enterprises are quoted in the market at 10 times profit after taxes and that given the particular strength of the brand it is possible to apply a multiple equal to 12 (+20 per cent), with a final result (before TAB adjustments) of 240 (12 × 20). As we have already seen, in the valuation of intangible assets it is always necessary to identify and neutralize all entity-specific factors: this aspect is particularly critical when differential methods are used. These factors in fact influence the result that can be obtained using the intangible asset, although they are not directly attributable to this, but rather to the overall enterprise system. Therefore for example the capital cost of the enterprise may not be suited to the valuation of the individual asset, since it represents a measure of the general enterprise risk and not of the risk attributable to the flows generated by the individual stand-alone asset. What most of the time is rather complex in the application of the method is the identification of enterprises that are simultaneously comparable and devoid of the asset that one wishes to valuate. Generally speaking it is possible to adopt different solutions depending on the case at hand.

- In some instances it is possible to identify a comparable business in the market, as hypothesized in the example. It is however necessary to have also information relative to the turnover and margins of the competitor.
- Sometimes the same enterprise operates in a business area with the asset to be valuated and without it. For example, an enterprise may operate in the clothing industry with both branded and unbranded products. In this case all necessary information can be easily acquired.
- In other instances an effort is made to apply the method introducing some hypotheses on the results that could be obtained if the asset being valuated were not available. This is the logic that has been adopted in Chapter 4 to valuate the competitive capabilities implicit in business goodwill and corporate goodwill values. This solution in general can be adopted for intangible goods of a technological kind or for example for non-compete agreements.

In any case, the differential method requires the development of adequate benchmarking analyses, as stated in the previous sections.

MULTI-PERIOD EXCESS EARNING METHOD (MEEM)

The Multi-Period Excess Earning Method consists of determining the cash flow arising from the intangible asset by identifying its specific contribution in respect of a set of assets to which the intangible is related. In particular, the application of the MEEM method is articulated into the following steps:

1. forecast of a post-tax cash flow obtainable from a complex of assets (for example from a CGU) among which the intangible asset is also included;
2. identification of the contribution to the cash flow that is made by assets, physical and intangible, other than the subject intangible asset: this contribution is called Contributory Asset Charge (CAC);
3. determination, through difference, of the cash flow attributable to the subject intangible asset;
4. estimation of an appropriate discount rate, through the usual criteria, for the determination of the net present value of the subject intangible asset;
5. determination of the TAB.

The determination of the CAC represents the most relevant and distinguishing part of this approach. It is composed, at least from a logical point of view, of three steps:

1. identification of the assets (or groups of assets); (according to the American Institute of Certified Public Accountants [AICPA] Practice Aid, assets can be grouped as working capital, fixed assets, intangible assets and workforce-based intangible assets and they can also include goodwill);
2. valuation of their fair value;
3. estimation of an appropriate rate of return in respect of the assets' value, considering that the CAC is established through the determination of both the fair return required on the capital value of assets and the regular recovery of its initial value over its estimated useful life.

The third step is usually the most difficult: furthermore, to each group of assets correspond different and specific evaluation logics. Leasing agreements, for example, are often considered for the fair return of the material fixed assets, interest rates in bank lending (with an appropriate term) are adopted for the working capital, royalty rates are used for intangible assets, and so on. It is also useful to determine the WARA (weighted average rate

of return), obtained as the ratio between the sum of the CAC and the overall value of the assets: the WARA should not be too different from the keU or from the WACC of the business that employed the assets.

Let us see an example of an evaluation developed according to this methodology. Suppose the value of a set of customer relationships is estimated. This asset is allocated within a group of assets that includes:

- fixed physical assets;
- working capital;
- trademarks.

The cash flow of this set of assets, determined over an annual basis, is equal to 14. In Table 5.6, the fair value of the specific assets, the fair return on and of such assets and the CAC of each group are estimated Dividing the overall value of the CACs (9.5) by the overall value of the assets (130), a WARA equal to 7.3 per cent is obtained, which is supposed to be consistent with the business's keU. In Table 5.7, the cash flow annual quota associated with the subject asset is determined, through difference.

The multi-period excess earning is adopted to evaluate intangible assets that can hardly be evaluated with alternative methodologies, or, at least, intangible assets that have strict links with other assets. It is usually applied to the research and development process (IPR&D), to customer contract and to customer relationship. Moreover, its adoption depends on the possibility of identifying in the value creation a key asset, according to the dominant principle that has been described at the beginning of the chapter.

Table 5.6 Estimation of Fair Value of Assets, Fair Return on and of Such Assets and the CAC

	Fair value of assets	*Fair return on and of such assets*	*CAC*
Fixed physical assets	80	7%	5.6
Working capital	30	5%	1.5
Trade marks	20	12%	2.4
	130		**9.5**

Table 5.7 Cash Flow from Subject Asset

Cash flow from business	14
CAC in respect of fixed physical assets	(5.6)
CAC in respect of working capital	(1.5)
CAC in repsect of trade marks	(2.4)
Cash flow from subject asset	4.5

CHOICE CRITERIA AND EVALUATION METHODS

Although the methodologies examined are the most known and the most adopted, they do not exhaust the overview of the possible approaches.

- In some industries, the build-out or greenfield approach is often used (in the valuation of telecommunication licences). It is a derivative of the income approach, in which the value of the subject asset is based on the value of a hypothetical start-up company with no assets except the asset to be valued. The value of the subject asset is equal to the value of the hypothetical start-up entity.
- In the 'formula approach' (a method belonging to the excess earning approaches), a percentage return on the average annual value of tangible assets is determined, using a period of not less than five years prior to the valuation date, and a rate of return from 8 to 10 per cent. The difference between the average earning of the business as a whole for such a period and the percentage return on tangible assets is considered the average annual earning of intangible assets (in the period under consideration). This amount is capitalized, at a discounted rate of 15 to 20 per cent.[9]
- Premium pricing is a differential method according to which the value of the subject asset is determined on the basis of the premium price of the product or service that benefits from the subject asset, compared with the prices of a generic product or service.
- Within the cost saving approach, the value of the intangible asset is obtained from the costs saving after tax attributable to the intangible asset (used for the evaluation of advantageous contracts or workforce).
- Under specific conditions and under specific investments (for example R&D investments), alternative approaches are suggested, in particular, the real option valuation approach or the decision tree approach: normally, these methods are used to integrate the main evaluation approach, based on the cost approach or, more frequently, the income approach.

The variety of the evaluation techniques, at least potentially adoptable, leads to a reflection about the criterion on the basis of which to choose the most appropriate method or methods. Also, the accounting standards deal with this problem. The IAS 38, making specific reference to the intangible assets acquired in a business combination, suggests the following:

- the active market, where existing, is the best reference to evaluate an intangible asset, because it allows the use of quoted market prices;
- since it is difficult to find an active market for intangible assets, the IAS 38 suggests referring, if possible, to comparable transactions;
- other evaluation techniques can also be used, on the condition that they are consistent with the practice of the industry in which the asset is used; let us remember the multiples method, the relief from royalty method and the discount expected future cash flow method.

At a more general level, the SFAS 157 (Fair Value Measurements) defines a hierarchy of evaluation approaches (which can also be extended to intangible assets) based on the nature of the informative input usable:

- at the first level there are methods based on the quoted prices in active markets;
- at the second level, methods based on informative input that are observable, such as, for example, the usage period of an asset contractually defined or the risk-free rate to be applied to a cash flow; these inputs are observable because they depend on the market data obtained from sources independent of the reporting unit;
- at the third and last level there are evaluation methods based on non-observable informative inputs (depending exclusively on assumptions made by the entity).

Since market information for the intangible assets is limited, the evaluation process is developed most of all at the third level identified by the SFAS 157. Practically, except for some cases (for example the cost approach for software, the market approach for water rights or taxi licenses, the sales comparison approach for patent and brands), evaluations of intangible assets are developed, most of all, with the income method, because:

- active markets are essentially non-existent;
- the number of adjustments that it is necessary to adopt in the case of the sales comparison approach is so relevant to make the evaluation relatively unreliable;
- the replacement cost of an intangible asset can hardly be estimated, because of the absence of market information (or observable information, in the meaning defined by the SFAS 157).

In any case, the proceeding suggested by the IVSC seems to be acceptable, and can be summarized in the following way (IVSC 2007):

1. if possible, let information coming from a market be used, even if it is a non-active market;
2. let all the other methods available be adopted according to the available information and the nature of the intangible asset;
3. if possible, the results achieved using the specific method should be verified by the development of evaluations based on alternative methodological approaches.

On the whole, there is a lot of information that has to be obtained in the evaluation, with a level of depth that varies according to the methodologies adopted:[10]

- the nature and history of the asset;
- historical financial statements related to the asset;
- the rights, privileges or conditions that are attached to the ownership interest;
- the remaining economic life and, if any, legal life;
- the earning capacity and the risk conditions;
- the economic outlook that may affect the subject assets;
- the condition and outlook of the specific industry;
- the market prices for the acquisition of intangible assets (or similar intangible assets);
- other market data;
- prior transaction in ownership interest of the subject intangible assets.

IN BRIEF

In this chapter, we have examined the last breakdown scheme of the going-concern goodwill, concerning the identification and evaluation of the intangible assets not recorded in accounting. This breakdown scheme allows us to identify, within the overall goodwill value, some intangible assets that, even though not recognized by the accounting, have such features to make an extra-accounting evaluation possible. In this way, goodwill value results from the sum of the value of all the intangible assets autonomously evaluated (and not recorded) and a residual value, defined reduced goodwill. Figure 5.1 suggests the breakdown scheme at entity level, even if it can also be developed at business or corporate goodwill level.

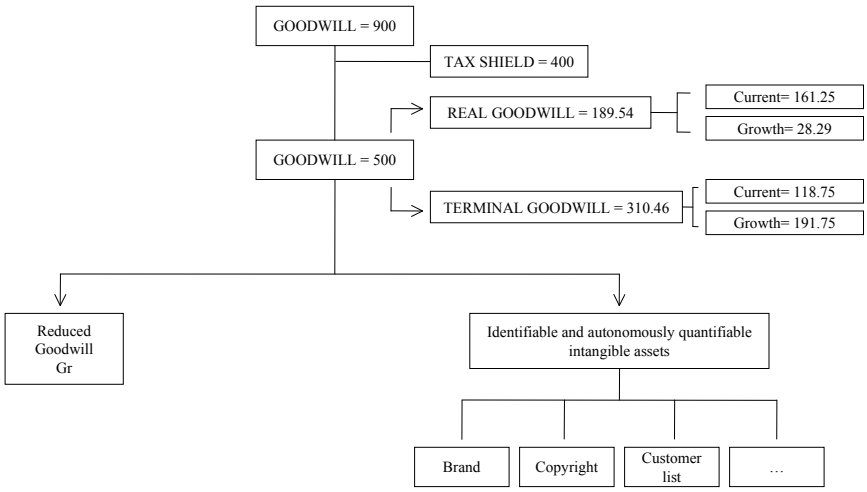

Figure 5.1 In brief.

