

Chapter 2

Competing Financial Performance Measures

Abstract The choice of financial performance measures is one of the most critical challenges facing organizations. Performance measurement systems play a key role in developing strategic plans, evaluating the achievement of organizational objectives, and rewarding managers. The measurement of financial performance in terms of accounting-based ratios has been viewed as inadequate, as firms began focusing on shareholder value as the primary long-term objective of the organization. Hence, value-based metrics were devised that explicitly incorporate the cost of capital into performance calculations. In this chapter, the following value-based measures are discussed, by focusing on their measurement logic: the economic value added (EVA), the cash flow return on investment (CFROI), the shareholder value added (SVA), the economic margin (EM) and the cash flow value added (CVA). The recently emerging emphasis on market value-based measures as the best metrics for value creation is also briefly analyzed.

Keywords Financial performance measures • Discount cash flow (DCF) model • Economic value added (EVA) • Cash flow return on investment (CFROI) • Shareholder value added (SVA) • Economic margin (EM) • Cash value added (CVA) • Residual income (RI) • Market value metrics

2.1 Trends in Performance Measurement

The choice of performance measures is one of the most critical challenges facing organizations. In fact, performance measurement systems play a key role in developing strategic plans, evaluating the achievement of firm's objectives and rewarding managers.

During the 1990s, many managers recognized that traditional accounting-based measurement systems no longer adequately fulfilled these functions.

A 1996 survey by the Institute of Management Accounting (IMA) found that only 15% of the respondents' measurement systems supported top management's business objectives well, while 43% were less than adequate or poor. Sixty per cent of the IMA respondents reported they were undertaking a major overhaul or planning to replace their performance measurement systems, in response to their flaws.

The perceived inadequacies in traditional accounting-based performance measures have motivated a variety of performance measurement innovations, ranging from "improved" financial metrics such as "economic value" measures to "balanced scorecards" of integrated financial and nonfinancial measures (Ittner and Larcker 1998). Despite most economic theories analyzing the choice of performance measures indicate that performance measurement and reward systems should incorporate any financial or nonfinancial measure that provides incremental information on managerial effort, firms traditionally have relied almost exclusively on financial measures such as profits, accounting and stock returns for measuring performance (Ittner and Larcker 1998). Schiemann and Associates conducted a U.S. survey of a cross section of 203 executives on the quality, uses and perceived importance of various financial and nonfinancial performance measures (Lingle and Schiemann 1996). Their results are summarized in Table 2.1. While 82% of the respondents valued financial information highly, more than 90% defined financial measures in each performance area, included these measures in regular management reviews, and linked compensation to financial performance. Conversely, 85% valued customer satisfaction information highly, but only 76% included satisfaction measures in management reviews, just 48% clearly defined customer satisfaction for each performance area or used these measures for driving organizational change, and only 37% linked compensation to customer satisfaction. Similar disparities exist for the other nonfinancial measures.

Most executives were weakly confident of any of these measures, with only 61% willing to bet their jobs on the quality of their financial performance information and only 41% on the quality of operating efficiency indicators, the highest rated nonfinancial measure (Ittner and Larcker 1998). In other words, there a wide gap exists between what is valued and what is considered accurate (Lingle and Schiemann 1996).

Nevertheless, it is interesting to note that this study supports the conclusion that good measurement is essential to good management (Lingle and Schiemann 1996).

In fact, partitioning the sample into two sub-samples¹—measurement-managed and non-measurement-managed organizations—evidence emerges that the

¹ According to their reliance on measurement resulting from the survey: 58% of the organizations were identified as measurement-managed, as senior managers agree with measurable criteria for determining strategic success and management updated and reviewed semi-annual performance measures in at least three of the six types of performance areas.

Table 2.1 Uses, quality and perceived importance of financial and non-financial performance measures

Type of performance measure	Financial performance	Customer satisfaction	Operating efficiency	Employee performance	Community/ environment	Innovation/ change
Information is highly valued ¹	82%	85%	79%	67%	53%	52%
Willing to bet job on the quality of the information ¹	61	29	41	16	25	16
Measures are clearly defined in each performance area ¹	92	48	68	17	25	13
Report measures are updated and reviewed at least semiannually	88	48	69	27	23	23
Measures are included in regular management reviews ²	98	76	82	57	44	33
Measures are used to drive organizational change ²	80	48	62	29	9	23
Measures are linked to compensation ²	94	37	54	20	6	12

¹ per cent of executives responding to the survey who agreed with this statement

² per cent of respondents using these measures who agreed with this statement

source: Ingle and Schieman (1996)

measurement-managed organizations performed better than the non-measurement-managed counterparts on each of the following three performance measures:

- perceived industry-leadership over the past 3 years (74% vs. 44%);
- financial ranking in the industry top third (83% vs. 52%);
- success of the last major cultural and/or operational changes (97% vs. 55%).

Perceived inadequacies in traditional performance measurement systems as well as the managers' confidence in financial performance have led many organizations to place greater emphasis on "improved" financial measures that are claimed to overcome some of the limitations of traditional financial measures. We will review these "new metrics" in the following section.

However, more than 10 years later, this scenario seems to have changed only a little, paradoxically. Focusing on financial performance measures, international evidence indicates that managers remain anchored to traditional financial metrics. A recent survey of 400 U.S. financial executives² (Graham et al. 2005, 2006) shows that the vast majority view earnings—neither cash flows nor any of the "new metrics"—as the most important performance measure they report to outsiders. Nearly two-thirds of the respondents ranked earnings as the most important metric; fewer than 22% choose cash flows and less than 3% other metrics like the EVA. This obsession about earnings (i.e., EPS) was explained as follows (Graham et al. 2005):

- the world is complex and the number of available financial metrics is enormous. Investors need a simple metric that summarizes corporate performance, that is easy to understand and is relatively comparable across companies. EPS satisfies these criteria
- the EPS metric gets the broadest distribution and coverage by the media
- analysts assimilate all the available information and summarize it in one number, that is EPS
- analysts evaluate a firm's progress based on whether a company hits consensus EPS and investment banks assess analysts' performance by evaluating how closely they predict the firms' reported EPS.

