BiH BANKRUPTCY AND LIQUIDATION LAWS:

Collection of Valuation Materials for Training and Practical Use by Appraisers

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COLLECTION OF VALUTION MATERIALS

FOR TRAINING AND PRACTICAL USE

BY APPRAISER'S

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1. INTRODUCTION

This collection of valuation materials for appraisers is compiled for the purpose of supporting training activities, such as seminars, but it also may be used as a practical guide on a daily basis by appraisers and other professionals dealing with business valuation in BiH. It provides an easy to use reference, presenting various potentially applicable approaches, methods and formulas for completing an appraisal. It also provides sets of check lists and procedural guides, including review and audit materials for previously completed appraisal reports. This set of documents will be updated and supplemented from time to time in accordance with the on-going needs of the local expert users.

The undeveloped state of the appraiser system in BiH at this time and the urgent need for more accelerated implementation of market value financial techniques have helped shape these materials to correspond with the actual situation in BiH. This valuation manual should provide a quick reference to the most commonly used definitions, formulas, procedures and techniques for everyday business valuation problems. This book will be published in loose leaf (notebook), and electronic formats. Loose leaf versions will be distributed to all appraisers and trustees in BiH who attend business valuation training seminars conducted by FILE. Electronic versions will be distributed via the FILE Project website and on CD Rom.

The next step in the process of preparing this book is to obtain input from Bosnian professionals to confirm that it serves their needs and to make adjustments, accordingly. We will also continue to collect forms and examples, and case studies that could demonstrate the use of various valuation techniques in BiH practice, will complement the current collection of valuation materials.

A critical step in the area of bankruptcy implementation is that of developing a cadre of competent, knowledgeable and effective appraisers with the skills and tools necessary to deal efficiently with the numerous issues they will face in carrying out their roles. A number of obstacles will have to be addressed to achieve this goal:

This collection of materials consists of 6 main sections covering: valuation basics, the data gathering process, financial analysis, guidelines for wring an appraisers' report, and procedures for the review and audit of an appraisers' report.

Additionally the collected materials could contribute to the following subjects of Appraisal:

- Relationship between Appraisal methodology and the Purpose of the Appraisal
- Gift, Estate, Inheritance Tax – *(fair market value)*
- Selling out, Merging, Acquiring, or Divesting *(investment value)*
- Going Public
- Buy-Sell Agreements
- Marital, Partnership and Corporate dissolutions
- Damage Cases
- Bankruptcy Liquidations/Reorganizations

2. VALUATION BASICS:

2.1. Valuation basics, approaches and standards of value

International Valuation Standards define the concepts & principles of /Price, Cost, Market & Value:

- *Price* is a term used for the amount asked, offered, or paid for a good or service. Sale price is an historical fact, whether it is publicly disclosed or kept confidential. Because of the financial capabilities, motivations, or special interests of a given buyer and/or seller, the price paid for goods or services may or may not have any relation to the value which might be ascribed to the goods or services by others. Price is, however, generally an indication of a relative value placed upon the goods or services by the particular buyer and/or seller under particular circumstances.
- *Cost* is the price paid for goods or services or the amount required to create or produce the good or service. When that good or service has been completed, its cost is an historical fact. The price paid for a good or service becomes its cost to the buyer.
- A *market* is the environment in which goods and services trade between buyers and sellers through a price mechanism. The concept of a market implies that goods and/or services may be traded among buyers and sellers without undue restriction on their activities. Each party will respond to supply-demand relationships and other price setting factors as well as to the party's own capacities and knowledge, understanding of the relative utility of the goods and/or services, and individual needs and desires. A market can be local, regional, national, or international.
- *Value* is an economic concept referring to the price most likely to be concluded by the buyers and sellers of a good or service that is available for purchase. Value is not a fact, but an estimate of the likely price to be paid for goods and services at a given time in accordance with a particular definition of value. The economic concept of value reflects a market's view of the benefits that accrue to one who owns the goods or receives the services as of the effective date of valuation.

Classic theory teaches that there are basically three common approaches to Value:

- Discounted Income Approach
- Asset Appraisal Approach
- Comparative appraisal approach

The Cost Approach considers the possibility that, as a substitute for the purchase of a given property, one could construct another property that is either a replica of the original or one that could furnish equal utility. In a real estate context, one would normally not be justified in paying more for a given property than the cost of acquiring equivalent land and constructing an alternative structure, unless undue time, inconvenience, and risk are involved. In practice, the approach also involves an estimate of *depreciation* for older and/or less functional properties

where an estimate of cost new unreasonably exceeds the likely price that would be paid for the appraised property.