6 Integration of the Different Breakdown Approaches

BREAKDOWN SCHEMES: A SYNTHESIS

The process of goodwill breakdown has been developed through the following breakdown schemes:

1. estimation of tax shield's value (Chapter 2);
2. evaluation of real goodwill and terminal goodwill (Chapter 2);
3. assessment of current and growth goodwill (Chapter 2);
4. valuation of business goodwill, corporate goodwill and risk compensation effect (Chapter 3);
5. within business goodwill, determination of system goodwill and positional goodwill (with income effect and risk effect) (Chapter 4);
6. determination of distinctive capabilities' value (Chapter 4);
7. assessment of autonomously evaluable intangible assets and evaluation of reduced goodwill (Chapter 5).

The breakdown logics can be developed at different levels (entity as a whole, corporate, business) as shown in Table 6.1.

Table 6.1 Breakdowns Levels

Breakdown	*Entity as a whole*	*Corporate*	*Business*
1 Tax shield	X		
2 Real/terminal goodwill	X	X	X
3 Current/growth goodwill	X	X	X
4 Business goodwill/ corporate goodwill	X		
5 RCE	X		
6 System/positional goodwill			X
7 Distinctive capabilities	X	X	X
8 Intangible assets autonomously evaluated	X	X	X

The breakdown of goodwill into current and growth goodwill, for example, can be realized at every level, whereas the breakdown of goodwill into system and positional goodwill can be developed only at business level. The detail and the articulation of the breakdown process depend on the economic nature of the enterprise and on the quality and quantity of the information available. The suggested breakdown schemes are of two kinds:

- the first five comprise the deepening of the general conditions under which goodwill is determined (tax shield, real/terminal, current/growth, business/corporate/RCE, system/positional);
- the last two allow the autonomous evaluation of specific resources, i.e., intangible assets or distinctive capabilities.

Apart from the methodological aspects, the main difference between the two breakdown logics is represented by the fact that whereas the evaluation of intangible assets and distinctive capabilities directly contributes to the determination of the resources portfolio's value (Chapter 4), the other breakdown logic allows deepening of the economic conditions to which the goodwill value is traceable, disclosing, for example, the role played by a business in respect of the role played by another business or underlying the relevance of a competitive advantage or the role of the expected growth within the profitability. The different approaches are focused on a unique object, the goodwill, even though they adopt specific perspectives of analysis: to integrate the different breakdown logics means ability to give a unitary reading of the information obtainable from each specific perspective of analysis. This integration is possible only through the comprehension of the links between the different goodwill breakdown schemes.

RESOURCES PORTFOLIO

The resources portfolios, with which we have already dealt in Chapters 4 and 5, are conceptual instruments useful for understanding the links between the different components of the goodwill and the breakdown schemes developed in this work: particularly relevant is the relationship between capabilities, assets and resources portfolios. The resources portfolios available to enterprises are the following ones:

- portfolio of technologies;
- portfolio of techniques;
- portfolio of client relationships;
- portfolio of stakeholder relationships;
- portfolio of aesthetic attitudes.

Figure 6.1 shows the existing links between enterprise capabilities, assets, resources portfolios and enterprise value.

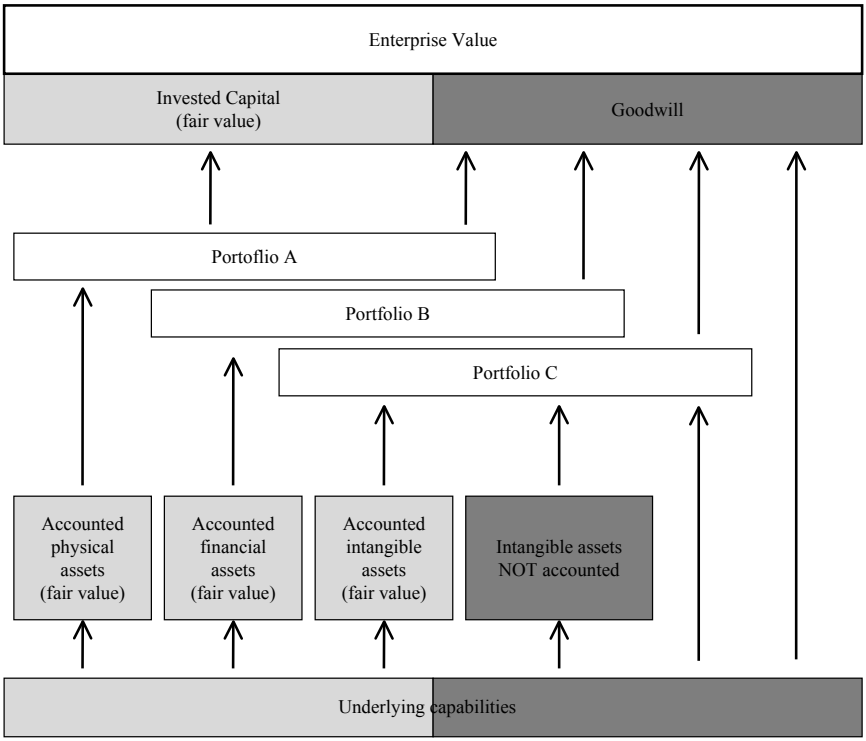

Figure 6.1 Relationship among enterprise value, assets portfolio and capabilities.

Interpreted in a broad sense (Chapter 4), the enterprise capabilities represent a basis for understanding the origin of every resource owned by the enterprise, and they also represent a basis for determining the overall value attributable to its assets (goodwill included). Generically, it is possible to state that the enterprise value is the value attributed to the complex of enterprise capability (financial capabilities, technological capabilities, professional capabilities, etc.). So, capabilities give rise to the assets, starting from the ones recorded by the accounting (of physical, intangible and financial nature) which on the whole give rise to the invested capital book value (to be expressed, as we have already seen in the previous chapters, at fair value). In the fair value of the accounted assets the value of capabilities finds a clear expression, and the allocation of these assets to the resources' portfolios of the enterprise does not represent a problem (except for the fair value assessment, not always easy to determine). Furthermore, it is possible to evaluate some intangible assets that are not accounted but that are autonomously valuable. Also in this case, the link existing between the asset and the specific capability is clearly determinable. With these assets we are in that area of the enterprise value represented by the 'reduced' goodwill. In the end,

the existence of a part of the goodwill that does not correspond even with the intangible assets not accounted means that a part of the capabilities' value does not express itself in assets autonomously valuable. In this case there can be two possibilities.

- It is possible to determine, with a suitable degree of approximation, the value of a distinctive capability through the differential method (see Chapter 4). Since it happens only if it is possible to identify clearly the nature of the distinctive capability, then an evaluated capability can also be allocated to its related resources' portfolio, even if it has no direct links with specific assets but only with goodwill.
- It is not possible to evaluate the capability, because of the difficulty in the adoption of the differential method or because of the difficulty in the definition of the capability: this phenomenon gives rise to that part of the goodwill that is not possible to explain, neither with assets nor with autonomously valuable capabilities.

To recap, from the evaluation's perspective the capabilities can be treated in one of the following ways:

1. their value is already included in an asset, physical, financial or intangible (even unrecorded);
2. the capability is evaluable in an autonomous way, even if it has no direct links with specific assets, so it can be allocated to one of the enterprise's portfolios;
3. the capability cannot be evaluated in an autonomous way and consequently it cannot be allocated to one of the enterprise's portfolios.

Figure 6.2 exemplifies the relationship between a resources portfolio, the client relationships' portfolio, say, and the enterprise value. The portfolio, as a whole, explains part of the value of the invested and recorded capital (fair value) and part of the goodwill: in fact, the resources allocated to the portfolio, recorded assets, unrecorded assets and capabilities, have a strong link with the different components of the enterprise value. The percentages in Figure 6.2 represent an example of the conclusive information obtained through the allocation to the portfolio:

- the portfolio of client relationship has a value equal to 60 per cent of the enterprise value (10% + 20% + 30%);
- the fair value of accounted physical assets, which represents 30 per cent of the portfolio's value, is 10 per cent of the invested and recorded capital;
- the intangible assets not recorded represent 30 per cent of the portfolio's value and 20 per cent of the goodwill value;

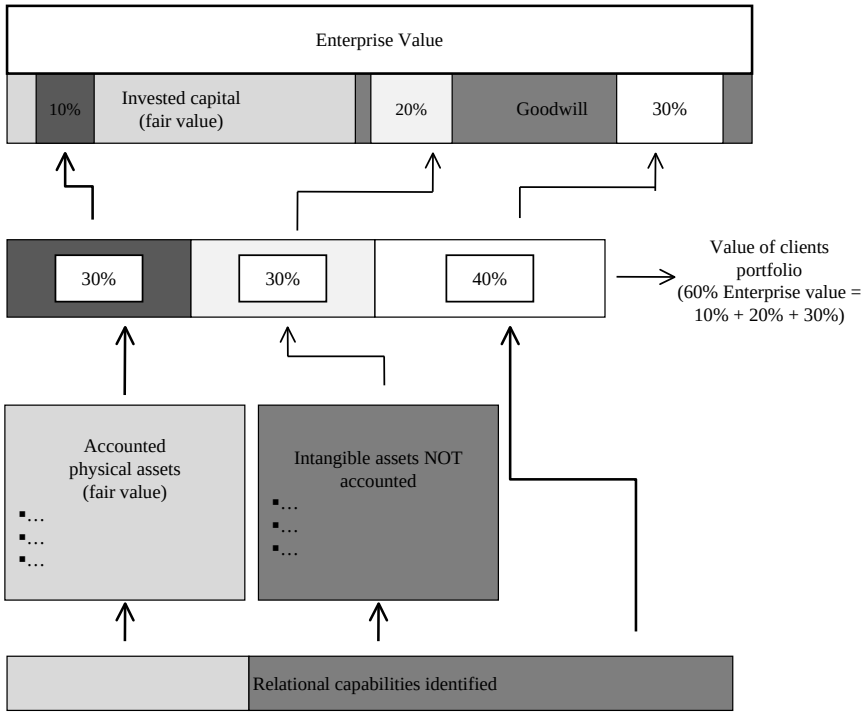

Figure 6.2 Value of client's portfolio.

- the autonomously evaluable capabilities correspond to 40 per cent of the portfolio's value and to 30 per cent of goodwill value.

Note that in this hypothetical situation 50 per cent of the overall value of the goodwill is broken down into assets and specific capabilities belonging to an enterprise's portfolio: the residual 50 per cent should be traced to other portfolios or to capabilities not allocable to enterprise portfolios.