The surveyed CFOs showed also a short term focus. Earnings benchmarks are quarterly earnings for the same quarter last year (85% of the surveyed CFOs agree or strongly agree that this metric is important) and the analyst consensus estimate for the current quarter (73.5%). The results strongly suggest that the dominant reasons for meeting or beating short-term earnings benchmarks relate to stock

² The empirical findings emerging from this survey are even more impressive because of the high representativeness of the sample: the companies range from small (15.1% of the sample firms have sales less than \$ 100 million and 19% less than 500 employees) to very large (25% have sales of at least \$ 5 billion and 35% more than 10,000 employees), they operate in many industries (manufacturing weighs 31%, but other sectors like retail, tech, transportation, banking, public utilities are represented) and cover a wide spectrum of ownership structures and CEO characteristics (age, tenure, education, insider ownership).

prices: more than 80% of the interviewed CFOs agreed that meeting benchmarks builds credibility with the capital market, helps maintaining or increasing the company's stock price, and conveys future growth prospects to investors. In other words, they believe that the price setters of their stocks (institutions and analysts, who are sophisticated investors) would not look beyond a short term earnings miss or irregularity in the earnings path.

Finally, they describe a trade-off between the short-term need to deliver earnings and the long-term objective of making value-maximizing investment decisions. Most of the surveyed CFOs would give up economic value in exchange for smooth earnings: they would decrease discretionary spending like R&D, advertising, or maintenance or delay starting a new projects in order to meet an earning target, even sacrificing value. In other words, they appear to be willing to burn "real" cash flows and not simply to rely on accounting manoeuvres for meeting accounting targets.

This traditional and apparently unchanged behavior in financial performance measurement seems to be confirmed by the empirical evidence that emerges from the most recent analysis about the most common financial metrics used in compensation plans, conducted in 2010 by the U.S. National Association of Corporate Directors (NACD) regarding about 1,300 individual from public company boardrooms across 24 industry sectors: profits and EPS (and similar ratios) weigh 97%, cash flow 36%, economic value measures like EVA and CFROI 16%, and stock price based measures 31% (multiple responses being allowed) (Daly 2011).

2.2 Economic Value Measures

2.2.1 *The General Framework*

While traditional accounting measures such as earnings per share and return on investment are the most common performance measures, they have been criticized for not taking into consideration the cost of capital and for being too much influenced by external reporting rules.

While the traditional **discounted cash flow (DCF) model** provides for a complete analysis of all the different ways in which a firm can create value, it could become complex, as the number of inputs increases. Moreover, it could be very difficult to tie management compensation systems to a DCF model, since many of the inputs need to be estimated and could be manipulated to produce the desired results.

However, instead of an explicit DCF model, a simplified formula-based DCF approach could be used by making simplifying assumptions about a business and its cash flow stream, such as for example constant revenue growth and margins, so that the entire DCF can be captured in a concise formula (Copeland et al. 1990). The Miller-Modigliani (MM) formula (Exhibit 2.1), although simple, is a

value of entity = value of assets in place + value of growth

$$\text{value of assets in place} = \frac{E(\text{NOPAT})}{r}$$

$$\text{value of growth} = \sum_{t=0}^{\infty} I(t) \times \frac{r^*(t) - r}{kr} (1+r)^{-(t+1)}$$

or simplifying,

$$\text{value of growth} = K [E(\text{NOPAT})] N \left[\frac{r^* - r}{r(1+r)} \right]$$

where:

$E(\text{NOPAT})$ = expected net operating profit after taxes

(assumed as proxy of expected cash flows after taxes)

r = cost of capital after taxes

$I(t)$ = additional investments in period t that will yield (starting in the period immediately following the investment) net profit at a constant rate $r^*(t)$

K = investment rate (% of cash flows invested in new projects)

N = intervals of competitive advantage

Exhibit 2.1 The Miller-Modigliani DCF formula

particularly useful example for demonstrating the sources of a company's value (Miller and Modigliani 1961). The MM formula values a company as the sum of the value of the cash flow of its assets currently in place plus the value of its growth opportunities. This formula, although too simple for real problem solving, can be used to illustrate the key factors that will affect the value of the company, and therefore show how the two components of value performance can be measured separately.

In addition, it has been stated that the NPV concept is useful only if we can discount the investment's complete cash flow over its completed economic life: in other words, the cash flow approach becomes significant only when it is considered over the life of the business, and not in any given year. In practice, it could serve as a measure of performance only if it could be periodized into years, quarters, months or the time period of the user's choice. In fact, this is what some "new metrics" try to do.

If we assume that markets are efficient, we could replace the unobservable value from the DCF model with the **observed market price**, and reward or punish managers based upon the performance of the stock. Thus, a firm whose stock price has gone up is viewed as having created value, while one whose stock price goes down has destroyed value. Compensation systems based upon the stock prices, including stock grants and warrants, have become a standard component of most management compensation packages. While market prices have the advantage of being updated and observable, they are also noisy. Even if markets are efficient, stock prices tend to fluctuate around the true value, and markets sometimes do

make big mistakes. Furthermore, a firm's stock performance seems to be much more reliable when evaluated over several years. Thus, a firm may see its stock price go up, and its top management rewarded, even as it destroys value. Conversely, the managers of a firm may be penalized as its stock price drops, even though they may have taken actions that increase firm value.

Summarizing, market value-based measures of performance can be affected by the following limitations:

- they reflect factors beyond managers' control, such as inflation and interest rates, for example. Actually, exogenous effects can be separated from the endogenous ones, but these corrections can be highly subjective
- they tend to aggregate relevant information in an inefficient manner for compensation purposes: their forward-looking character may result in compensating for promises and not for actual achievements
- they cannot be disaggregated beyond the firm level; thus, they cannot be used to evaluate the managers of individual divisions of a firm, and their relative performance; similarly they are not applicable to non-listed companies
- they can be influenced by investors' expectations which can be inconsistent with managers' rationale, because of the asymmetric information between investors and managers
- set as targets, they can increase the risk exposition of managers, distorting their risk perception when compared to the owners' risk perception; furthermore, managers should face the total risk and not only the systematic (or market) risk.