The Sales Comparison Approach considers the sales of similar or substitute properties and related market data, and establishes a value estimate by processes involving comparison. In general, a property being valued (a subject property) is compared with sales of similar properties that have been transacted in the open market. Listings and offerings may also be considered.

The Income Capitalization Approach. This comparative approach considers income and expense data relating to the property being valued and estimates value through a capitalization process. Capitalization relates income (usually a net income figure) and a defined value type by converting an income amount into a value estimate. This process may consider direct relationships (known as *capitalization rates*), yield or *discount rates* (reflecting measures of return on investment), or both. In general, the principle of substitution holds that the income stream which produces the highest return commensurate with a given level of risk leads to the most probable value figure.

Depreciated Replacement Cost (DRC) is an acceptable method used to arrive at a surrogate for the *Market Value* of specialized properties. The method is commonly applied in a valuation situation involving a property for which there are no readily available or otherwise dependable market data to analyze in developing a *Market Value* estimate.

Each valuation approach has alternative methods of application. The Appraiser's expertise and training, local standards, market requirements, and available data combine to determine which method or methods are applied. The reason for having alternative approaches and methods is to provide the Appraiser with a series of analytical procedures which will ultimately be weighed and reconciled into a final value estimate, depending upon the particular type of value involved. Valuation approaches and methods are generally common to virtually all types of valuation, including real property, personal property, businesses, and financial interests. However, valuation of different types of property involves different sources of data that appropriately reflect the market in which the property (and/or service or business) is to be valued. For example, individual buildings are commonly sold and valued in the relevant real estate market whereas the values of the shares of stock in a property company that owns a number of buildings are reflected by pricing in the relevant shares market.

Each approach comprises different methods. Some of the most commonly used ones are listed below:

- Discounted Future Earnings or Cash Flow (DCF)
- Capitalization of current, normalized, or historical earnings
- Capitalization of current, normalized, or historical cash flow
- Capitalization of dividends or dividends capitalization capacity
- Multiple of gross revenue or physical volume
- Excess earnings approach
- Adjusted net asset value
- Ratio of price to book value or adjusted net asset value
- Prior transactions in or offers for the stock adjusted to current conditions

Standards of Value:

- ***Highest and Best Use Value*** – The most probable use of a property which is physically possible, appropriately justified, legally permissible, financially feasible, and which results in the highest value of the property being valued.
- ***Land*** is regarded as a permanent asset, but improvements upon or to the land have a finite life. Because of the immobility of land, each real estate parcel possesses a unique location. Land's permanence also means that it will normally be expected to outlast uses and improvements, which have a finite life. The unique characteristics of land determine its optimal utility. When improved land is valued separately from improvements to or upon the land, economic principles require that improvements to or on the land be valued as they contribute to or detract from the total value of the property. Thus, the Market Value of land based upon the "highest and best use" concept reflects the utility and the permanence of land in the context of a market, with improvements constituting the difference between land value alone and total Market Value as improved
- ***Fair Market Value*** – "… the cash or cash equivalent, price at which property would change hands between a willing buyer and a willing seller, both being adequately informed of the relevant facts and neither being compelled to buy or sell…"
- ***Fair Value*** – "…the same as FMV, but more generic *(disregards premiums and discounts)*…"
- ***Investment Value*** – "…while market value could be called – the value of the market place, the Investment Value is the specific value of goods or services to a particular investor (or class of investors) for individual investment reasons. Differs from FMV by:
  - Estimates of future earning power
  - Differences in perception of the degree of risk
  - Difference in tax status
  - Synergies with operations controls or owned, etc.…"
- ***Going-Concern Value*** – "…is not a value but rather assumption about the business's status. Could be estimated as *Fair Market Value, Fair Value or Investment Value* on a going-concern basis, i.e., should be understand as the total value of the entity as a going concern…. understood also as excess value of intangible assets (good will)…"
- ***Liquidation Value*** – "… the net amount the owner can realize if the business is terminated and the assets are sold off piecemeal… *Orderly liquidation* – the sale of assets over reasonable time period in attempt to get the best available price for each asset… *Forced liquidation* – sale of assets as quickly as possible, frequently all at one time at an auction sale…"
- ***Book Value*** – "… is not a standard of value, but an accounting term, not an appraisal term… It represents historical cost less depreciation and amortization and less liability accounts as shown on a balance sheet…"