AN OVERVIEW OF THE BREAKDOWNS

The allocation of resources to portfolios allows us to apply the different breakdown logics to a synthesis judgement about the sustainability of the goodwill value. To this end it is possible to adopt all the breakdown logics developed in the book. Consider Figure 6.3: in this hypothetical situation some intangible assets (unpatented know-how) and some distinctive capabilities (design capabilities) are identified. The goodwill breakdown schemes allow us to establish a connection between the assets, the capabilities and:

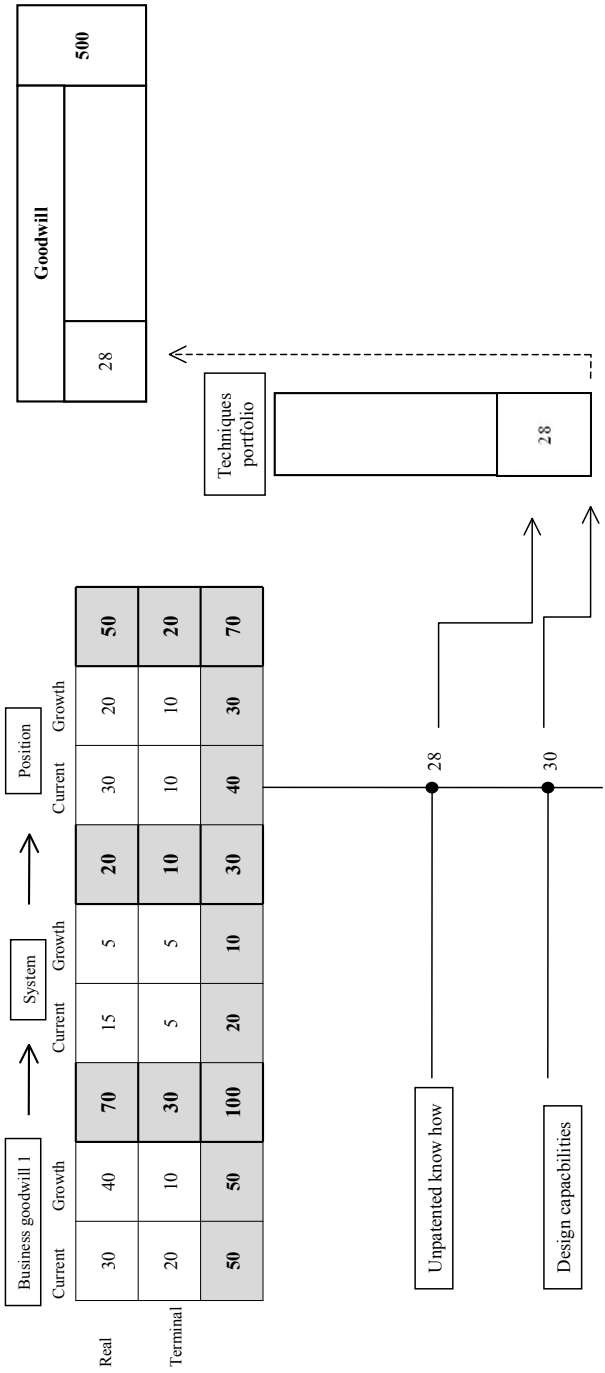

Figure 6.3 An overview of the breakdowns (1).

- the business number one;
- the positional goodwill;
- the current component of the goodwill.

The connection is determined both for the nature of the capability and autonomously evaluated intangible assets and for the choices assumed during the evaluation process: if, for example, the intangible asset was evaluated with the royalty method, assuming a flow not subjected to any growth during the time, then it would be possible to establish a connection between the value of the asset and the current component of the goodwill. Note that these connections also allow us to introduce a compatibility verification between the hypothesis that has led to the values of assets/capabilities and the hypothesis that has led to the goodwill breakdown values (business, positional, system, real, terminal, current, growth).

Let us consider the allocation of the resources to the techniques' portfolio. Let us assume that the design capability is the basic capability from which the unpatented know-how asset rises. In other words, the design capability finds its full expression (with a minimal and irrelevant value's difference) into the autonomously evaluated intangible asset. Then, in the portfolio, it is not allocated 30 + 28 but only 28. Obviously, the opposite case is also possible, which is the one in which capabilities and intangible assets are completely autonomous; this case, all else being equal, is represented in Figure 6.4.

Coming back to Figure 6.3, we see that the overview of the different breakdown logics allows us to state that part of the overall goodwill, that is, 28 of 500:

- rises within the business goodwill number one (equal to 100);
- is traceable to some competitive advantage conditions in business one (positional goodwill, which is in all equal to 70);
- takes shape in the current evaluation dimension (and not in the growth dimension);
- finds its full expression in an autonomous asset (unpatented know-how) that rises from an autonomously evaluable distinctive capability (design capability);
- is allocated to the enterprise techniques portfolio.

Instead, the steps followed to articulate this evaluation using the different breakdown logics have been the following ones:

- definition of the connection between the different breakdown logics, and in particular between capabilities/intangible assets and the goodwill broken down into real/terminal, current/growth;

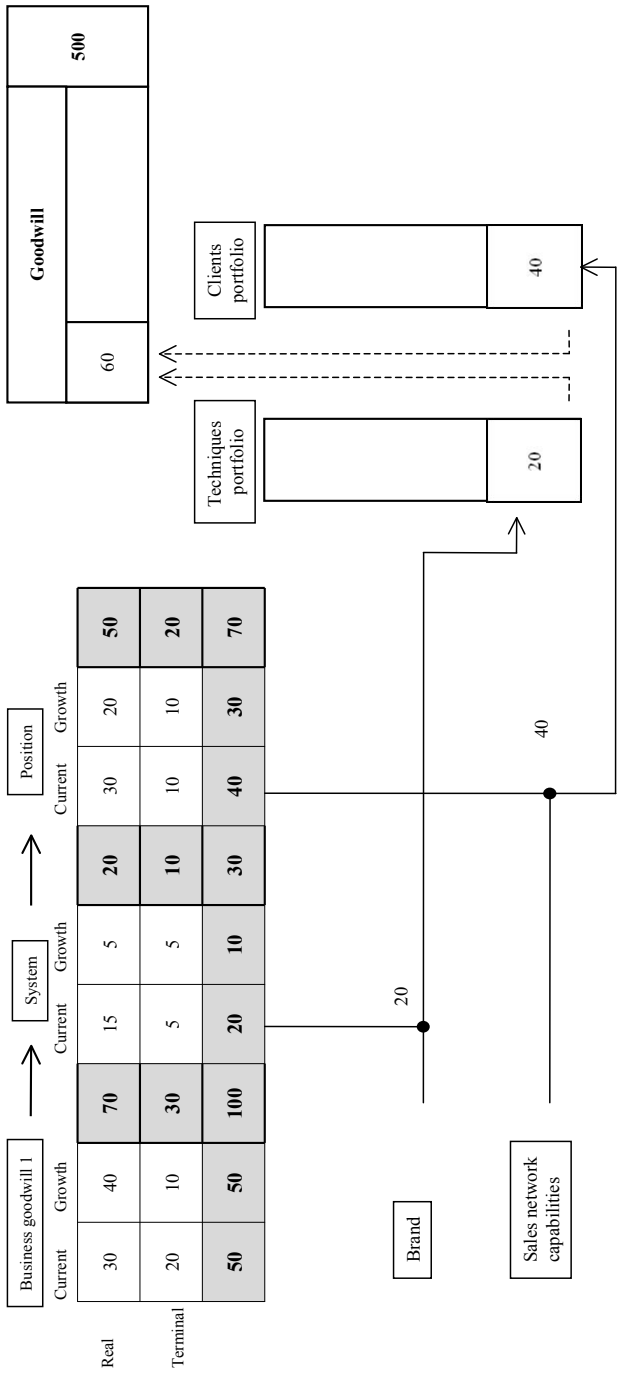

Figure 6.4 An overview of the breakdowns (2).

- verification of the compatibility between the connected values (capabilities/assets and real/terminal/current/growth), that is, verification of the consistency between the basic hypothesis assumed for their determination;
- allocation of capabilities and autonomously evaluated intangible assets to the resources portfolios.

IN BRIEF

The different breakdown logics give different perspectives of analysis that can be integrated into an overview of the overall process. The integration enriches the goodwill evaluation, making clearer the underlying economic and competitive dynamics. It also allows us to verify the evaluative reliability of each breakdown logic and, consequently, the reliability of the overall goodwill value.

Appendix

Breaking Down the Goodwill Emerging from an Italian Business Combination

By Silvia Vernizzi[*]

AIMS AND METHODOLOGY OF THE ANALYSIS

This appendix focuses on a business combination that involved two large Italian bank groups in the course of 2007, namely, Unicredit and Capitalia. Our purpose is to:

1. evaluate the internally generated goodwill of the acquired entity (Capitalia);
2. analyze this value in the light of a breakdown process aiming at identifying:
    i. the portion of internally generated goodwill that comes from an analytical projection of the flows of abnormal earnings expected in a fixed-term period (real goodwill) and the portion for which this projection is not realistically possible (terminal goodwill);
    ii. the portion of real goodwill and terminal goodwill values that implies a growth with respect to current conditions (growth goodwill) and the portion that implies no growth (current goodwill);
    iii. the source of goodwill in relation to the various strategic areas in which the enterprise operates.

We will carry out, therefore, a partial breakdown, which will only concern the analysis of the general conditions underlying the goodwill of Capitalia. For that reason this breakdown does not take into account the autonomous evaluation of specific resources, such as intangible assets or distinctive capabilities. Before going on to the quantification and interpretation of the goodwill emerging from the business combination of concern, a few preliminary considerations of a methodological kind should be made regarding in particular the procedure employed to determine the goodwill, the valuation logic adopted and the information sources used . The method applied to estimate the internally generated goodwill of Capitalia is of an indirect kind. This procedure is substantially based on the observation that

since goodwill is an element of the overall value of the enterprise, then, with VME being the equity market value and B being the equity book value, the goodwill G can be obtained as a difference:

$$G = VME - B$$

Given the peculiarity of the financial structure of a bank, the evaluation logic adopted is of an equity side kind, based, therefore, on the direct estimate of the economic value of the equity. Finally, as regards the information sources, this analysis will be primarily based on public information and, where it is needed, will introduce a few work hypotheses. The values arising from these hypotheses do not expect to be objectively accepted but their purpose is rather to provide, within a reasonable and consistent framework, a possible interpretation of the factors underlying the goodwill emerging from the business combination.

DETERMINATION OF EQUITY MARKET VALUE, EQUITY BOOK VALUE AND INTERNALLY GENERATED GOODWILL

The market value of equity can be defined as the result of the multiplication of the number of shares of the company being evaluated by the unit value of each share. This can be formulated as follows:

$$\text{VME} = \text{number of shares} \times \text{unit value}$$

The seeming simplicity of such formulation actually hides a few critical elements concering:

- the number of shares to be considered in the determination of the enterprise's market value of equity (which date should be taken as a reference);
- the unit value of the shares, which may differ based on the type of method used to determine it.