Nevertheless, a new emphasis on market value measure as the best metric for value creation is recently emerging. The Boston Consulting Group (BCG) remarks the following advantages of using **total shareholder return** (TSR) as the central metric of the entire corporate strategy process (Boston Consulting Group 2008):

- it incorporates the value of dividends and other cash pay-outs, which can represent anywhere from 20 to 40% (or even more) of a company's TSR;
- it integrates all the dimensions of the value creation system better than other accounting-based or cash-based metrics. We well know the pitfalls of accounting metrics. However, cash-based metrics by themselves could not capture the impact of improvements in the fundamental value on a company's valuation multiple or the full value of cash payments to investors. In fact, TSR performance can be broken down into the key drivers of value creation (as illustrated in Exhibit 2.2): (1) the growth of EBITDA (resulting from the combination of sales growth and change in margin) as an indicator of a company's improvement in fundamental value; (2) the change in the EBTDA multiple (the ratio of enterprise value—the market value of equity plus the market value of debt—to EBITDA) as a measure of how changes in investor expectation affect TSR; (3) the distribution of free cash flow to investors and debt holders (dividend yield, change in shares outstanding and net debt change) in order to measure the impact of paying out cash or raising new capital;

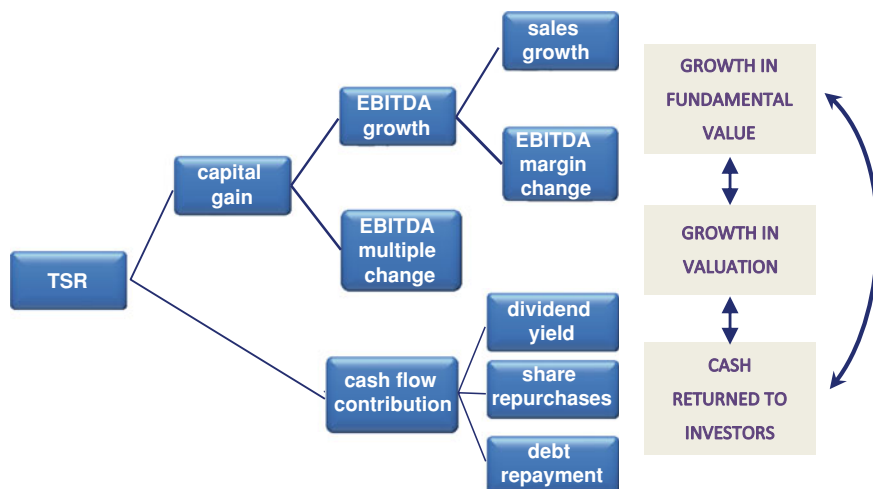


Exhibit 2.2 Drivers of TSR

source: Boston Consulting Group (2008)

- the minimum appropriate TSR goal is easy to establish: it will be set by either the company's cost of equity or the expected average TSR of its peer group (assuming that this average is higher than the cost of equity). Therefore, the firm can easily state how much higher it should reach, depending on the aspirations of the senior team and on its competitive advantages and management capabilities.

Yearly, BCG elaborates global and industry rankings based on a 5-year TSR performance (www.bcg.com).

To counter the objection that the TSR could not be disaggregated beyond the firm level, BCG proposed the total business return (TBR) such as the internal mirror of actual external TSR, to which is highly correlated. TBR represents the intrinsic capital gain and dividend yield from a business plan, either at the corporate or the business unit level. It permits to cascade down the overall TSR value creation aspiration into internal corporate and business unit goals. It can work as a planning tool to assess the value creation potential of a business plan and help managers close the gap between aspirations and performance (Boston Consulting Group 2001), also driving in this context a portion of long-term incentives for business unit managers. The TBR results from the change in estimated equity value and from the equity free cash flows, which are the equivalents of the change in share price and dividends of the TSR, respectively.

Similarly, Stern Stewart & Co. (hereafter Stern Stewart) recently focuses their companies performance rankings on two metrics that use the TSR: the wealth added index (WAI) and the relative wealth added (RWA) (Stern Stewart 2002,

2003). Both are monetary amounts and are calculated by multiplying the TSR excess return by the initial market value of equity. The TSR excess return is calculated as the difference between the TSR and, respectively in the WAI and RWA calculations, the cost of equity and the peer TSR (i.e., the average TSR of a defined group of peers). These two measures should correct the main limits of TSR:

- they reflect the relationship between the money injected into a company and the resulting returns for shareholders
- they take into account the investors' required return
- they are cash figures and not percentages
- they reflect the risks taken by an investor in the form of the required return.

Previously, Stewart (Stewart 1991) proposed the **market value added** (MVA) as an appropriate market-based metric for ranking companies according to how much value they have added to (or subtracted from) their shareholders' investment. MVA is measured as the difference between a company's fair market value (of company's total debt and equity capitalization) and the economic book value of capital employed in net assets. MVA should express the stock market's assessment of the net present value of all past and projected capital investments of a company: maximizing MVA should be the objective of any company that is concerned about maximizing its owners' wealth.

However, MVA appears inadequate to measure value creation (Weissenrieder 1998). In fact, shareholder's wealth is maximized by maximizing the difference between the firm's total value and the total capital that investors have committed to it, but we cannot define total capital as something derived from a company's balance sheet. The construction of the balance sheet is led by accountants and ruled by law, not by business reality or business logic. Firstly, the asset side of the balance sheet includes items such as non-strategic investments, prepaid expenses, inventories and supplies, etc. and it leaves out all strategic investments made in intangibles. Secondly, the time periods over which the assets are depreciated will not equal the actual economic life. Furthermore, these errors from the non-accounting point of view differ among both companies and lines of business. Finally, a company's balance sheet illustrates the capital base for the present value of the future cash flow from the business if no incremental strategic investments are made. The market value, by contrast, is the sum of the present value of the future cash flow from the business without any further strategic investment and the NPV of the cash flow from future strategic investments. Therefore, the MVA does not account for the value added of the business today but also includes the NPV of the company's future business (Weissenrieder 1998).

Consulting firms promoted a variety of "economic value" measures to overcome limitations of accounting-based and market-based measures. In this section the most known metrics are illustrated.