2.2. Valuing Companies in Bankruptcy Reorganizations

When planning, negotiating, and executing a reorganization, one of the most important considerations is how the reorganization is likely to affect the value of the firm as an ongoing concern (its "enterprise value"). The change in firm value affects the wealth the firm's shareholders and other claimholders, and therefore whether they will support or oppose the reorganization. The change in firm value also provides claimholders with important information about management's abilities and motives. When a reorganization is negotiated or determined by a vote, disputes over what the firm is worth can be costly by delaying agreement on a reorganization plan, or by preventing any agreement from being reached, Creditors, managers, investors, and others affected by a reorganization can therefore greatly benefit from knowing how to estimate value, and knowing which of the different methods available is likely to work best in a given situation.

Further is illustrated how enterprise value can be estimated using alternative discounted cash flow techniques, and market value multiples for comparable companies or transactions. Specific numerical examples are used to show how the methods differ, and to highlight the relative strengths and weaknesses of alternative approaches in the context of corporate reorganization. A list of selected references on valuation appears at the end of the note.

2.2.1. Discounted Cash Flows

Discounted cash flow models measure enterprise value as the discounted present value of all expected future cash flows available to the firm's stockholders and creditors ("cash flows to capital"). Exhibit 1 highlights three alternative discounted cash flow valuation models: the Adjusted Present Value (APV) method, the Capital Cash Flow (CCF) method, and the Weighted Average Cost of Capital (WACC) method. Under all three methods, there are two primary sources of enterprise value:

(1) Cash flows generated by the firm's assets and operations (its "business"), and

(2) Cash flows generated by various tax shields, principally interest expense and net operating loss carryforwards (NOLs).

The methods differ in how they mechanically calculate cash flows for discounting purposes, and in what discount rate(s) they use to calculate the present value of the cash flows.

2.2.2. The Discount Rate

In general, the discount rate is estimated using the Capital Asset Pricing Model (CAPM), which provides a formula for calculating the expected rate of return on a risky asset.[1] For any asset ("j"), the expected rate of return is

[1] For detailed discussions of the firm's cost of capital, see Ehrhardt (1994) and Pratt (1998). [2] For example, see Merton (1980), Mayfield (1999), and Welch (2000).

$$Rj = Rf + Bj(Rm-Rf), \quad \text{... (1)}$$

which is the sum of the rate of return on a risk-free asset, Rf, and a "risk premium; Bj(Rm - Rf). The risk premium represents the additional return that the marginal investor requires as compensation for holding the asset and taking on additional risk.

The risk of the asset is measured by its "beta" (Bj), which reflects the correlation between the value of the asset and the value of a portfolio consisting of all risky assets ("the market"). Beta represents risk that cannot be diversified away. An asset with a beta of 1.0 has the same risk as the market. In practice, the beta of an asset is estimated as the slope of the statistical regression line showing the "best fit" relationship between historical rates of return on the asset and on the market.

The term (Rm - Rf) represents the "market risk premium," or the amount by which the market is expected to outperform the risk-free asset. In practice, Rm is approximated by the return on a broad stock market index like the S&P 500, and Rf is measured as the promised return on a long-term U.S. government bond. The market risk premium has historically been about 7.5%, on average, although academic estimates of the *ex ante* premium range from 0.5% to 12%.[2]

The CAPM can be used to calculate appropriate discount rates for both financial and non-financial assets. In the case of non-financial assets, which often are not traded or are traded only infrequently, the price data needed to estimate betas might not exist. In the APV and CCF discounted cash flow methods described below, it is necessary to know the beta of the firm's physical assets, which usually are not actively traded. However, the asset beta (Ba) can be estimated indirectly by exploiting the relationship:

$$Ba = (D/V)*Bd + (E/V)*Be, \quad \text{... (2)}$$

where D and E denote the market value of the firm's debt and equity, respectively, and V denotes the firm's enterprise value (=D+E). Ba can therefore be estimated once one has estimates of the firm's debt and equity betas, Bd and Be.

