

Financial Valuation: Do We Still Need WACC?

by Bruno HUSSON ⁽¹⁾

With the new IAS-IFRS accounting standards, financial valuation and the DCF (Discounted Cash Flows) method more particularly, have taken on key importance in the process of preparing consolidated accounts. This prospect is somewhat preoccupying given the lack of consensus on how to determine the discount rate, a key parameter in the DCF method and one that is familiar to financiers under its English acronym WACC.

Business valuation practice has evolved greatly over the last ten years. Evidence of this can be found in the variety of methods used in stock market squeeze-outs. Less than ten years ago, evaluations were still being based in many cases on discounted dividend models (Gordon-Shapiro, Bates tables). Today, these traditional methods have largely given way to a more sophisticated approach based on discounting free cash flows and widely referred to in finance as the DCF method, for Discounted Cash Flows.

This method, which has now become inescapable, requires a discount rate to be determined, among other things. This rate is the key parameter in the method, and is defined in corporate finance manuals as the weighted average cost of capital, or WACC. Having said this, the question raised in the title of this article may now seem incongruous, to say the least, but in reality it is not as outlandish as all that. Admittedly, everybody is in agreement on the overall definition of the concept: WACC is the average between the cost of equity and the cost of debt after tax, weighted by market values. However, this consensus does not extend to the terms on which it is calculated, and WACC in fact covers a wide variety of different practices. Evidence of this is the wide range of WACC values observed in delisting operations in the last three years (from 6% to 16% approximately), which is at least as much a sign of disagreements between appraisers on methodology as of differences between the risk and financial structure of the companies being valued.

On top of this, with the upcoming entry into force of the IAS-IFRS standards requiring periodic evaluation of goodwill, European listed companies, and therefore their statutory auditors, are also going to have to become regular WACC users. After recent accounting scandals, and at a time when everything is being done to restore investor confidence, the current disarray regarding WACC methodology cannot possibly be allowed to become a source of uncertainty and volatility in book values.

WACC is no panacea

There is broad agreement among appraisers on the determinants of value: the profitability and growth of the business (influencing future cash flows), interest (expressing the time value of money), the degree of systematic risk of the activity (excluding that fraction of total risk that is eliminated by diversification of individual portfolios) and financial structure (determining tax savings arising from deducting financial costs from the taxable profit of the companies). All these parameters must be explicitly included in the valuation process.

This obligation is simplified to an extraordinary extent by WACC, thereby explaining the great popularity of the tool among appraisers. WACC makes it possible to integrate all the determinants of value simultaneously, except for those relating to future cash flows, which is to say three of the five parameters identified above: (i) time value of money in the form of a risk-free rate, (ii) the cost of systematic risk in

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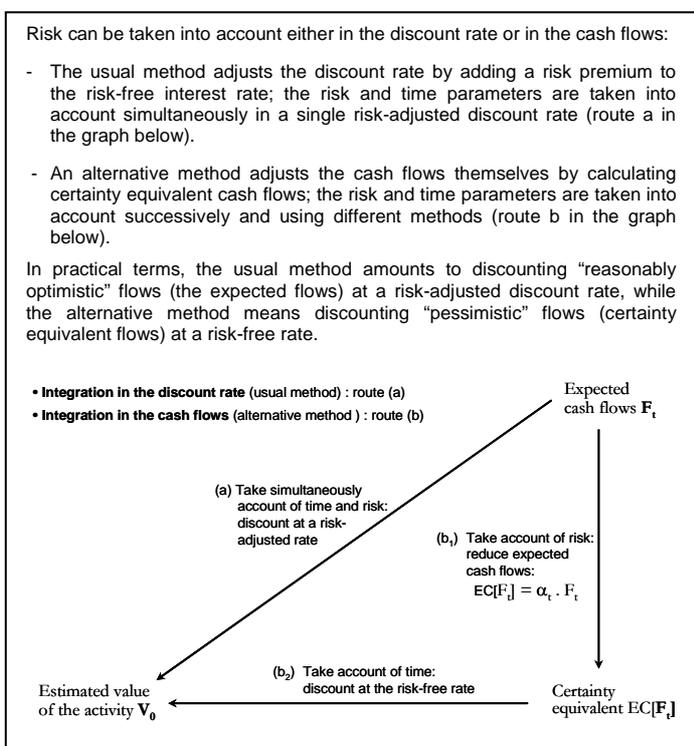
the form of a risk premium, (iii) the impact of debt through a weighting of the costs of the financing used. There is nothing miraculous, however, about this incomparable efficiency of WACC, for it goes hand in hand with restrictive hypotheses, notably regarding risk and financial structure, which rarely fit the complexity of the real world.