The more or less direct foundation for these *apparently new* performance measures is the concept of **residual income** (RI), developed many years ago (Worthington and West 2001). In the late nineteenth century Marshall stated that

for investors to earn *true economic profit*, sales must be sufficient to cover all costs, including operating expenses and capital charges. Later, the desirability of quantifying economic profit as a measure of wealth creation was operationalized by Solomons (1965) as the difference between two quantities, net earnings and cost of capital. As early as in the 1920's General Motors applied this concept and in the 1950's General Electric labelled it "residual income", applying it as a performance measure to their decentralized divisions. RI is defined in terms of after-tax operating profits less a charge for invested capital, which reflects the firm's weighted average cost of capital. Close parallels are thereby found in the related (non-trademarked) concepts of abnormal earnings, excess earnings, excess income, excess realisable profits and super profits (Biddle et al. 1997). Economic profit (EP) is a variant of RI, but such as a return on equity. It is the book profit less the equity's book value (at the beginning of the considered period) multiplied by the required return to equity. As ROE is the ratio of profit after taxes to book value of equity, we can also express the economic profit as $EP_t = (ROE - k_e)Ebv_{t-1}$, where Ebv_{t-1} is the initial book value of equity and k_e is the cost of equity. It is obvious that for the equity market value to be higher than its book value, ROE must be greater than k_e , if ROE and k_e are constant (Fernandez 2003).

2.2.2 Economic Value Added (EVA)

Stern Stewart's trademarked **economic value added** (EVA) is a proprietary adaptation of residual income. EVA is a modified version of residual income: the main modifications consist of accounting adjustments designed to convert accounting income and accounting capital to economic income and economic capital, respectively. Thus, the significance of the difference between EVA and residual income is dependent on the impact of these accounting adjustments.

EVA is determined as adjusted operating income minus a capital charge, and assumes that a manager's actions only add economic value when the resulting profits exceed the cost of capital.

$$\begin{aligned} EVA &= NOPAT - \text{costofcapital} \times \text{capitalinvested} \\ &= (ROIC - \text{costofcapital}) \times (\text{capitalinvested}) \end{aligned}$$

where

NOPAT = net operating profit after taxes

ROIC = return on invested capital = NOPAT/capital invested

According to EVA, the following strategies can be implemented to create value:

1. increasing EVA through improvements in ROIC (for example increasing asset turnover or repairing assets or structuring deals that require less capital);

2. investing in profitable growth, which means investing until ROIC exceeds the cost of capital;
3. reducing investments (and debts used to finance them) whose ROIC is less than the cost of capital (for example getting rid of unprofitable business);
4. increasing EVA by reducing the cost of capital, for example by designing capital structures that minimize the cost of capital.

We need three basic inputs for EVA's computation: the return on capital earned on an investment, the cost of capital for that investment and the capital invested in it.

We can estimate NOPAT in two ways (Damodaran 2000). One is to use the reported EBIT on the income statement and to adjust this number for taxes: $\text{NOPAT} = \text{EBIT} (1 - \text{tax rate})$. When we use this computation, we ignore the tax benefit of interest expenses since it is already incorporated into the cost of capital (by an after-tax cost of debt). Alternatively, we can arrive at NOPAT by starting with net income as follows: $\text{NOPAT} = \text{net income} + \text{interest expenses} (1 - \text{tax rate}) - \text{non-operating income} (1 - \text{tax rate})$. Adding back the after-tax portion of interest expenses ensures that the tax benefit from debt does not get double counted.

It is more difficult to estimate the capital invested at the level of the firm than of a single project, because in a firm projects tend to be aggregated and expenses are allocated across them. One obvious solution may be to use the market value of the firm, but market value includes capital invested in assets in place as well as in expected future growth. If we want to evaluate the quality of assets in place, we need a measure of the market value of just these assets. Given the difficulty of estimating the market value of the assets in place, many analysts use the book value of capital as a proxy for the market value of capital invested in assets in place (Damodaran 2000). The "refined economic value added" (REVA), elaborated by Bacidore et al. (1997), calculates EVA applying the cost of capital to the opening market value (rather than book value) of the firm's equity plus debt.

We can measure invested capital in two ways. The *capital-based approach* considers the book values of equity and interest bearing debt (net of cash balances). The *asset-based approach* could arrive at a similar result using the book values of the assets of the firm as follows:

$$\begin{aligned} \text{invested capital} &= \text{net fixed asset} + \text{current asset} - \text{current liabilities} - \text{cash} \\ &= \text{net fixed asset} + \text{non-cash working capital}. \end{aligned}$$

The two approaches could give non-equivalent results when the firm has long-term liabilities that are not interest bearing debt (for example personnel provisions and similar): they will be excluded from the invested capital computation when we use the capital approach. The reason we net out cash is consistent with the use of operating income as our measure of earnings. The interest income from cash or cash equivalents is not included in the operating income. Correspondingly, we have to consider the capital invested in operating assets only. In addition, the

effects that dividends and stock buybacks have on returns can be viewed as an argument for using return on capital invested without cash balances. In fact, the return on equity of a firm that pays a large dividend or buys back stock will increase after the transaction because the book value of equity will decrease disproportionately, relative to the net income (in fact, the after-tax interest income earned on cash balances is generally smaller than the return on invested capital). This impact on book value of capital of stock buybacks is especially disproportionate when market value is significantly higher than the book value: in fact the book value of equity is reduced by the market value of the buyback; if the price to book ratio is for example 10, a buyback of 5% reduces the book value of equity by 50%.

However, it should be noted that, for companies with significant cash balances, the exclusion of cash from the invested capital and of its interest income from the NOPAT could make managers fail to use cash balances efficiently.

The book value, however, is a number that reflects not just the accounting choices made in the current period, but also the accounting decisions made over time on how to depreciate assets, value inventory and deal with acquisitions. In addition, it is influenced by the accounting classification of expenses into operating and capital expenditures, only the latter being part of the capital invested (Damodaran 2000). The limitations of book value as a measure of capital invested has led analysts who use EVA to adjust the book value of capital to get a better measure of capital invested.