In practice, to simplify the calculations, it is often assumed that Bd equals zero. In some types of reorganization, however, this assumption may be unwarranted. For example, companies that emerge from bankruptcy reorganization typically have higher than normal amounts of leverage (see Gilson (1997)). In these cases, it may be more sensible to assume a positive value for Bd. In this regard, one reasonable value for Ed is 0.25, the estimated beta for risky high yield bonds (see Cornell
and Green (1991)).

2.2.3. The Adjusted Present Value (APV) Method [2]

In the *APV* method, total cash flows to capital are allocated to three "buckets," and a separate discount rate is used to estimate the present value represented by each bucket. The three buckets are (1) cash flows generated by the business, (2) cash flows from using interest tax shields, and (3) cash flows from using NOL carryforwards. This partitioning of cash flows is illustrated in Exhibit 1.

To calculate cash flows generated by the business, represented bv the first bucket, one estimates

[2] This method is also described in Grinblatt and Titman (1998).

earnings-before-interest-and-after-taxes *(EBIAT),* and then makes various adjustments for all business-related sources and uses of cash (summarized by the term *CFA). EBIAT* represents what the firm's accounting earnings hypothetically would be if it had no debt, and therefore had no interest expense. *CFA* includes an add-back for noncash charges like depreciation or amortization, a deduction for cash expenditures on new capital equipment and net working capital, and credit for cash proceeds from asset sales or any excess cash that the firm holds.[3] Under the *APV* method, these cash flows are discounted at the expected rate of return on the firm's assets, Ra, which reflects the inherent risk of these cash flows.

(Note that in calculating business-related cash flows, one does not want to deduct interest expense because cash flows to capital represent the sum total of all cash flows available to both stockholders *and* creditors.)

The second bucket of cash includes the tax savings from deducting interest expense. In any year, these savings are equal to annual interest expense ("I" in Exhibit 1) multiplied by the marginal corporate tax rate (t). If the tax rate is fixed, then any variation in these cash flows over time must be due to changes in interest expense. Thus under the *APV* method these cash flows are discounted at the expected rate of return on the firm's debt, Rd, which captures the risk inherent in the firm's interest expense.

The third bucket of cash includes the tax savings from using NOLs. For companies that have to restructure because of poor operating performance, NOLs can be very large, and a potentially important source of value.[4] Tax rules in the U.S. and many other countries impose limits on how much of a company's NOLs can be used to shield income in a given year, *however.* In the U.S., Section 382 of the Internal Revenue Code imposes a severe annual cap on NOLs in companies that experience a significant change in their equity ownership; in extreme circumstances the NOLs can be eliminated altogether (see Gilson (1997)).

The annual impact on cash flows is equal to the amount of NOLs used to shield taxable income ("N" in Exhibit 1), multiplied by the marginal corporate tax rate (t). Until the company's NOLs are exhausted, the amount of NOLs that it uses in any year will equal the lesser of (1) its taxable income, and (2) the statutory annual limit on NOL usage. Companies will often design a reorganization to avoid running up against the statutory limit. Therefore, unless this limit has been triggered, cash flows from using NOLs will be directly correlated with the firm's taxable income. Since taxable income is received by the firm's stockholders, it is therefore appropriate to discount these cash flows using the expected rate of return on the firm's equity, Re. (If the statutory limit has been Triggered, however, then a lower discount rate is warranted.)

Exhibit 2 presents a specific example of a valuation using the APV method. The example features a company that has provided financial projections for the next five years. Such detailed projections are almost always issued publicly when a company reorganizes under Chapter 11 of the U.S. Bankruptcy Code.[5] Much less information is generally disclosed in other kinds of

[3] Excess cash is literally cash that the firm does not need to conduct its business. Thus it should be possible to pay the excess cash to creditors or shareholders without affecting in any *way* the firm's future revenues, expenses, and profitability.

[4] For example, for a sample of firms that emerged from Chapter 11 bankruptcy, Gilson (1997) reports that NOLs were equal to 243% of the book value of assets for the median sample company.

[5] *By law, the company is required to publish financial projections, and an estimate of its enterprise value, in a "disclosure statement," which presents the reorganization plan to creditors. Most companies' projections cover at least four years, with 4-5 years being typical (see Gilson, Hotchkiss, and Ruback (2000)).*

reorganizations, such as corporate equity spin-offs or downsizing programs (although financial analysts may publish their own financial projections). In corporate mergers, the bidder and target companies' investment banking advisors typically produce internal financial projections with the help of management.