As regards the choice of the number of shares, reference is made to the data indicated in the balance sheet of Capitalia as of 31 December 2006. As of the closing date of the fiscal year, the share capital of Capitalia consisted of 2,595,439,085 shares of one euro each. The determination of the unit value of the shares is based, instead, on the information that can be inferred from the information note on the merger and attachments thereto which exhaustively describe the methods used by the directors and consultants to determine the share-swap and to express an opinion on its adequacy. These methods, subdivided into main methods and control methods, have been adopted based on a stand-alone view, that is, hypothesizing the operational autonomy of the two banks irrespective of any effects connected to

Table 1 Results Arising from the Evaluation Made by Different Evaluating Subjects

Evaluating subject	*Value of shares (€)*	
	Min	*Max*
UniCredit	6.56	7.22
Capitalia 1	6.66	7.08
Capitalia 2	6.76	7.10
Capitalia 3	6.69	7.25

the wider industrial project. Given their specificity, however, the various applied methodologies lead to the determination of inhomogeneous values of the shares. The results in fact differ as an effect of both the applied method and the evaluating subject. Table 1 shows the results emerged from the evaluation made by the different evaluating subjects.[1]

With the objective of determining Capitalia's equity market value, it is necessary to identify, based on the above-indicated results, a meaningful synthetic value that could be used, in the analysis of concern, for the determination of VME. For the identification of this value we should first of all calculate the arithmetic mean of the (minimum and maximum) values resulting from the application of the individual stand-alone methods on the part of the various evaluating subjects, summarized in Table 1, thus obtaining an interval, for the main methods, within a range of € 6.67 (minimum value) and € 7.16 (maximum value) per share (Table 2).

Table 2 Arithmetic Mean of the Values Resulting from the Application of the Individual Stand- Alone Methods

Evaluating subject	*Value of shares (€)*	
	Min	*Max*
Main methods		
Unicredit	6.56	7.22
Capitalia 1	6.66	7.08
Capitalia 2	6.76	7.10
Capitalia 3	6.69	7.25
Arithmetic mean	6.67	7.16
Control method		
Unicredit	6.17	6.82
Capitalia 1	6.90	7.90
Capitalia 2	6.90	7.90
Capitalia 3	6.90	7.90
Arithemetic mean	6.72	7.63

Furthermore, since Capitalia shares, prior to the aggregation, were listed in the stock exchange, the trade values in the three months before 8 May 2007 are considered, i.e., the day on which Capitalia's Board of Directors resolved on the conferment of a consulting service agreement for the evaluation of the various strategic options, and which is considered, therefore, the last day of negotiations not influenced by speculative tensions. In particular, considering the period between 7 February and 7 May 2007, the following can be inferred:

- the minimum trade price of Capitalia shares was in the amount of: € 6.21 (16 March 2007);
- the maximum trade price of Capitalia shares was in the amount of: € 7.23 (16 April 2007);
- the average closing price of the shares in the considered interval was in the amount of € 6.81.

In the light of this information, we can confidently consider as a synthetic value of Capitalia shares the average closing price of the shares in the time period between 7 February and 7 May 2007, in the amount of € 6.81. This value is consistent with the range of values resulting from the arithmetic mean of the main evaluation methodologies (6.67–7.16) and with the interval of values resulting from the application of control methods (6.72–7.63) (shown in Table 2). Once the number of shares and the unit value to be attributed to these have been estimated, it is possible to determine Capitalia's equity market value:

$$VME = 2{,}595{,}439{,}085 \times 6.81 = 17{,}674{,}940{,}169.^{2}$$

The more some distortion effects caused by the accounting procedures are identified and eliminated in the determination of the book value of the enterprise capital, the greater is the significance of the goodwill value determined in a differential way. Therefore, from a theoretical standpoint, in order to obtain a meaningful goodwill value, it would be necessary to review the balance values and subsequently, to express them in current values. Despite the theoretical correctness of these remarks, in the analysis of concern it is hypothesized, simplifying, that the adoption of the International Financial Reporting Standards and of the principle of the fair value evaluation limits the distortion effects of the accounting procedures and their possible influence on the equity book value. Based on this hypothesis, the value that can be inferred from Capitalia's balance sheet as of 31 December 2006, in the amount of 9,717,129,000, is assumed to be the equity book value. Once the equity market value (VME) and the equity book value (B) have been determined, it is possible to obtain a value for the internally generated goodwill (G) of:

$G = VME - B$

17,674,940,169–9,717,129,000=7,957,811,169

The objective of the following sections is the interpretation, through a breakdown process, of the value so determined.[3]

BREAKING DOWN THE GOODWILL VALUE: REAL GOODWILL AND TERMINAL GOODWILL

The first breakdown of the goodwill value in this analysis aims at differentiating the portion that results from an analytical projection of the flows of abnormal earnings over a definite period of time (real goodwill, GR) and the portion for which this projection is not realistically possible and that comes from a synthetic value, conventionally defined terminal goodwill,(GT). In this way, the total goodwill value can be broken down as follows:

$G = GR + GT$

in which:

$$GR_0 = \sum_{s=1}^{\infty} \frac{[x_s - (ke \times B_{s-1})]}{(1+ke)^s}$$

where:

x_s: net income in the s accounting period;
ke: cost of equity;
B_{s-1}: equity book value at the end of s–1 period.

and GT varies based upon the hypotheses regarding growth factor g. In particular, under the steady growth hypothesis:

$$GT = \frac{[x_S - (ke \times B_S)] \times (1+g)}{(ke-g) \times (1+ke)^S}$$

while, under the multi-stages growth hypothesis:

$$GT = \frac{[x_S - (ke \times B_S)] \times \left[1 - \frac{(1+g_1)^S}{(1+ke)^S}\right]}{ke - g_1} + \frac{[x_{S+1} - (ke \times B_S)]}{(ke - g_2) \times (1+ke)^S}$$

Let us start with the calculation of the real goodwill for which it is necessary to define:

- the period of analytical prediction;
- the cost of equity;
- the value assumed by abnormal earnings in the reference time period.

For the definition of the period of analytical prediction, a time frame of three years is considered (2007, 2008, 2009), in relation to which, based on the projections of financial analysts, it is possible to obtain the expected variations in the net income and equity book value.[4] In particular, in the considered three-year period, the average positive variation in the net income is expected to be equal to 16.2 per cent while the positive variation in the equity book value is expected to be 8.8 per cent. The cost of equity determined as the arithmetic mean of the different values of ke indicated in the reports of the directors and consultants has been defined to be equal to 9.8 per cent.[5] Making assumptions with reference to the expected net income and the equity book value for the first year of analytical projection, it is possible, in the light of previous considerations, to obtain a real goodwill value as indicated in Table 3:
Based on the values indicated in the table, the real goodwill value is equal

Table 3 Real Goodwill and Terminal Goodwill

Years *s*	*x*	*B*	*Rate*	*(1 + rate)^s*	*Cost of equity Z (rate × B_{s-1})*	*Abnormal earnings (x – cost of capital)*	*Discounting abnormal earnings*
0	1,100,000,000	9,700,000,000					
1	1,276,000,000	10,553,600,000	0.098	1.098	950,000,000	325,400,000	296,357,013
2	1,480,160,000	11,482,316,800	0.098	1.206	1,034,252,800	445,907,200	369,862,077
3	1,716,985,000	12,492,760,678	0.098	1.324	1,125,267,046	591,718,554	447,000,662
							1,113,219,753

to 1,113,219,753 (approximately 14 per cent of the total goodwill value) obtained as the sum of discounted abnormal earnings in the reference time period. Once the real goodwill value has been determined, the terminal value GT can be estimated, which reflects the value generated by the enterprise after the period of analytical prediction. Since the sum of real goodwill and terminal goodwill is equal to the total goodwill value, then:

$$GT = G - GR$$

$$7{,}957{,}811{,}169 - 1{,}113{,}219{,}753 = 6{,}844{,}591{,}416$$

which is equal to approximately 86 per cent of the total value. The so determined GT value may come from different terminal flows of incomes and consequently of abnormal earnings, which vary based on the type of

hypothesis regarding growth factor g. Let us assume, first of all, a steady growth hypothesis with a growth factor g equal to 2.3 per cent.[6] Applying the following formula:

$$\mathrm{GT} = \frac{[x_S - (ke \times B_S)] \times (1+g)}{(ke-g) \times (1+ke)^S}$$

and rewriting it as follows:

$$x_S = \frac{GT \times (ke-g) \times (1+ke)^S}{(1+g)} + (ke \times B_S)$$

a terminal flow of net income equal to 1,888,553,723 will result, as well as a terminal flow of abnormal earnings as shown below:

$$[x_S - (ke \times B_S)] = \frac{GT \times (ke-g) \times (1+ke)^S}{(1+g)}$$

which is equal to 664,263,177. In fact:

$$GT = \frac{(664{,}263{,}177) \times (1+0.023)}{(0.098-0.023) \times (1+0.098)^3} = 6{,}844{,}591{,}416$$

Let us now assume, instead, that the growth process can be subdivided into two distinct periods: a period of intense growth, which however weakens or diminishes in a few years, and a period characterized by moderate development. In the light of the above considerations, it is hypothesized that the growth process of the bank being evaluated is relevant in the 2010–2016 time period, with a factor g_1 equal to 3.5 per cent, while for the subsequent period a growth rate g_2 equal to approximately 1.5 per cent is assumed. Based on the above scenario, it is possible to break down the terminal goodwill into two components represented as follows:

$$\mathrm{GT}_1 = \frac{[x_S - (ke \times B_S)] \times \left[1 - \frac{(1+g_1)^S}{(1+ke)^S}\right]}{ke - g_1}$$

$$\mathrm{GT}_2 = \frac{[x_{S+1} - (ke \times B_S)]}{(ke-g_2) \times (1+ke)^S}$$

Now, assuming that the abnormal earnings of the first period $[x_S - (ke \times B_S)]$ and the abnormal earnings of the second period $[x_{S+1} - (ke \times B_S)]$ are related as follows:

$$[x_{S+1} - (ke \times B_S)] = [x_S - (ke \times B_S)] \times (1+g)^S$$

and placing this relation in the formula that assumes the hypothesis of multi-stages growth

$$GT = \frac{[x_S - (ke \times B_S)] \times \left[1 - \frac{(1+g_1)^S}{(1+ke)^S}\right]}{ke - g_1} + \frac{[x_{S+1} - (ke \times B_S)]}{(ke - g_2) \times (1+ke)^S}$$

we can obtain a terminal value of the abnormal earnings of the first period of 512,939,375 and a terminal value of the abnormal earnings of the second period of 652,602,130. Now that these values have been defined, it is possible to determine the portion of the terminal goodwill that can be attributed to the first period of time, characterized by a growth of 3.5 per cent:

$$GT_1 = \frac{[512{,}939{,}375] \times \left[1 - \frac{(1+0{,}035)^7}{(1+0{,}098)^7}\right]}{0{,}098 - 0{,}035} = 2{,}758{,}062{,}136$$

and the portion of the terminal goodwill that is related to the second period of time, characterized by a growth of 1.5 per cent:

$$GT_2 = \frac{[652{,}602{,}130]}{(0{,}098 - 0{,}015) \times (1+0{,}098)^7} = 4{,}086{,}523{,}625$$

$$GT_2 + GT_1 = GT$$

$$2{,}758{,}062{,}136 + 4{,}086{,}523{,}625 \sim 6{,}844{,}591{,}416$$

Based on these results, we can see that in the multi-stages growth hypothesis, 40 per cent of the value of the total terminal goodwill, in the amount of 6,844,591,416, can be attributed to the goodwill generated by the terminal abnormal earnings in the period characterized by highest growth and the remaining 60 per cent of it can be attributed to the goodwill generated by the terminal abnormal earnings of the period characterized by a lower growth.