Similar problems arise when we need to estimate NOPAT. The operating income that we would like to estimate would be the operating income generated by assets in place. The operating income, usually measured as earnings before interest and taxes in an income statement, may not be a good measure of this figure, for the same reasons that lead to adjust the book value of capital invested.

The practitioners who use EVA claim to make many adjustments to the accounting measures of both operating income and invested capital. Stern Stewart makes as many as 164 adjustments to arrive at EVA.

Exhibit 2.3 summarizes some of the adjustments recommended by Stern Stewart (Stewart 1991) for converting from book value and book NOPAT, on the one hand, to what it calls economic book value and economic NOPAT, on the other hand.

Some of these adjustments include (Damodaran 2000):

- **capitalizing any operating expense that will create income in future periods, although required to be expensed by accounting standards.** Some examples are: research and development (R&D) expenses, training and development, brand marketing, advertising, etc. The capital invested should be adjusted by capitalizing R&D expenses and augmenting by accrued R&D expenses, net of cumulative amortization. Correspondingly, the operating income should be considered without these expenses, but decreased by the annual amortization of these capitalized expenses. Making this adjustment for high-technology firms will drastically alter their return on capital, reducing it considerably in most

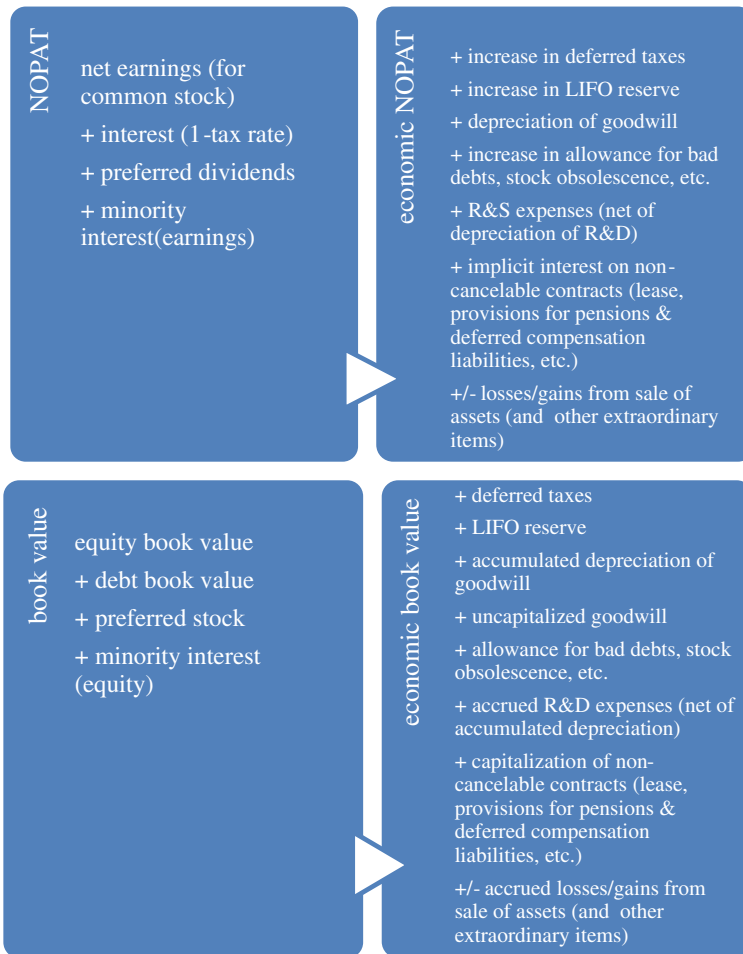


Exhibit 2.3 Adjustments suggested by Stern Stewart for calculating the EVA

cases. Once you capitalize R&D, any new R&D increases this asset, but the existing R&D will be amortized over time, reducing it. The rate at which the R&D is amortized will be sector-specific and reflect the rate at which the benefits of new R&D decay in the sector;

- **capitalizing any operating expenses that mask financing expenses.** Common examples are lease expenses, which reduce the operating income in the period in which they are paid. From a financial standpoint, there is a little difference between operating and capital leases. Therefore, it does make sense to treat them homogeneously. Conversely, the accounting standards normally suggest adjusting for capital leasing but not for operating leasing. The standard adjustment operates as follows: the capital invested should be increased by the

present value of the future lease commitments, which is treated as debt. On the contrary, the operating income should be decreased yearly only by the depreciation expense of leased asset and not by the entire lease payment. In fact, the interest portion of the lease payment is an interest expense and should affect the cost of capital. A similar adjustment regards provisions for pensions and other deferred compensation liabilities: they should be considered equivalent to debts and therefore included in the capital invested, and their implicit financial costs should be added back to NOPAT, since they should affect the cost of capital. For example, in Italy, “TFR” costs per year add up to $1.5\% + 75\%$ of inflation rate;

- **eliminating any items that modify the capital book value and the accounting earnings, without really impacting the invested capital and the economic income.** For example, the amortization of goodwill, that reduces the book value of capital but does not reduce the capital invested, should be added back; correspondingly, we should consider the earnings before amortization of goodwill. However, only the part of goodwill referred to the asset in place should be included in the invested capital: it can be measured as a difference between the acquisition price and the market value prior to acquisition.

Other examples of this kind of correction are the following.

Firstly, allowances for bad debts, stock obsolescence and similar items: they should be assimilated to equity reserves and therefore included in calculating the capital invested; correspondingly, changes (net of taxes) in these allowances should be added back to NOPAT. In this way, since these changes equal provisions less utilizations in the current year, NOPAT is affected only by the cash utilizations of this allowances, i.e. when the losses or the minor inflows occur. Secondly, the LIFO reserve. The LIFO reserve is the difference between the accounting cost of an inventory calculated using the FIFO method, and one using the LIFO method. In a typical inflationary environment, the value of a FIFO inventory is higher than the value of a LIFO inventory, so that the value of the LIFO reserve is : $\text{LIFO reserve} = \text{FIFO valuation} - \text{LIFO valuation}$. Since the reason for valuing an inventory using LIFO is usually to defer the payment of income taxes, the LIFO reserve essentially represents the amount by which an entity's taxable income has been deferred by using the LIFO method. The reserve should be added to invested capital and year-to-year increase to be added back to NOPAT.