In panel A, cash flows generated by the business ("free cash flows") are shown on line 15. Assuming the firm will continue to operate after year 5, the value of free cash flows expected after the projection period must also be estimated. This "terminal value" is calculated using the formula for a growth perpetuity, assuming that free cash flows after year 5 will grow an a constant annual 3% rate. (line 16). This terminal value, and free cash flow in years 1-5, is then discounted at the expected rate of return on assets, assumed to be 12%. The total present value of *free* cash flows is therefore 615.3
(lines 17-19).

Notice that the terminal value contributes disproportionately to the total present value, accounting for 84% (=515.0/615.3) of the total. This is a fairly common situation for firms that are emerging from bankruptcy (Gilson, Hotchkiss, and Ruback (2000)). Although the bankruptcy may have allowed the firm to repair its capital structure, additional time-possibly several years-may be required to turn around its operations. Thus the free cash flows for such a company may be relatively "back end loaded." Given the formula for the present value of a growth perpetuity,

Terminal year cash flow x (1+g)/(Ra-g), ... (3)

relatively small changes in the assumed growth rate, g, can have a very large impact on estimated enterprise value.

Panel B of Exhibit 2 shows the present value of cash flows from interest tax shields. This example assumes that the firm's debt stays at a constant level of 300 over time. (The implications of allowing debt to change are considered in the next exhibit.) At a discount rate of 8% (the expected rate of return on the debt, Rd) these interest tax shields have a present value of 102 (line 26).

Finally, panel C shows the present value of the cash flows from using NOLs. The calculation assumes there is no statutory limit on using the NOLs. Because the NOLs run out before the end of the projection period, it is not necessary to calculate a terminal value for them. Discounted at the expected rate of return on equity, Re, the NOL tax shield has a present value of 31.4.[6]

Total enterprise value assuming constant debt is therefore 748.7 (panel D).

Exhibit 3 illustrates how the APV method can easily accommodate a changing debt level. The financial projections and assumptions are identical to those in Exhibit 2, except it is now assumed that the company uses all available cash flows to pay down its debt through year 5, after which debt is maintained at a constant level. Panel A derives the company's new debt

[6] *This calculation is complicated by the fact that future changes in the company's enterprise value will cause its leverage ratio to change (even though the dollar level of debt is fixed), thereby changing Be and thus Re (see equation 2 above). In the Exhibit 2 calculations, enterprise value is reestimated annually, allowing Be and Re to be updated each year during the projection period until the NOLs expire. In practice, the impact of omitting this adjustment is probably second-order for most companies.*

level for vears 1-5. Since free cash flows generated by the business are calculated before deducting interest expense, the first bucket of cash flows is unchanged from the previous example. The present value of interest tax shields is now lower, however, due to the lower debt level (from panel B, interest tax shields are now only worth 76.4, compared to 102 before). On the other hand, the present value of the NOL tax shield is now somewhat higher (31.5 from panel C versus 31.4 before) since the reduction in interest in interest expense leads to higher taxable income, so the NOLs are used up more quickly. Overall, the firm's enterprise value falls to 723.2, from 748.7 under the constant debt assumption.

2.2.4. The Capital Cash Flow (CCF) Method [7]

The CCF method recognizes the same three buckets of value as the APV method, but the different sources of cash flow are consolidated, and a single discount rate-the expected rate of return on the firm's assets, Ra-is used to calculate the present value of the cash flows. As illustrated in Exhibit 1, there are several alternative versions of the CCF method, but they differ only in the computational steps taken to calculate cash flows. Total cash flows are the same in each case. Moreover, total cash flows under the CCF method arc identical to total cash flows under the APV method.

To justify using the rate Ra to discount interest tax shields, the CCF method assumes that the firm maintains its leverage ratio (D/V) at some constant level over time (see Ruback (2000)). If the firm continuously issues or repays debt to keep D/ V unchanged whenever V changes, then variation in D over time (and variation in interest expense) is entirely driven by changes in V. Thus the riskiness of the interest tax shield is appropriately captured by the expected rate of return on the firm's assets.

Which valuation method one chooses-CCF or APV-should depend on what assumption is being made about the firm's debt policy. Using the CCF method referable when the firm has a stable long-run target leverage ratio. However, if large changes in the leverage ratio are planned in the short- to medium-term, the APV method, or some combination of the two approaches, may be preferable.