These two parameters of risk and financial structure can then be taken into consideration in valuing a business either by adjusting the discount rate, as is the case in the usual WACC method, or by an adjustment of the cash flows themselves, as in the two methods referred to below: the certainty equivalent method (to factor in risk) and the adjusted present value method (to take financial structure into account).

➤ *Taking risk into account*

Due quite simply to the discounting mechanism itself, using WACC implicitly supposes that risk increases with time, because the compensation for risk that is mechanically included in the valuation (using a rate including a risk premium) increases over time. As an illustration, we will consider the valuation of a project that is supposed to generate cash flows over a very long period of time (a freeway concession, for example). Using a rate of 7.3%, comprising a risk-free rate of 4.3% and therefore a low risk premium of 3%, leads us implicitly to apply a discount of 24.0% to cash flow in year ten on the grounds of risk alone. This discount factor will have doubled 14 years later to reach 48.9% and will even have tripled to 72.9% if we wait 21 years.

In practice, such discounts are rarely justified by the characteristics of the projects and activities being valued, especially as the risk taken into account in this discount rate is the systematic (or non-diversifiable) risk of the project, the specific (or diversifiable) risk already having been taken into account in the expected cash flows by the construction of several probability scenarios (generally high, medium and low hypotheses). Hence the interest of this approach consisting in taking systematic risk into account in the cash flows to what are referred to as "certainty equivalent cash flows" in financial theory (see box).



On a purely theoretical level, this alternative method seems somewhat sounder than the WACC method in that it avoids any confusion by dealing separately with issues relating to taking time into account on the one hand, and to taking risk into account on the other. On the practical level, this method that makes no hypothesis on the evolution of risk over time forces the appraiser to take a look at the risk profile of the entity they are valuing. However, the answer to this question is a subjective one and rarely leads to determining precise discounting coefficients. As a result of this, valuing a business using this alternative method usually amounts to discounting cash flows on the basis of a low hypothesis (close to certainty equivalents) at a rate that is logically equal or close to the risk-free rate.

➤ *The impact of financial structure*

Using WACC leads us first of all to acknowledge that debt has a positive impact on the value of the financed assets. Since the two founding articles by Modigliani and Miller (1958 and 1963), the subject has been widely debated in academic circles. Today, however, if a certain consensus emerges, it is on the neutrality of financial structure on asset value, on the basis of two factors that are not taken into account in traditional WACC analysis: (i) the personal taxation of the shareholder which, in contrast with

corporate taxation, is more favorable to income from stock than to income from debt, (ii) bankruptcy costs and, more generally, debt management costs which, as financial leverage increases, balance out any tax savings that might be made, sooner or later.

Also, notwithstanding this academic controversy, use of WACC involves two hypotheses that are somewhat difficult in practice. First, it considers financial structure as being constant in value over the lifespan of the entity being valued, which would appear to be all the more unlikely when the starting financial structure is in debt (as is the case of LBOs in the start-up phase, for example). Next, only tax savings generated by interest expense are taken into account, ignoring other (positive or negative) impacts of the financing that is in place, such as interest rate rebates or the cost of turning to financial markets or bank lending.

To make up for these two shortcomings of WACC, the adjusted present value method simply refuses to take the impact of financing into account in the discount rate, and proposes a two-stage valuation process: (i) estimating the economic value of the activity in its strictest sense, by discounting the cash flows that are generated at the rate of return demanded by the shareholders in the absence of debt (referred to hereafter as the “opportunity cost of capital”), (ii) determining the impact of financing means by assessing the value of the various elements mentioned above separately (tax savings, issue costs...).

As we can see, when it comes to risk and financing issues alike, there are other alternatives to WACC. And yet WACC remains the reference rate of valuation professionals because it is all the more convenient an instrument in that it is easy to manipulate, due to the many pitfalls involved in estimating it and giving rise to the methodological disarray mentioned earlier.

WACC is based on a number of often debatable choices

The usual way of determining WACC involves two stages, beginning by integrating the price of time and the cost of risk to determine the opportunity cost of capital, and then the impact of financing to get the WACC.

The first stage is traditionally based on the CAPM or Capital Asset Pricing Model, despite criticisms of this single-period valuation model (for example, the legitimacy of its use in a multi-period framework for asset valuation). According to the CAPM, the risk premium to be added to the risk-free rate to obtain the opportunity cost of capital of an activity is equal to the average risk premium expected on the stock market (“market risk” below) multiplied by the beta coefficient (“beta”) of the activity in question, the latter measuring the non-diversifiable risk of the activity (i.e. its contribution to overall market risk). Due to the many difficulties involved in estimating these market risk and beta coefficient parameters, this first stage is the most awkward one in the long process to determine the WACC (see box).