CURRENT GOODWILL AND GROWTH GOODWILL

The analysis of real and terminal goodwill can be further developed to see which part of the two values implies a growth, in respect of the current conditions, and which does not. Let us consider the values of real and terminal goodwill determined in the previous section under the steady growth hypothesis, equal to: GR = 1,113,219,753 and GT = 6,844,591,416 (Table 4).

Table 4 Current Goodwill and Growth Goodwill

Years	*Abnormal earnings (x – cost of capital)*	*Discounted abnormal earnings*	*Abnormal earnings' growth*	*Current abnormal earnings*	*Discounted current abnormal earnings*	*Discounted abnormal earnings' growth*
1	325,400,000	296,357,013		325,400,000	296,357,013	
2	445,907,200	369,862,077	120,507,200	325,400,000	269,906,205	99,955,873
3	591,718,553	447,000,662	266,318,554	325,400,000	245,816,216	201,184,447
		1,113,219,753	386,825,754		812,079,433	301,140,320

The abnormal earnings estimated for the first year of analytic forecast are equal to 325,400,000. If we assume this earnings condition remains constant during that time, we would get a value of 3,320,408,163 (325,400,000 / 0.098) that we define as current goodwill. This value can be broken down into a real component and a terminal component. The first one, the real component, is obtained from the net present value of the abnormal earnings flow of 325,400,000 projected on the time horizon of analytic forecast (three years) and it is equal to: 812,079,433. The terminal component is calculated through difference and it is equal to: 3,320,408,163–812,079,433 = 2,508,328,730. To the current goodwill has to be added the growth goodwill broken down into its real and terminal components. The real component of the growth goodwill is obtained by the discounting of the overall growth of the abnormal earnings during the analytic projection period in respect of the starting conditions. Through the discounting of this growth we get the real growth goodwill equal to: 301,140,320. (The sum of the real current goodwill 812,079,433 and the real growth goodwill 301,140,320 is equal to 1,113,219,753, that is, the real goodwill.) In order to determine the terminal growth goodwill, we have to consider the overall value of the terminal goodwill, equal to 6,844,591,416. Since we know that the terminal current goodwill is equal to 2,508,328,730, through difference, the terminal growth goodwill will be equal to 6,844,591,416–2,508,328,730 = 4,336,262,686. The breakdown of the goodwill into its real, terminal, current and growth components, under the steady growth hypothesis, is summarized in Table 5.

Table 5 Real, Terminal, Current and Growth Goodwill Under Steady Growth Hypothesis

	Real goodwill	*Terminal goodwill*	*Overall goodwill*	*%*
Current	812,079,433	2,508,328,730	3,320,408,163	41%
growth	301,140,320	4,336,262,686	4,637,403,006	59%
Overall goodwill	1,113,219,753	6,844,591,416	7,957,811,169	100%
%	14%	86%	100%	

In the light of the results in Table 5, it emerges that the current earnings conditions explain the 41 per cent of the overall goodwill value (current goodwill), whereas the remaining 59 per cent represents that part of the goodwill traceable to the growth benefits. In other words, we can state that if the goodwill value depended exclusively on the current earnings conditions, it would be equal to 3,320,408,163 (and not to 7,957,811,169), and its greater value, equal to 4,637,403,006, is traceable to the earnings' growth in respect of the starting conditions. A further consideration is the terminal goodwill value (6,844,591,416), equal to around 86 per cent of the overall goodwill value. The terminal goodwill is explained, for around 37 per cent, by the current earning conditions (that is, the terminal current goodwill equal to 2,508,328,730) and for the remaining 63 per cent by growth conditions (terminal growth goodwill equal to 4,336,262,686). Let us say that the only terminal growth goodwill accounts for 55 per cent of the total goodwill value (4,336,262,686 / 7,957,811,169). The overall goodwill therefore, in addition to being largely explained by the terminal value (equal to 86 per cent of the total goodwill), is traceable for 55 per cent to that part of the terminal goodwill that comes from the benefits of growth and not from the current earnings conditions.

BUSINESS GOODWILL

After breaking down the overall goodwill value into real and terminal goodwill and having analyzed their current and growth components, let us consider a further breakdown, to give us an understanding of the origins of the goodwill and of the abnormal earnings from which it comes. This breakdown process consists of relating the goodwill value to the business areas where the enterprise operates (business goodwill). The process of analysis that leads to business goodwill evaluations requires preliminary definition of the following:

1. business areas where the enterprise operates;
2. cost of equity of each business (keb_r) and of the enterprise as a whole (ke);
3. expected earnings of each business (xb_{rs});
4. invested capital of each business division (Bb_{rs-1}).

Let us say that the breakdown of the overall goodwill in real, terminal, current and growth terms is also applicable, by the same logic, to business goodwill, but for the sake of brevity, this chapter will not deal with them. In order to identify the business areas in which the enterprise operates, we refer to the segment-reporting information reported in the consolidated financial statement of Capitalia (31 December 2006), from which it can be inferred that the Capitalia group comprises five business areas:

- retail which includes mass, affluent and private clients and small businesses;
- mid-corporate and foreign branches;
- wholesale & investment banking which includes large corporate, institutional, advisory, finance and markets;
- financial services which include Fineco Bank, MCC asset management;
- treasury, holdings and Capitalia Service Joint Venture centre.

In the process of goodwill breakdown developed in this section, we do not make any reference to the corporate goodwill. The overall internally generated goodwill is allocated between the five divisions without emphasis on the existence of resources at corporate level. Even though it is reasonable to suppose the existence of corporate resources that contribute in a specific way to the abnormal earnings' creation, their underline is quite complicated. Since the financial statement's segment information and the advisors' reports make explicit reference to the five divisions mentioned above, and since all the costs, revenues and assets are allocated to them, we therefore deem the allocation of the overall goodwill to the five different businesses suitable. In order to estimate the cost of capital it is assumed, in simple terms, that the cost of capital of the five businesses corresponds to the cost of capital of the group as a whole, equal to 9.8 per cent (keb_r = ke). This hypothesis, consistent with what is assumed by the financial analysts, makes it impossible to identify, in the breakdown of the total goodwill value into the different businesses, the risk compensating effect coming from the divergence between the cost of capital of each division and the cost of capital of the enterprise as a whole, used in the abnormal earning capitalization. The expected earnings of each business division,xb_{rs}, are determined through the multiplication of the contribution of each area of activity to the group net income (segment-reporting information) by the expected earnings from which the overall goodwill comes. Let us assume that the overall goodwill is determined through the perpetual rent formula,

$$G = \frac{[x - (ke \times B)]}{ke}$$

then, since:

G = 7,957,811,169
ke = 0.098
B = 9,717,129,000

the perpetual expected earnings *x:*

$$x = ke + B + ke \times G$$

are equal to 1,732,144,137.

Multiplying this value by the contribution of each division to the group net income, we can get a reasonable estimation of the earnings expected by each area of activity. Finally, in order to provide the share of capital of each business division, the percentage incidence of the RWA[7] for each area, as reported in financial analysts' reports, has been used as a parameter.[8] Multiplying this parameter by the equity book value used to determine the total goodwill (equal to 9,717,129,000), we get an estimation of the equity share attributable to each area of activity. The previous information is summed up in Table 6:

Through this information it is possible to determine the abnormal earnings of each division and, subsequently, the business goodwill attributable to each area of activity.

Table 6 Business Goodwill Evaluation (1)

	Retail	*Mid-corporate and foreign branches*	*Wholesale & investment banking*	*Financial*	*Treasury, holding and JV*
% of incidence of each area on the group net income (Source: segment reporting information)	23%	10%	35%	18%	14%
% of incidence of each area on the group equity (Source: JPMorgan, European Equity research, 23 February 2007)	23%	29%	21%	15%	12%
equity cost of each division (keb_r)	0.098	0.098	0.098	0.098	0.098
expected earnings for each division, (xb_{rs}) (% incidence of each area on the net group income 1,732,144,137)	401,294,353	177,243,308	597,767,589	307,827,948	248,051,189
equity share attributable to each area Bb_{rs-1} (% RWA × group equity 31.12.2006)	2,234,939,670	2,817,967,410	2,040,597,090	1,457,569,350	1,166,055,480

Table 7 Business Goodwill Evaluation (2)

	Retail	*Mid-corporate and foreign branches*	*Wholesale & investment banking*	*Financial*	*Treasury, holding and JV*
expected abnormal earning for each division	182,270,264	–98,917,499	397,789,074	164,986,152	133,777,752
business goodwill	1,859,900,652	–1,009,362,231	4,059,072,186	1,683,532,160	1,365,079,102
% incidence of each area on the overall goodwill	23.4%	–12.7%	51.0%	21.2%	17.2%

The sum of the five businesses' goodwill provides the total goodwill value:

$$G = Gb_{retail} + Gb_{mid-corporate} + Gb_{W\&IB} + Gb_{financial} + Gb_{treasury} \approx 7{,}958{,}000{,}000$$

From the results deriving from the breakdown of the overall goodwill into the different areas of activity, it can be inferred that earnings and above-normal earnings assume, within the same enterprise, features and dimensions which are very different. These differences are the demonstration of how abnormal earnings, and consequently goodwill, find their origin in competitive phenomena that can vary significantly according to the different areas in which the enterprise competes. Furthermore, from the analysis of the enterprise's profitability and its comparison with the profitability of the five business areas, it emerges that, on the basis of the assumed hypothesis, the expected profitability of the enterprise is equal to 17.8 per cent (calculated from the ratio between the expected earnings 1,732,144,137 and the group equity book value 9,717,129,000), whereas the profitability of the different divisions is as follows:

retail: $\frac{401{,}294{,}352}{2{,}234{,}939{,}670} = 18\%$

mid-corporate and foreign branches: $\frac{177{,}243{,}308}{2{,}817{,}967{,}410} = 6.3\%$

wholesale & investment banking: $\frac{597{,}767{,}589}{2{,}040{,}597{,}090} = 29.3\%$

financial: $\frac{307{,}827{,}948}{1{,}457{,}569{,}350} = 21.1\%$

treasury, holdings, JV centre: $\frac{248{,}051{,}189}{1{,}166{,}055{,}480} = 21.3\%$.

Considering the difference between the profitability and the cost of capital it possible to underline the spread of each business area:

- retail: 18%–9.8% = 8.2%
- mid-corporate and foreign branches: 6.3%–9.8% = –3.5%
- wholesale & investment banking: 29.3%–9.8% = 19.5%
- financial: 21.1%–9.8% = 11.3%
- treasury, holdings, JV centre: 21.3%–9.8% = 11.5%.

Figures 1 and 2 show a graphical summary of the different businesses' goodwill. Figure 1 shows the spread value of each business, relating it to profitability and business risk. Since in this analysis the same risk for each area of activity has been assumed, the spreads of the different business divisions are traceable to their different profitability. Figure 2 shows the abnormal earnings for each business, relating it to spread and invested capital. It shows particularly how the negative abnormal earnings of the division mid-corporate and foreign branches are explained by the negative spread and by the fact that this area of activity is the one that absorbs the greater portion of equity (2,817,967,410).