Thirdly, the one-time restructuring charges, which largely reduce the book value of capital. Assume, for example, a mediocre investment that earns only a 5% on continuing basis. However, let us assume that we write off half the investment, reducing the capital invested. Using the updated invested capital figure, the return on capital is now 10%, but the quality of the investment has not changed. To counter this, we should adjust the reported capital base for actions taken by the firm to reduce that base, but making this adjustment is much more difficult to do than adjusting earnings, since the effect on capital is cumulated (all restructuring charges, taken over time by the firm, affect the current capital invested). Similarly, we have to eliminate all the extraordinary items from the calculation of income and invested capital. As a general rule, we should

consider the earnings before any extraordinary item. For example, losses from sales of assets should be added back to net income, as well as gains should be subtracted. The capital invested should be adjusted similarly, in order to account for the actual impact of dismissals. For example, by adding back losses from sales of assets, we decrease the invested capital by the actual after-tax cash flow that would result from the asset sale. In fact, the book value would result decreased by the difference between the asset's original cost less the amount of accumulated depreciation. After such an adjustment, the economic value of the capital invested is just decreased by the asset's net liquidation value.

- **adjusting for any change in book value of capital that was hidden because of accounting treatment.** For example, when pooling is used to account for a merger, the book value remains in the balance sheet and the goodwill is ignored, i.e. is treated in the same way as an internally generated goodwill; therefore, the book value of capital should be corrected, augmenting it to reflect the price paid on the acquisition and the premium over book value. Note that the proportion of the premium paid for the expected future growth potential in the acquired firm should not be added on to arrive at capital invested since we need to estimate the capital invested in assets in place.

It is useful to reflect on the tax impact of making the above discussed adjustments. Generally speaking, if we add back to NOPAT the R&D costs previously expensed, we implicitly include the tax shield of these expenses in the NOPAT calculations. By contrast, if we add back the R&D expenses after taxes [i.e., the gross amount multiplied by $(1 - \text{tax rate})$], we ignore it. Similarly, if we add back to NOPAT the R&D expenses minus the annual amortization of the capitalized R&D expenses, both after taxes, we are only considering the tax shield associated with the amortization.

The above are only some of the many suggested adjustments. Young and O'Byrne (2001) admit that “...even the most ardent EVA advocate would concede that no company should make more than, say, 15 adjustments”.

These authors further state that 10–12 accounting adjustments used to be most common, but that number has now declined to five or fewer, and in some case no adjustments are made. The explanations they give for this reduction are twofold: (a) managers are reluctant to deviate from GAAP-based numbers; (b) companies have found that most of the suggested adjustments have little impact on profit and capital.

Moreover, external analysts who choose to use EVA have to accept the reality that their estimates of operating income can be adjusted only for the variables on which there is public information.

Anderson et al. (2005) found that, in a sample of 317 USA firms over a 10 year time period, five accounting adjustments yielded on average an EVA only 7.1% lower than the EVA reported by Stern Stewart for the same firms and time period. The two accounting adjustments with the largest impact, the R&D and LIFO reserves, accounted for 92% of the total change in EVA due to the five accounting adjustments. The inconsistency over time of the differences, both in absolute and

percentage terms, between Stern Stewart's EVA and Anderson et al.'s adjusted EVA, does not support the need for a large number of accounting adjustments. In addition, evidence shows a strong instability of the EVA adjustments over time and a very strong correlation between adjusted and unadjusted EVA. Therefore, accounting adjustments for EVA seem to be much to do about nothing.

The third and final component needed to estimate the economic value added is the cost of capital, which can be measured by the weighted average cost of capital. Stern Stewart suggests the use of the capital asset pricing model (CAPM) to estimate the cost of equity. A school of thought argues that in estimating the weighted average cost of capital the book value weights for debt and equity should be used, since both the return on capital and the capital invested are measured in book value terms. This argument does not really convince, for the following reasons (Damodaran 2000).

Firstly, we use the book value of capital for measuring the capital invested, but we want to estimate the market value of the assets in place. Therefore, using a book value cost of capital is essentially equivalent to assuming that all the debt is attributable to the assets in place, and that all the future growth comes from equity. It means that we would discount cash flows from the assets in place at the book cost of capital, and all cash flows from the expected future growth at the cost of equity.

Secondly, using a book value cost of capital for all the economic value added estimates, including the portion that comes from future growth, will destroy the basis of the approach, which is that maximizing the present value of economic value added over time is equivalent to maximizing firm's value.

Thirdly, being the capital structure a lever that increases EVA by decreasing the cost of capital, the market value cost of capital is more appropriate in this context, than the book value cost of capital.

Finally, from a practical view, using the book value cost of capital will tend to understate the cost of capital for most firms, and will understate it more for more highly levered firms than for less levered firms. Understating the cost of capital will lead to overstating the EVA. Thus, rankings based on the book value cost of capital are biased against firms with less leverage, and biased towards firms with high leverage.

2.2.3 Cash Flow Return on Investment (CFROI)

A second economic value measure that has received considerable attention is the **cash flow return on investment (CFROI)** and its variants, proposed by HOLT Value Associates and Boston Consulting Group.

CFROI is essentially a modified version of internal rate of return (IRR), designed for investments that have already been made. The CFROI of a firm is compared to the cost of capital to evaluate whether a company's investments are good, neutral or poor. To enhance its value, then a firm should increase the spread between its CFROI and its cost of capital.

CFROI is calculated using **four inputs** (Damodaran 2000). The first input is the **gross investment** (GI) that the firm has in its assets in place. This is computed by adding back depreciation to the net asset value to arrive at an estimate of the original investment in the asset. In addition, non-debt liabilities (allowances) and intangibles such as goodwill should be subtracted. Finally, the gross investment is converted into a current dollar value to reflect the inflation that has occurred since the asset was purchased.

The second input is the **gross cash flow** (GCF) earned in the current year on that asset. This is usually defined as the sum of the after-tax operating income of a firm and the non-cash charges against earnings, such as depreciation and amortization. The operating income should be adjusted for operating (and capital) leases and any accounting effects, much in the same way that it was adjusted for in computing EVA (as well as GI).