➤ *Market premium*

Defined as the difference between the expected rate of return of the stock market and the risk-free rate, the market premium cannot be observed directly. In practice, it is the subject of concurrent estimations by two distinct approaches, one historical and the other forward-looking. The historical approach consists in measuring the difference in the annual return rate observed in the past on a share portfolio and on a portfolio of government bonds. As in any approach aimed at estimating a future variable on the basis of past data, reliability of the estimations based on mean market premiums that have been observed depends primarily on the stability of this premium over time. On this point, a recent empirical study covering the whole of the last century showed not only high annual

Determining WACC to appraise an activity is a long and complex process.

1. Determine the interest (or risk-free interest rate).
2. Estimate the beta for the activity using the following usual analogical method:
 - compile a sample of “comparable” listed companies whose activities are similar to the activity being valued;
 - estimate the equity beta (or “levered” beta) of these comparable companies on the basis of their stock prices;
 - estimate the beta of the activity being valued (assets beta or “unlevered” beta) by “delevering” the equity betas, which implies formulating a hypothesis on the impact of debt on assets value;
3. Estimate the average risk premium anticipated on the stock market.
4. Calculate the opportunity cost of capital.
5. Choose a target financing structure expressed in market value.
6. Calculate WACC:
 - direct calculation by adjusting the opportunity cost of capital downwards in accordance with the hypothesis formulated in Stage 4;
 - indirect calculation using the traditional weighted average cost of capital formula, which means first estimating the cost of equity by “relevering” the asset beta estimated in Stage 2.

market premium volatility, but also an ongoing downward trend over the second half of the century⁽²⁾, two phenomena that would tend to render any mean values that are obtained of little significance.

These shortcomings of the historical method would appear, in principle, to argue in favor of the forward-looking approach. This consists in determining the expected rate of return on a sample of listed companies on the basis of present stock market prices and expected future cash flows. The relevance of this estimation depends mainly on the following two conditions: (i) consistency between the information reflected in stock market prices and that actually used in the forecasts, (ii) quality of short-term forecasts and the how realistic the medium to long-term extrapolations are. These two factors are difficult to ascertain in practice and give rise to variability and to differences between the market premiums calculated monthly by equity research department of investment banks. One academic study has proven to be an exception to this, however, with a premium level of around 3% that is remarkably stable over time,⁽³⁾ using an appraisal model based on the notion of excess profit which has the advantage of avoiding the high sensitivity of traditional discounted dividend models to the infinite growth rate.

The fact remains, however, that the direct forward-looking approach using short-term forecast data and extrapolating over the medium to long term is particularly cumbersome. Also, the information provided by consultants using this approach does not generally allow an appraisal of the pertinence of their estimations by checking compliance with the two conditions presented above. But above all, the market premium estimation given by this approach depends very largely on the relative level of market prices and, more generally, on prevailing market psychology on the date of the estimation. In other words, we cannot rule out the possibility of market premiums showing wide variations over a short period of time. For example, there can be no doubt that the significant fall in stock markets in the wake of 9/11 or in the weeks prior to the outbreak of hostilities in Iraq in spring 2003 expressed a marked increase in the rate of return demanded by investors. Conversely, once these perils were placed in greater perspective, the rise in indices can be seen as showing a reduction in the demands of investors. Such variations in the market premium over periods of time of no more than a few weeks or months must not be confused with long-term trends.

In the specific context of corporate valuation, it would seem best to give preference to a long-term market premium estimation, rather than using the spot estimations of the forward-looking approach. Such an estimation can be obtained by adjusting historical market premiums. Recent studies opting for this third approach have converged in their estimations on a market premium of around 4%,⁽⁴⁾ which is to say a distinctly lower level than that given by the historical approach, and similar to that used today by most sell-side analysts in investment banking.

➤ *Beta coefficient*

The beta of the entity that is being valued is traditionally estimated by an analogical approach⁽⁵⁾ comprising the following three stages: (i) identify listed companies in comparable activities to that being valued, (ii) estimate the beta of the shares issued by those companies, (iii) estimate the beta of the underlying business activities by “unlevering” the abovementioned beta coefficient. Each of these stages involves real difficulties which are sometimes perceived as sources of flexibility making it possible to get the beta and then WACC required to value the entity at a level that has in fact been determined beforehand.