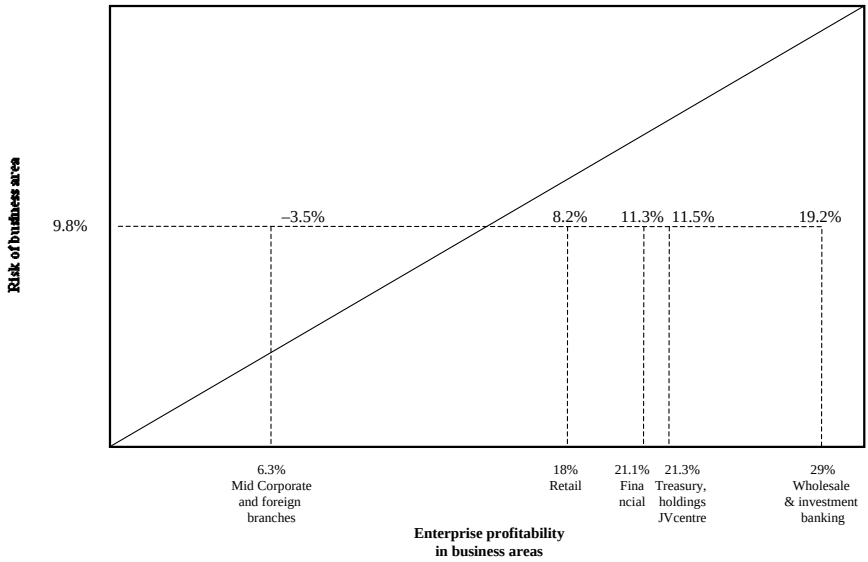

Figure 1 Business areas' spread.

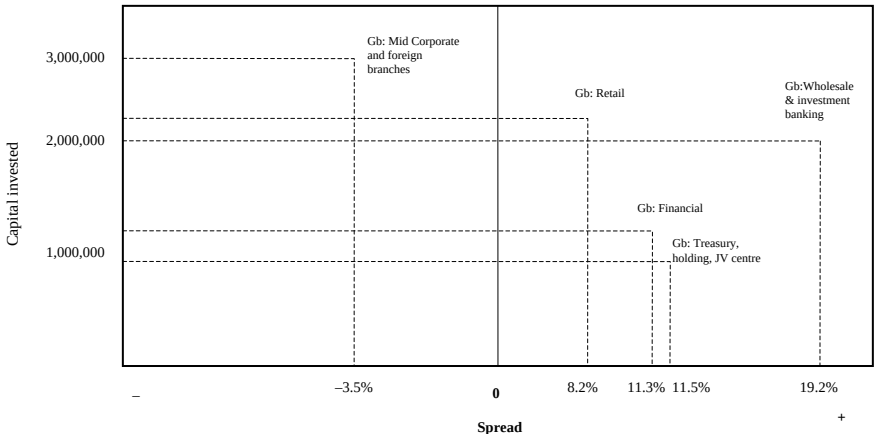

Figure 2 Business areas' abnormal earnings.

POSITIONAL GOODWILL AND SYSTEM GOODWILL

Focusing our attention on the two divisions that most diverge from the average performance of the enterprise (the mid-corporate and foreign branches and wholesale & investment banking) we can develop a further analysis to identify, for both divisions, which part of the goodwill value is connected to the competitively advantageous position of the enterprise (positional goodwill) and which is connected to the favorable profitability of the competitive system (system goodwill). The distinction between profitability and risk of the competitive system allows us to trace the goodwill value to two phenomena: the abnormal earnings of the competitive system (system goodwill in the specific business) and the abnormal earnings of the individual enterprise (positional goodwill in the specific business). The following relation therefore applies:

$$Gb_r = Gp_r + Gs_r$$

in which Gp_r and Gs_r sta nd for, respectively, positional goodwill in business r, and system goodwill in business r. Let us consider, for example, the goodwill of the division of wholesale & investment banking, equal to 4,059,072,186. In order to proceed with the breakdown of this value into positional and system goodwill, it is necessary to assume some hypotheses. First of all, let us suppose that the cost of equity of the wholesale & investment banking division is equal to 9.8 per cent, with a β value (indicator of the particular risk of the enterprise with reference to the specific business) equal to 0.96. Let us also assume that the values of system profitability and risk are respectively:

$RNS_{sr} = 22\%$

$kes_r = 10.4\%$

with a system beta equal to 1.09 higher than the one applied to the enterprise. In this way, we assume that the average risk conditions at the system level are higher than those that the enterprise actually takes on in the specific business area.

Now, applying the formula that leads to the system goodwill determination:

$$Gs_r = \sum_{s-1}^{\infty} \frac{[RNS_{rs} - kes_r] \times Bb_{rs-1}}{[1 + kes_r]^s}$$

and adopting the perpetual rent formula, we obtain the following results:

$$Gs_r = \frac{[(0.22 - 0.104) \times 2{,}040{,}597{,}090]}{0.104} = 2{,}276{,}050{,}600$$

Hence, calculation of the positional goodwill as a difference (4,059,072,186–2,276,050,600) gives results equal to 1,783,021,586. Through this breakdown it is possible to state that the business goodwill of the wholesale & investment banking division is traceable for 56 per cent to an advantageous profitability of the competitive system and for the remaining 44 per cent to an advantageous position of the enterprise within that competitive system. Since the advantageous position of the enterprise (positional goodwill) derives from favorable conditions in terms of profitability and/or risk in comparison with those that characterize the competitive system as a whole, it is possible to break down the value of 1,173,021,586 into an income effect and a risk effect. The enterprise profitability within the business is equal to 29.3 per cent, whereas the system average profitability is equal to 22 per cent. The cost of equity of the enterprise within the business is equal to 9.8 per cent, whereas the system average equity cost is equal to 10.4 per cent. Neutralizing the risk differential coming from the difference between enterprise equity cost and the competitive system equity cost, we see that the profitability effect can be isolated and highlighted (IE):

$$IE = \frac{[(0.293 - 0.22) \times 2{,}040{,}597{,}090}{0.098} = 1{,}520{,}036{,}608$$

If instead we neutralize the profitability differential coming from the divergence between the enterprise profitability within the business and the average competitive system profitability, the risk effect (RE) is highlighted:

$$RE = \frac{[(0.22 - 0.098) \times 2{,}040{,}597{,}090}{0.098} - \frac{[(0.22 - 0.104) \times 2{,}040{,}597{,}090]}{0.104} =$$

264,284,552

Through the isolation of the risk and income effects it can be inferred that the advantageous position of the enterprise within the wholesale & investment banking division (expressed by a positional goodwill equal to 1,783,021,586) is connected in large part (85 per cent) to the higher profitability of the enterprise in comparison with the one that characterizes the system, and only for 15 per cent to the lower risk conditions that the enterprise takes on in comparison with those that characterize the system. Now, let us move on to the analysis of the mid-corporate and foreign branches division, equal to –1,009,362,231. Since in the process of business goodwill calculation we assumed that the cost of equity is equivalent in each business area and equal to 9.8 per cent, we assume that in this case also the cost of equity includes a β value, equal to 0.96. Furthermore, let us suppose that the values of system profitability and risk are respectively:

$RNS_{sr} = 15\%$

$kes_{r} = 10.4\%$

with a system beta equal to 1.09 higher than the one applied to the enterprise. In this way, we assume that the average risk conditions at the system level are higher than those that the enterprise actually takes on in the specific business area. Applying the formulas previously seen we can highlight a system goodwill equal to:

$$Gs_r = \frac{[(0.15 - 0.104) \times 2{,}817{,}967{,}410]}{0.104} = 1{,}246{,}408{,}662$$

and as a difference a positional goodwill equal to: –1,009,362,231 –1,246,408,662 = –2,255,770,893. From this breakdown it can be inferred that, on the basis of the assumed hypothesis, the enterprise benefits from a favorable profitability of the competitive system (expressed by a positive system goodwill) that, nevertheless, is erased by a disadvantageous position of the enterprise within this competitive system (expressed by a negative positional goodwill). The analysis of the reasons for that disadvantageous position suggests the breakdown of the positional goodwill into income effect and risk effect. The profitability on the enterprise in the business is equal to 6.3 per cent, whereas the system's average profitability is equal to 25 per cent. The enterprise's cost of equity in the business is equal to 9.8 per cent, whereas the system's cost of equity is equal to 10.4 per cent. In this case it is possible to isolate an income effect equal to:

$$IE = \frac{[(0.063 - 0.15) \times 2{,}817{,}967{,}410]}{0.098} = -2{,}501{,}664{,}946$$

and a risk effect equal to:

$$RE = \frac{[(0.15 - 0.098) \times 2{,}817{,}967{,}410}{0.098} - \frac{[(0.15 - 0.104) \times 2{,}817{,}967{,}410]}{0.104} =$$

248,839,351

The underlining of the two income and risk components discloses that the negative value of the positional goodwill, expression of a disadvantageous position of the firm within the competitive system, is almost completely due to the profitability differential, that is to say, because the enterprise gains from the mid-corporate and foreign branches business a profitability lower than the one averagely gained from the same business by the competitive system. Still referring to the mid-corporate and foreign branches division, let us introduce a variation in the hypothesis concerning the competitive system's cost of equity. Let us suppose that its value shifts from 10.4 per cent to 9.67 per cent, with an industry beta equal to 0.94. In this way, we assume that the average risk conditions at system level are slightly lower than the ones that the enterprise actually takes on in the specific business area. Under this hypothesis, applying the previous formula we can highlight a system goodwill equal to:

$$Gs_r = \frac{[(0.15 - 0.096) \times 2{,}817{,}967{,}410]}{0.096} = 1{,}585{,}106{,}668$$

This value is, obviously, higher than the one previously determined (equal to 1,246,408,662) because, the profitability being unchanged, we have reduced the average risk of the system represented by the cost of capital. The positional goodwill would be equal to:

–1,009,362,231 –1,585,106,668 = –2,594,468,899.

Focusing now on the profitability and risk components that characterized the positional goodwill, we can isolate a income effect equal to:

$$IE = \frac{[(0.063 - 0.15) \times 2{,}817{,}967{,}410]}{0.098} = -2{,}501{,}664{,}946$$

unchanged in comparison with the one previously determined, because the hypotheses concerning the profitability are unchanged. The risk effect, instead, is equal to:

$$RE = \frac{[(0.15 - 0.098) \times 2{,}817{,}967{,}410}{0.098} - \frac{[(0.15 - 0.0967) \times 2{,}817{,}967{,}410]}{0.0967} =$$

– 89,858,655

On the basis of the new hypothesis, it can be inferred that the negative value of the positional goodwill is attributable to the profitability differential, that is to say, to the fact that the enterprise gains from the mid-corporate and foreign branches activity a profitability lower than the one averagely gained by the competitive system in the same business and, in addition to that, a negative value of the risk differential emerges. Through the business goodwill breakdowns mentioned above, we have tried to underline how different values of the divisions' expected earnings and, consequently, different business goodwill are traceable to:

- structural phenomena, that is to say, phenomena depending on the characteristics of the competitive system (system goodwill);
- specific phenomena related to the advantageous/disadvantageous positions of the specific firm within the competitive system (positional goodwill), which, in their turn, are further divisible into a risk effect and a profitability effect.