The third input is the **expected life** of the assets in place (n), at the time of the original investment, which varies from industry to industry but reflects the earning life of the investments in question.

The expected value of the assets (the **salvage value** = **SV**) at the end of this life, in current dollars, is the final input. This is usually assumed to be the portion of the initial investment, such as land and buildings, that is not depreciable, adjusted to current dollar terms (practitioners include also inflation-adjusted current assets).

CFROI is the internal rate of return of these cash flows, i.e., the discount rate that makes the net present value of the gross cash flows and salvage value equal to the gross investment, and can thus be viewed as a composite internal rate of return, in real terms. This is compared to the firm's real cost of capital to evaluate whether the assets in place are value creating or value destroying. The real cost of capital can be estimated using the real costs of debt and equity and market value weights for debt and equity. However, according to the HOLT methodology (Credit Suisse-HOLT 2011), the firm-specific discount rate does not rely on the traditional CAPM-based estimates of the cost of capital, but is defined as a forward-looking discount rate, directly tied to the model's forecasting procedures for a firm's future cash flow stream³ It is calculated in each country by observing market-implied discount rates across all companies in that country, which differ for two fundamental risk factors: liquidity risk (i.e., size risk differential) and credit risk (i.e., leverage risk differential). Hence, each company-specific discount rate is measured beginning with the country base (i.e., the discount rate for a standard company with a certain market capitalization and leverage) and adjusting it by market-specific differentials based on company-specific size and leverage. For all the European countries (excluding the UK), a Continental Europe base rate and Continental Europe differentials are used rather than country-specific base and differentials.

³ A company-specific, market-implied discount rate is that rate which equates a company's forecasted net cash receipts to the company's current market value (Credit Suisse-HOLT 2011).

$$GI = GCFa_{n/CFROI} + \frac{SV}{(1 + CFROI)^n}$$

An alternative formulation of the CFROI allows for setting aside an annuity to cover the expected replacement cost of the asset at the end of the project life. This annuity is called the **economic depreciation** and it is computed as follows:

$$economic\ depreciation = \frac{replacement\ cost\ in\ current\ dollars}{((1 + k)^n - 1)/k}$$

Where n is the expected life of the asset, and the expected replacement cost of the asset is defined in current dollar terms to be the difference between the gross investment and the salvage value. The CFROI for a firm or a division can then be written as follows:

$$CFROI = (Gross\ Cash\ Flow - Economic\ Depreciation) / Gross\ Investment$$

The Appendix 1 shows the equivalence between the two formulas, when we assume, in deriving the economic depreciation, a discount rate $k = CFROI$. The differences in the discount rate assumptions account for the difference in CFROI estimated using the two methods above. In the first formula the intermediate cash flows are discounted at the CFROI, while in the second, at least the portion of the cash flows that are set aside for replacement, get reinvested at the cost of capital.

The IRR can be considered the basis for the CFROI approach. In investment analysis, the IRR on a project is computed using the initial investment on the project and all cash flows over the project's life. The IRR calculation can be done entirely in nominal terms, in which case the internal rate of return is a nominal IRR and is compared to the nominal cost of capital, or in real terms, in which case it is a real IRR and is compared to the real cost of capital.

At first sight, the CFROI seems to do the same thing. It uses the gross investment (in current dollars) in the project as the equivalent of the initial investment, assumes that the gross current-dollar cash flow is maintained over the project life and computes an internal rate of return. There are, however, some significant differences (Damodaran 2000):

- the IRR does not require the after-tax cash flows to be constant over a project's life, even in real terms, while the CFROI approach assumes that the real cash flows on assets do not increase over time. However, the CFROI formula can be modified to allow for real non-linear growth
- the second difference is that the IRR on a project or asset is based upon incremental cash flows in the future. It does not consider cash flows that have already occurred, which are considered as sunk. The CFROI, on the other hand, tries to reconstruct a project or asset, using both cash flows that have occurred already and cash flows that are yet to occur. The implications are relevant: a CFROI that exceeds the cost of capital is usually considered a sign that a firm is using its assets well, but this is not true when the IRR is less than the cost of capital.

From the CFROI we can derive the cash value added (CVA), by multiplying the spread between CFROI and cost of capital by the inflation-adjusted gross investment; or, alternatively, by subtracting from the gross cash flow both economic depreciation and capital charge. Note that this CVA figure differs from the indicator we will illustrate below. It can be considered a metric equivalent of CFROI but expressed in absolute terms; therefore, it can be easily compared to EVA, with respect to which it avoids some accounting distortions, particularly remarkable in capital intensive businesses.

2.2.4 Shareholder Value Added (SVA)

The third economic measure is the **shareholder value added** (SVA) elaborated by Rappaport (1986) and LEK/Alcar Consulting Group and directly based on DCF logic. The key-factors in determining SVA are the following:

- growth rate of sales
- rate of operating profit margin (net of depreciation)
- (cash) tax rate
- rate of incremental fixed capital investment, in terms of rate of capital intensity of sales, net of depreciation (depreciation is implicitly considered equal to the replacement investment of fixed capital)
- rate of incremental working capital investment (in terms of rate of working capital intensity of sales)
- cost of capital, expressed in terms of weighted average cost of capital (WACC)
- value growth duration (planning period or competitive advantage period). It corresponds to the length of time during which the firm is expected to earn returns in excess of its cost of capital. It depends on how quickly company's strategies are more or less emulated by potential competitors.

These variables are combined in the following model in order to measure the value creation of a strategy (valid both in backward and forward-looking valuations):

*value created by strategy = change of shareholder value generated by strategy
(with respect to non-strategy scenario)*

shareholder value = gross corporate value – market value of debt and other obligations

gross corporate value = present value of operating cash flows (during the forecast period) + terminal value (at the end of the forecast period) + cash & cash equivalents and non-operating assets (whose returns are excluded from the operating cash flows)

operating cash flow_t = sales_{t-1} × (1+growth rate of sales) × rate of operating profit margin × (1- tax rate) – (sales_t – sales_{t-1}) × rate of incremental investment in fixed assets and working capital.