The CCF method is also preferable when the firm's effective tax rate differs materially from the statutory marginal rate (e.g., due to tax credits or foreign tax payments). Under the APV method, the firm's tax payments have to be estimated using the statutory rate ("t" in Exhibit 1). If this rate is inappropriate, under the CCF method one can simply begin with reported net income, which reflects actual taxes paid.

Exhibit 4 shows how the CCF method can be used to estimate enterprise value using the example from the previous exhibit. The firm is again assumed to use all available cash flow to pay down its debt until year 5. After that it is assumed to grow the debt at the same rate as total cash flows to capital, and thus total enterprise value, consistent with the assumption of a constant leverage ratio. The exhibit shows how two versions of the CCF method yield exactly the same estimate of
enterprise value, 711.1 (lines 12 and 25).[8]

[7] *This method is developed and explained in Ruback (2000). For applications of this method, see Kaplan and Ruback (1995) and Gilson, Hotchkiss, and Ruback (2000).*

This estimate is lower than the estimate of 732.2 reported in Exhibit 5 using the AFV method. In general the two methods always produce different valuations because the make *different* assumptions about discount rates and possibly the firm's debt policy, although in practice the difference in valuations is usually modest. In general, the CCF method places a higher value on NOL tax shields because it discounts them at a lower rate (Ra instead of Re), but it places a lower value on interest tax shields because it discounts them at a higher rate (Ra instead of Rd). In the current example, the APV valuation assumes that debt remains constant in dollar terms after year 5, while the CCF valuation assumes that debt grows at 3% a year, thereby producing larger dollar interest deductions after year 5. However, the higher discount rate used to value the interest tax shields under the CCF method (12% instead of 8%) more than offsets the larger dollar tax savings from interest in this case.

2.2.5. The Weighted Average Cost of Capital (WACC) Method

The WACC method is perhaps the most widely taught and used approach for valuing cash flows, however it is often inappropriate for valuing companies that are being restructured. As shown in Exhibit 1, the definition of cash flows under this method excludes the tax savings from deducting interest expense. The present value of these tax savings is captured indirectly, however, by discounting remaining cash flows by a single rate the weighted average cost of capital-which includes an adjustment for the tax deductibility of interest:

WACC = (D/V) x Rd x (1-t) + (E/V) x Re.

But for the term (1-t), this discount rate is equivalent to the expected rate of return on the firm's assets (Ra), used to discount cash flows under the CCF method. The WACC method assigns full value for the interest tax shields by using a discount rate that reflects the after-tax cost of debt finance. By discounting cash flows at this lower rate, this method "inflates" the firm's estimated value by exactly the present value of the interest tax shields.

The WACC discount rate depends on the firm's leverage ratio (D/V), however. If this ratio changes over time, then the discount rate must be continually recalculated, which can be extremely cumbersome. In practice, leverage often changes dramatically after a company is restructured. For example, most companies that take on significant debt in a leveraged buyout or leveraged recapitalization subsequently pay down the debt. The independent companies that are created by a corporate spin-off may not start out with optimal capital structures, necessitating the subsequent issuance or retirement of debt. And financially distressed companies that reorganize in bankruptcy or restructure their debt out of court may initially retain too much debt for tax or other reasons (Gilson (1997)), and contemplate a follow-up reorganization or equity issuance.

[8] *This would not necessarily happen if the firm's effective tax rate differed from the statutory marginal rate, since the EBIT version of the model (panel B) assumes that the firm pays taxes at the statutory rate.*

2.2.6. Market Value Multiples

Using market value multiples to value a company, one assumes that the capital market values each dollar of annual profit earned by the company the same as it values the annual profits of other similar companies (i.e., companies that make the same products, use the same technology, have the same cost structure, face the same business risks, etc.). The capital market's valuation can either be determined by reference to the trading value of other firms' debt and equity securities (the "comparable companies" approach), or by reference to the amounts paid for such companies in corporate acquisitions (the "comparable transactions" approach). In either case, the accuracy of the valuation depends on how closely these other companies match the company being valued.

Exhibit 5 illustrates how the comparable companies approach can be used to value a firm. The firm, Allied Industries, has issued forecasts of EBIT for the next five years. Companies A, B, and C are considered comparable to Allied. All three companies are publicly traded, so the enterprise value of each company simply equals the market value of its debt and equity (D+E=V).[9] A market value multiple is calculated for each company, relative to some year's projected EBIT (in this example, year I EBIT).[10] For Company A, for example, the ratio of enterprise value to year 1 EBIT is 9.8. To estimate the enterprise value of Allied Industries, the average market value multiple (12.9) is multiplied bv Allied's projected year 1 EBIT (32.0), yielding an estimated value of 412.8.