The first stage, the creation of a sample of comparable companies, requires selection criteria to be defined. Belonging to the same sector of activity is the first criterion selected in practice, as it is the one, in principle, that best takes account of the greater or lesser reliance of the entity’s business volume on the overall economic situation. A first pitfall emerges immediately, however: as listed companies are generally firms that have reached a certain level of maturity, they have rarely remained “pure players” involved in just one sector of activity. On top of this, even if we suppose that truly comparable entities can be found, growth strategies within a given sector of activity may vary significantly from one company to another. As an illustration of this, one company might have opted for an all-out in-house approach, while another

(2) “Triumph of the optimists” by Elroy Dimson, Paul Marsh and Mike Staunton, Princeton 2002

(3) “Equity Premia as low as three percent” by Claus and Thomas, *Journal of Finance*, October 2001

(4) See, for example, “The Equity Premium” by Eugene F. Fama and Kenneth R. French, *Journal of Finance*, April 2002, and “What Risk Premium is ‘Normal?’” by Robert D. Arnott and Peter L. Bernstein, *Financial Analysts Journal*, March/April 2002.

(5) An alternative approach which is more rarely used consists in estimating the beta of the entity that is being valued on the basis of predefined qualitative criteria (sensitivity to the general economic situation and the degree of operational leverage, for example).

might prefer to outsource the greater part of its product manufacturing activities. In the former case, the existence of high operational leverage will amplify any fluctuations in the economic situation (high beta), while in the latter, cost-structure flexibility is more than likely to attenuate them (more moderate beta).

The second stage, involving estimating the beta of the shares of these comparable companies, is based on a linear regression using historical series of stock prices and market indices, and also raises a number of questions: the duration of the reference period (one, two, three years or more), the frequency of the historical stock price data (daily, weekly, monthly) and the choice of the reference market index (regional, international). However, we cannot but note that the estimations obtained and their degree of pertinence (measured statistically by the R^2 coefficient of the regression) vary widely depending on the choices that are made. Corporate finance manuals tend to recommend using monthly data over a period of three to four years, but this recommendation is itself in contradiction with another observation made in those same manuals regarding the instability of beta coefficients over time, a phenomenon that is all the more troubling in that it does not seem to result only from changes in the characteristics of the company (changes in its business perimeter or in its financial structure ...).

The third and last stage, in which the betas obtained from stock prices are unlevered, is required to estimate the economic beta of the underlying activities, because the beta of a share is necessarily impacted by its financial leverage. But to what extent? This question refers us back to the controversy mentioned above on the impact of leverage on the value of assets, and the diverse responses to that question can be seen in the many different formulae available for delevering. All in all, the confusion that reigns in practice ultimately results in allowing a range of betas (and therefore of WACC) that is all the broader because the calculation can be based on a wide variety of formulae (the foundations of which are not always known to users) and of financial structures selected with care from among the comparable companies.

When the accountants warn the financiers

So, ultimately, what is left of WACC after this somewhat critical analysis of its methodological foundations and calculation methods? Like for the discounted dividend models that have now been replaced by the DCF method, we should not be afraid to assert that the concept and its didactic power still remain, despite the fact that the valuation tool has had its day.

Thanks to WACC, corporate finance students understand that financing policy is a zero-sum game that does not create value: the return rate required on assets corresponds simply and logically to the weighted average of the return rates demanded by the different categories of financial backers (shareholders, holders of convertible bonds, junior and senior bankers...) in the light of the contractual risks incurred. However, because of WACC, valuation professionals can commit errors of appraisal that will be all the greater when the risk and/or financial leverage of the entity being valued is/are higher (and changing over time), which is far from being a minor paradox for a valuation tool designed precisely to take those two parameters into consideration in the simplest way possible.

The fact remains, however, that the DCF method does require a discount rate, and this question is all the more important today, given the central role this method is called upon to play in the preparation of consolidated accounts in accordance with the IAS-IFRS standards. Unexpectedly, and without it being clear whether this intention was premeditated or not, the accounts standards organizations also raise questions as to the legitimacy of WACC. Regarding risk, standard IAS 36 on the impairment of assets emphasizes the need for consistency between cash flows and the discount rate; it also warns against counting risk twice when it states that “*the discount rate used to measure an asset’s value in use shall not reflect risks for which the future cash flows estimates have been adjusted*” (Paragraph 56). Regarding financial structure, the same standard challenges WACC even more explicitly when it states that “*the discount rate is independent of the entity’s capital structure (...), because the future cash flows expected to arise from an asset do not depend on the way in which the entity financed the purchase of the asset*” (Paragraph A19).

Not only has WACC had its day as a valuation tool, but it would be wrong to set about looking for a universal substitute for it: financial valuation is more of an art than a science, and it is necessary to define the right approach and methods each time for each particular case being analyzed.