IN BRIEF

In this appendix, we have tried to interpret, on the basis of the assumed hypothesis, the value of Capitalia's internally generated goodwill through a breakdown process aimed at disclosing the general conditions at the origin of Capitalia's goodwill value. Before moving on to the interpretation of the more significant aspects arising from this study, it is necessary to remark that the analysis is based on hypothesized values and therefore it has to be considered as an exemplification, as a simulation. A precise analysis of the economic causes of goodwill, in fact, would require a knowledge of highly specific, sensitive and confidential information, which can be accessed only by internal subjects of the company. In the light of this premise, the more outstanding aspects of the breakdown process developed in this appendix are represented in Figures 3, 4a and 4b.

- The breakdown of the internally generated goodwill of Capitalia into real and terminal goodwill allows us to underline that the overall goodwill value is in large part related (86 per cent) to a synthetic value (terminal goodwill) and only 14 per cent relates to an analytic projection of the abnormal earnings flows expected for a specific period of time.
- The distinction between current and growth goodwill emphasizes that the overall goodwill value is traceable for 41 per cent to the current profitability conditions and for the remaining 59 per cent to growth profitability conditions. This breakdown, furthermore, underlines that the terminal growth goodwill accounts for 55 per cent of the total goodwill value. In other words, Capitalia's internally generated

goodwill, in addition to being in large part explained by the terminal value, is for 55 per cent traceable to that part of the terminal goodwill that comes from the benefits of growth and not from the current earnings conditions.

- The breakdown of the goodwill in relation to the strategic business areas in which the enterprise operates allows us to underline the contribution of each business division to the creation of the overall goodwill. From this breakdown it can be inferred that two divisions significantly diverge from the contribution averagely brought by the business areas: the wholesale & investment banking division accounts for 51 per cent of the overall goodwill value but, on the other hand, the mid-corporate and foreign branches division brought a negative contribution to the goodwill creation process. The contribution of these two divisions, has been further developed in order to explain, on the basis of the assumed hypothesis, which part comes from structural phenomena (system goodwill) and which part comes from positional phenomena (positional goodwill).
- Finally, the breakdown of the positional goodwill in profitability effect and risk effect highlights how the advantageous or disadvantageous position of the enterprise (positional goodwill) is related to specific favorable or unfavorable conditions, in comparison with those which characterize the competitive system.

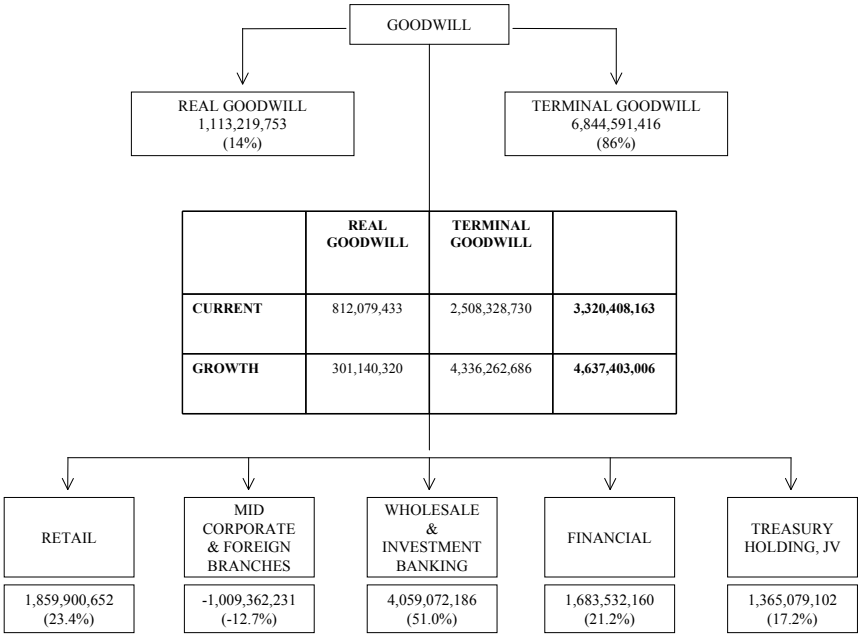

Figure 3 In brief.

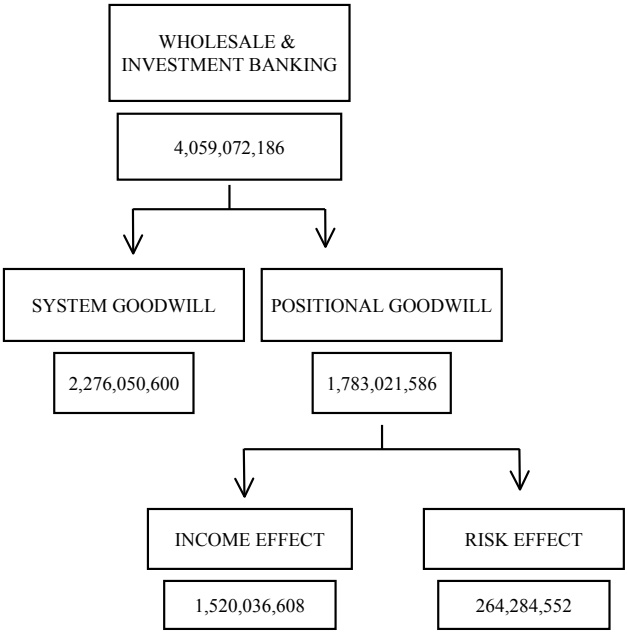

Figure 4a Breakdown of the wholesale and investment banking division's goodwill.

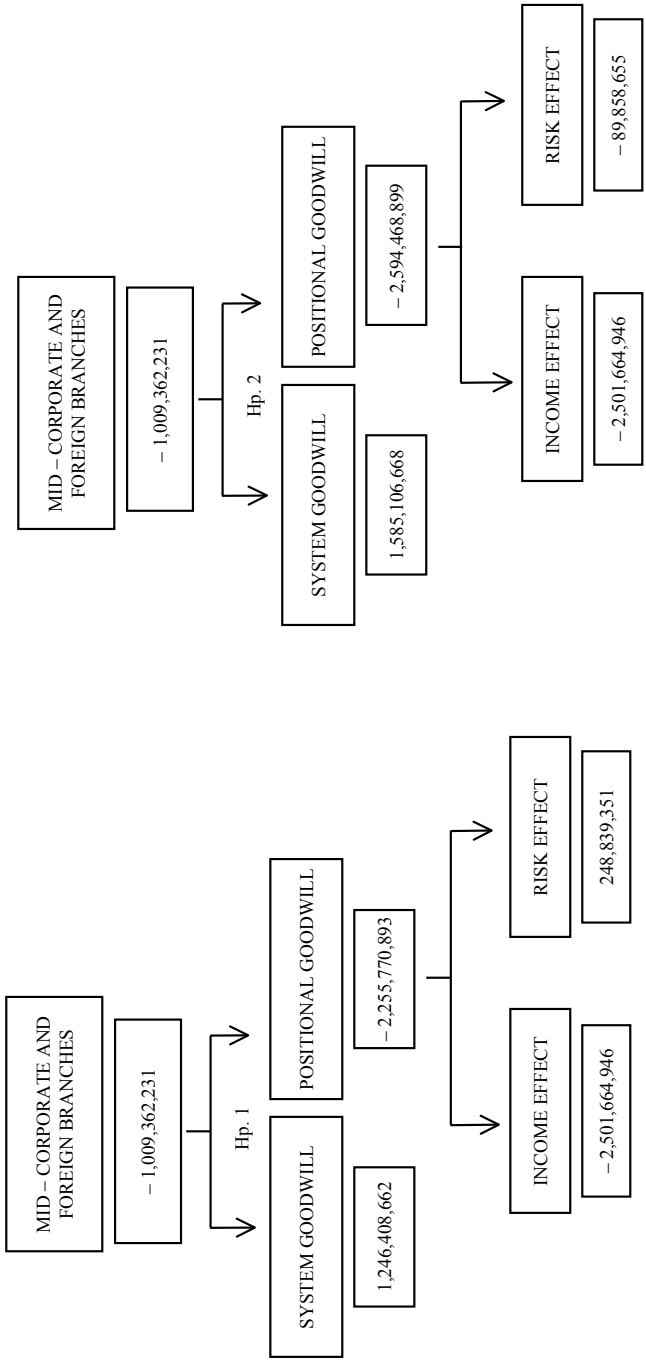

Figure 4b Breakdown of the mid-corporate and foreign branches division's goodwill.

Notes

CHAPTER 1

1. Lev determines I (normalized earnings) as arithmetic mean of the earnings obtained in the previous three years and the earnings expected for the subsequent three years. 'A Key ingredient in this approach is the definition of an enterprise economic performance as an aggregate of past core earning (earnings excluding unusual and extraordinary items), and future, or growth potential. A performance measure which on past earnings or cash flows, or a modification of earnings (e.g., the various value added measures), misses a major part of what intangible assets are all about–creating future growth (e.g., by investment in R&D, Internet activities, or employee training).' (Gu & Lev 2001).
2. The impairment test shall be applied in accounting for impairment of all assets, other than:
    - inventories (IAS 2);
    - assets arising from construction contracts (IAS 11);
    - deferred tax assets (IAS 12);
    - assets arising from employee benefits (IAS 19);
    - financial assets that are within the scope of IFRS 39 Financial Instruments: Recognition and Measurement;
    - investment property that is measured at fair value (IAS 40);
    - biological assets related to agricultural activity that are measured at fair value less estimated point of sale costs (IAS 41);
    - deferred acquisition costs and intangible assets, arising from an insurer's contractual rights under insurance contracts within the scope of IFRS 4 insurance contracts;
    - non-current assets (or disposal groups) classified as held for sale in accordance with IFRS 5 Non Current Assets held for sale and Discontinued Operations.

CHAPTER 2

1. The shift from the Dividend Discount Model to the models based on the free cash flow to equity (FCFE) doesn't represent a radical change: under Damoradan's opinion, it means to shift from a flow based on

actual dividends, to a flow based on potential dividends (Damoradan 1994, 2006).

2. The expression can be written in the following way:

$$VME_0 = B_0 + \sum_{s=1}^{\infty} \frac{x_s}{(1+ke)^s} - \sum_{s=1}^{\infty} B_{s-1}\left[\frac{1}{(1+ke)^{s-1}} - \frac{1}{(1+ke)^s}\right]$$

since

$$\frac{1}{(1+ke)^{s-1}} - \frac{1}{(1+ke)^s} = \frac{ke}{(1+ke)^s}$$

therefore, that which was to be demonstrated is:

$$VME_0 = B_0 + \sum_{s=1}^{\infty} \frac{[x_s - (ke \times B_{s-1})]}{(1+ke)^s}$$

The demonstration is verified also in the case in which the period of time of the flows projection is definite (for example 10 years). It is sufficient to remind that in the last year the B_s value is equal to zero, since the capital is distributed as dividend, that is $d_s = x_s + B_{s-1}$.