Cash flows and terminal value are discounted by the cost of capital.

The terminal value at the end of the forecast period can account for a great or small part of a company's (or business unit's) market value, depending on whether the firm is adopting a growth or an harvesting strategy.

The terminal value can be determined by using different approaches in different situations. It can be estimated as a liquidation value, when the firm ceases operations at the end of the forecast period, or as an equilibrium-state value of the ongoing firm, using a perpetuity of the net operating cash flow at the horizon, assuming a steady-state beyond this term or a constant rate of growth, continuing indefinitely. It should be observed that assuming a constant operating cash flow beyond the end of the forecast period does not imply a non-growth state of the business, but that the future new investments' rate of return is equal to their cost of capital; thus, incremental cash flows can be ignored in calculating the value of business. Alternatively, a multiple approach could be used.

While skewed versus future performance, SVA can measure historical performance periodically in terms of superior SVA, expressed as difference between actual and expected SVA, in a medium term span. This measure should correctly orient the operating managers to find strategies with the highest potential for increasing value, avoiding the short-term performance obsession.

2.2.5 *Economic Margin (EM)*

The **economic margin** (EM) calculation is based on three components—operating cash flow, invested capital, and a capital charge—and is measured as follows:

$$EM = \frac{\text{operating cash flow} - \text{capital charge}}{\text{invested capital}}.$$

EM is considered by its advocates as a unique mixture of the two metrics EVA and CFROI, designed to capture the best qualities of each one (Obrycki and Resendes 2000).

The numerator of the EM is based, like EVA, on economic profit, which helps managers focusing on value creation. Furthermore, it shares with EVA the most common adjustments that clean up the accounting data. Unlike EVA, however, EM adds depreciation and amortization to determine cash flow, and instead explicitly incorporates the return of capital in the capital charge. Second, like CFROI, EM is based on inflation-adjusted gross assets, which helps to avoid the growth “disincentive” typically associated with net asset based measures. The capital charge is identical to a mortgage payment. The key difference between an EM capital charge and a mortgage payment is that when calculating a mortgage payment, the entire investment amount owed to the bank is treated as a depreciating asset. For most companies, however, part of their assets are non-depreciating (such as working capital) and can be returned to investors if the company is

liquidated when its existing assets run out. Therefore, the capital charge is the annuity (at the cost of capital) that is due for the asset life in order to pay back the present value of the invested capital, net of the non-depreciating assets. The capital charge includes both the **return on capital** (the cost of capital rate on the initial invested capital) and the **return of capital** (the part of invested capital paid back each year).

Unlike CFROI, EM incorporates the investors required return on capital in its capital charge, and therefore it is a direct measure of shareholder wealth creation. A company with a positive EM should create wealth, a zero EM should maintain wealth, and a negative EM should destroy wealth. In addition, since the EM concept is derived from the economic profit, it is easier to communicate and set goals: for example, it is very easy to know the incremental cash flow required to obtain a 10% increase in the EM by multiplying EM by the per cent increase by gross investment.

2.2.6 Cash Value Added (CVA)

The **cash value added** (CVA) is based on a net present value (NPV) model and periodizes the NPV calculation into years, months or the time period of the user's choice, and does not need to discount the investment's overall cash flows over its overall economic life (Weissenrieder 1998). It classifies investments in two categories, strategic and non-strategic, where the former (either in tangible or intangible assets) are investments whose objective is to create new value for shareholders, while the latter are investments made to maintain the value created by the strategic investments. Therefore, a strategic investment is followed by several non-strategic investments, which are considered as costs, while the business unit's capital base is the aggregate of every strategic investment's operating cash flow demand (OCFD). The OCFD is calculated as the cash flow, in real-term equal amounts every year, that, discounted using the appropriate cost of capital, will give the investment a null NPV over the strategic investment's economic life (it is a real annuity adjusted for actual annual inflation). The OCFD from each investment is the same in real terms every year, but it increases in nominal terms for two reasons: the inflation adjustment and, at an aggregate level, the new strategic investments. The CVA represents the value creation from the shareholders' standpoint, and can be expressed (by using yearly, monthly or quarterly data) as a difference between the operating cash flow (OCF) and the OCFD. OCF is measured as follows:

$$\begin{aligned} OCF &= \text{operating surplus} \\ &\quad - \text{working capital change} - \text{non strategic investments} \end{aligned}$$

where operating surplus is equal to sales—costs (costs do not include depreciation and similar accounting items).

The CVA can be also expressed as an index (CVA index) if we calculate the ratio between OCF and OCFD (Weissenrieder 1998). In addition, in order to make explicit the main five value drivers (in relation to sales), we can express CVA as follows:

$$\begin{aligned}
 CVA &= sales \times \left(\frac{\frac{operating\ surplus}{sales} - \frac{working\ capital\ movement}{sales}}{-\frac{non\ strategic\ investments}{sales} - \frac{OCFD}{sales}} \right) \\
 &= sales \times \left(\frac{operating\ surplus\ margin - WCM\ margin -}{non\ strategic\ investments\ margin - OCFD\ margin} \right)
 \end{aligned}$$

The CVA uses the same original figures as EVA, but the conclusion will be different. If we assume, for example, a ten-year steady growth scenario, that is expansion in identical investments with a positive NPV, the EVA of a single project is negative in the first years, but in the remaining years (until the end of the investment) it becomes increasingly positive. At the aggregate level, the growth will show poor profitability for a number of years, but profitability will boost after the expansion is stopped. It means that from the EVA's point view, the managers responsible for the expansion will be judged unprofitable, while the managers that stopped it probably will be judged very successful, and correspondingly rewarded if the bonus is based on the change in EVA from year to year.

By contrast, if we use the CVA approach, we have a CVA index stable for the entire considered period, at both the single and the aggregate investment level. Both OCF and OCFD, although equal in real terms, are increased by inflation, and the investment has the same profitability over time (if the investments create value, growth will be rewarded from the first year). At the aggregate level, both increase by inflation and by investment rate until the first investment run out, then they decrease with the running out-rate. Note that in a simplistic example, the NPV of the EVAs equals the NPV of the CVAs.

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