3. $ROE = \frac{I}{E} = \frac{IO - kd \times D}{E}$

   IO = ROI (D + E)

   $ROE = \frac{ROI \times (D+E) - kd \times D}{E} = \frac{ROI \times E}{E} + \frac{(ROI - kd) \times D}{E} = ROI + (ROI - kd) \times \frac{D}{E}$

4. So far ROE has been expressed as $\frac{I}{B}$, or as $\frac{x_s}{B_{s-1}}$, where the equity was equal to its book value (B). For the reasons mentioned above, from now on we will consider the market value of both equity (E) and debt (D).
5. In the formula [2.2] we assume that the rate used to discount the tax savings (the denominator rate) is equal to kd. Then, we assume that the risk of these flows corresponds to the risk of the underlying debt, whose cost is kd. This hypothesis is commonly accepted in the corporate finance literature, even if it should require some deepening (Fernandez 2004, Cooper & Nyborg 2006).
6. The formulation [2.19] is correct if we assume the hypothesis that all the risk is supported by the equity investors, and not, at least in part, by the debt investors. In this case, the [2.19] will be:

   $\beta L = \beta U[1 + (1-t)\frac{D}{E}] - \text{debt}\ (1-t)\frac{D}{E}$
7. It is important to bear in mind that the financial risk is not included in the estimation of the unlevered keU value and that therefore the unlevered is being used.
8. The first term of the sum corresponds to the equity value in case of non-deductibility of interest expenses. The second term measures instead the current value of tax benefits.
9. The ratio is also defined ROIC (Return on Invested Capital). To evaluate the shift from ROE and ROI to ratios based on the cash flows (CROCI, Cash Flow Return on Capital Invested, or CFROI, Cash Flow Return on Investment) see Damoradan (2006).
10. Since the enterprise has no debt, it is fair to assume that y (net operating profit) and x (net income) perfectly match. Moreover, it is also

possible to assume, only for the sake of simplicity, that such profit values are equal to the corresponding FCFO and FCFE cash flows. In any case, the section titled "Asset Side and Equity Side Logics for Enterprise Valuations" describes the differences between cash flows and income flows.

11. According to the DCF, flows can be projected into the future with two logics:
    1. in a synthetic way, that is to say, using a synthesis flow in perpetuity;
    2. with analytic methods, based on a punctually determined flow for a specific period of time to which it is necessary to sum a synthetic terminal flow (terminal value).

    The terminal value, which can also be obtained through the method of multiples, assumes, from a theoretical point of view, the meaning of liquidation value of the enterprise or the meaning of enterprise value under equilibrium conditions.
12. It is necessary to remind about the role played by the inflation. The basic rule is very simple: real flows have to be discounted with real rates, whereas nominal flows have to be discounted with nominal rates. Let us remark that:

    $k_{nominal} = (1+\rho) \times (1+k_{real}) - 1$

    with ρ equal to the inflation rate. So if, for example, the investment rate is equal to 20 per cent, the profitability of new investments is equal to 12 per cent and the inflation rate is equal to 1.5 per cent, it will be:

    $g_{real} = 0.2 \times 0.12 = 2.4\%$
    $g_{nominal} = (1 + 0.015) \times (1 + 0.024) - 1 = 3.9\%$
13. The formula [2.38] assumes the steady growth hypothesis. In the case of temporary growth the operating flows terminal value is:

$$V_{unlevered} = \frac{FCFO_T \times \left[1 - \frac{(1+g)^T}{(1+keU)^T}\right]}{keU - g} + \frac{FCFO_{T+1}}{keU \times [(1+keU]^T}$$

    Under the multi-stage model, changing growth rates are applied to different time periods. In the case of two-stage growth (the simplest multi-stage growth):

$$\text{TVunlevered} = \frac{FCFO_T \times \left[1 - \frac{(1+g_1)^T}{(1+keU)^T}\right]}{keU - g_1} + \frac{FCFO_{T+1}}{(keU - g_2) \times (1+keU)^T}$$

    The multi-stage growth can be represented with different models. For example, the H model is a two-stage model for growth in which the g in first phase is non-constant but declines linearly over time, to reach the stable growth rate in steady state (Fuller & Hsia 1984).
14. In the case of temporary growth:

$$TV_{TS} = \frac{D_0 \times kd \times t \times \left[1 - \frac{(1+g)^T}{(1+kd)^T}\right]}{kd - g} + \frac{D_T \times kd \times t \times (1+g)^T}{kd \times (1+kd)^T}$$

In the case of two-stages growth:

$$TV_{TS} = \frac{D_0 \times kd \times t \times \left[1 - \frac{(1+g_1)^T}{(1+kd)^T}\right]}{kd - g_1} + \frac{D_T \times kd \times t \times (1+g_1)^T}{(kd - g_2) \times (1+kd)^T}$$

15. Let us remark on the different evaluation options of the DCF:
    1. equity side or asset side;
    2. aggregated method and disaggregated method;
    3. synthetic method and analytic method with terminal value;
    4. methods with steady growth, temporary growth and multi-stages growth.
16. In relation to the way in which the enterprise is evaluated, it could be necessary to deduct also the minorities value.
17. $[(1-keU]^S$.
18. The equality between the two methods is verified also if in both the cases it is used, as flow for the calculation of terminal value, the x value (net profit) and not the d value (dividend).
19. The value of the invested capital (EV [enterprise value]) is broken down into two components:
    - COV, Current Operation Value, equal to the sum of the invested capital and the capitalized value of the last available EVA with the perpetual rent formula, which is $\frac{EVA}{WACC}$;
    - FGV, Future Growth Value, that is theoretically traceable to the actual value of the future EVA growth perspectives, which is $\sum_{s=1}^{\infty} \frac{\Delta EVA_t}{(1+WACC)^t}$.

CHAPTER 3

1. In fact, posing

$$y = yb_1 + yb_2$$
$$C = Cb_1 + Cb_2$$
$$keU = keb_1U\frac{Cb_1}{C} + keb_2U\frac{Cb_2}{C} = \frac{keb_1UCb_1 + keb_2UCb_2}{C}$$

The expression $\frac{y - keU \times C}{keU}$ may also be written as follows:

$$\frac{yb_1 + yb_2 - [keb_1UCb_1 + keb_2UCb_2]}{keU} = \frac{yb_1 - keb_1UCb_1 + yb_2 - keb_2UCb_2}{keU} =$$

hence:

$$\frac{y - keU \times C}{keU} = \frac{yb_1 - keb_1UCb_1}{keU} + \frac{yb_2 - keb_2UCb_2}{keU}$$

2. Should the perpetual rent not be used, the COM value will be naturally equal to

$$\sum_{s=1}^{n} [(1+keU)^{-s} - (1+keb_rU)^{-s}]$$

CHAPTER 4

1. Following the APV method, used in this contribution, the goodwill calculation will be developed as though an enterprise were exclusively financed by equity capital (see previous chapters).
2. Rent may also be defined as additional earning which does not require additional capital or work investments.
3. In this chart, and more generally, in the analysis that we are developing, it is hypothesized that the only difference existing between enterprise risk and sector-specific risk is expressed by a different beta. On a practical level, this is not always the case. In case of specific risks relative to a given enterprise, and based on the way in which its beta is determined, it is possible to correct the rate calculated in the CAPM environment with an Additional Risk Premium (ARP):

   $$ke = Rf + \beta(Rm - Rf) + ARP$$

   This problem would not arise if an effort were made to correct the rate directly acting on the enterprise beta value (the so-called total beta).
4. In fact: 0.07 = 0.045 + 1.25(0.065–0.045).
5. In fact, it should not be forgotten that the expression

   $$EP = (ROI - ke)C$$

   is equal to:

   $$\frac{EP}{C} = (ROI - ke)$$

   $$EP = RO - keC$$

CHAPTER 5

1. As regards the SFAS, it is useful to remark that these conditions are required by the SFAS 141, which deals with business combination, and not by SFAS 142, which deals with the accounting treatment of intangible assets acquired individually or with a group of other assets and, consequently, not in a business combination. For these intangible assets, the generic requirement used for the other assets seems to be sufficient.
2. Let us go back to the issue concerning the availability/control of the asset that can be developed in different ways. For example a Brookings Institution study divides the intangible assets into three levels (Blair & Wallman 2001):
   1. level 1: intangible assets that can be owned and sold;
   2. level 2: intangible assets that can be controlled but not separated and sold;
   3. level 3: intangible assets that may not be wholly controlled by the firm.
3. In fact, the Discussion Paper IVSC, Determination of Fair Value of Intangble Assets for IFRS Reporting Purposes, July 2007, has recently focused on these methods.
4. For example, as regards the research and development projects within the pharmaceutical industry, the industrial production price index, the labour cost index, the wholesale price index and the GNP deflator are usually used.

5. Other benchmark factors could be likelihood of infringement, history, scope, etc. (Cohen 2005). Also the cross price elasticity of demand (CP) could be useful in the comparison approach development.

$$CP = \frac{\Delta Q1}{\Delta Qs}$$

Where:

ΔQ1: percentage unit change in the quantity of good 1 (linked to brand 1);

ΔQs: percentage unit change in the quantity of good s (linked to subject brand).

6. The determination of a market ranking is a suggestion that comes from some commentary letters sent to the IASV, in relation to the Discussion Paper.
7. The example is drawn from the IVSC Discussion Paper (IVSC 2007).
8. The approach represented in Table 5.10 follows a building-up logic.
9. In the USA, the Internal Revenue Service originally developed the excess earning method in the Great Depression. In 1968 it reaffirmed the method (Revenue Ruling 68-609).
10. GN 4, Valuation of Intangible Assets.

APPENDIX

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1. The used methodologies and the results yielded are taken from public documents, such as the merger project and the reports of the directors and experts. The evaluating subjects to whom reference is made are the directors of Unicredit assisted by Merril Lynch International (in Table 1, Unicredit) and the directors and consultants of Capitalia: Citigroup, Credit Suisse and Rothschild (in Table 1, Capitalia 1, Capitalia 2, Capitalia 3).
2. All the values are expressed in euros.
3. Given the peculiarity of the activity carried out by the banks, the identification of the financial debt and the interest expense to pay it off takes on a whole new significance. For this reason, in the present analysis, the fiscal benefits deriving from the deductibility of interest expenses paying off the debt (tax shield) are not considered.
4. JPMorgan, European Equity Research, 23 February 2007.
5. Since income is a net income (post-tax income), to guarantee the necessary consistency between flows and rates, the cost of capital, ke, used to discount the income is also a post-tax rate.
6. This value is obtained as the arithmetic mean of the constant growth factors indicated in the reports of directors and consultants.
7. Risk-weighted assets, equal to the value of invested assets weighted for the specific risk level of each asset.
8. JPMorgan, European Equity Research, 23 February 2007.

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