To check the robustness of this estimate, the analysis could be repeated using a different definition of profits, e.g., EBITDA or EBIAT. If profits in the industry are generally negative, it is also possible to compare enterprise values to revenues or some other (positive) measure of activity.

Although this approach is relatively easy, it can produce upward- or downward-biased estimates of enterprise value for companies that have recently completed, or are considering, some kind of reorganization.

One potential problem in using the comparable companies approach arises when the firm is in the early stages of an operating turnaround. Such a firm may have significant future growth potential, and profitable growth should be positively valued in the capital market. However, if the comparable companies are operating in "steady state," the value of such growth will not be reflected in their market values, producing a downward-biased market multiple. This situation is illustrated in Exhibit 5. Allied Industries is forecasting compound annual EBIT growth of 38.5% over the next five years. Corresponding EBIT growth for the three comparable companies, however, ranges from only 9.8 to 16.3. In the example, Allied's estimated enterprise value using the CCF discounted cash flow method is 711.1, so the market multiple approach undervalues the firm by 298.3. Valuation consultants will sometimes try to compensate for this problem by using the market value multiple to value projected profits in some later year, after the turnaround has occurred, but this adjustment is ad hoc.

Another potential problem with using market multiples to value a company in need of reorganization arises when the company’s entire industry is financially troubled. In this case

[9] *If some of the debt is not publicly traded, for example a bank loan, it is standard practice to substitute the face value of the debt.*
[10] *If no projections are available, EBIT for the year just ended can be used instead.*

there may be no external benchmark to which the company can refer to gauge how it will be valued once its financial difficulties are over.

Finally, using comparable transactions multiples to estimate a company's value may be problematic if the company has just completed a reorganization, and it used the reorganization to reduce its costs (e.g., through employee layoffs). The price paid in most acquisitions generally includes a premium above the acquired entity's pre-acquisition market value. One reason the acquirer can afford to pay this premium is that it plans to lay off workers or otherwise cut costs in the acquired company after it takes control.

Exhibit 1 Comparison of Alternative Discounted Cash Flow Valuation Methods

Definitions of symbols:

R Revenues

C Cost of goods sold and selling, general, and administrative expenses
D Depreciation
I Interest expense
N Taxable income shielded by net operating loss carryforwards
t Marginal corporate tax rate

CFA (cash flow adjustments)
Depreciation
- Capital expenditures
- Investment in net working capital
+ + Excess cash
+ Proceeds from asset sales

VALUATION METHOD	**CALCULATION OF CASH FLOWS**
Adjusted Present Value Method	$\underbrace{(R- C - D) \times (1-t)}_{\text{EBIAT}} + CFA + \underbrace{I \times t}_{\text{Interest tax shield}} + \underbrace{N \times t}_{\text{NOL tax shield}}$
Capital Cash Flow Method A. Net Income Version	$\underbrace{(R-C-D-I)x(1-t) + N \times t}_{\text{Net Income}} + CFA + I$
B. EBIT Version	$\underbrace{(R-C-D)}_{\text{EBIT}} - \underbrace{(R - C - D - I - N) \times t}_{\text{Taxes Payable}} + CFA$
C. EBITDA Version	$\underbrace{(R-C)}_{\text{EBITDA}} - \underbrace{(R - C - D - I - N) \times t}_{\text{Taxes Payable}} + CFA - D$
Weighted Average Cost of Capital (WACC) Method	$\underbrace{(R-C-D) \times (1-t)}_{\text{EBIAT}} + \underbrace{N \times t}_{\text{NOL tax shield}} + CFA$

Exhibit 2 Adjusted Present Value (APV) Method: Constant Debt Level

Note: Assume that the firm maintains its debt at a constant dollar level over time

Initial debt	300
Initial net operating loss carryforwards (NOLs)	140
Expected rate of return on debt (Rd)	8.0%
Expected rate of return on equity (Re), initial value [a]	14.8%
Asset beta (Be)	0.8
Long-term U.S. government bond rate (Rf)	6.0%
Market risk premium (Rm-Rf)	7.5%
Expected rate of return on assets (Re), where Re = Rf + Ba(Rm-Rf)	12.0%
Long-term annual growth rate (g)	3.0%
Marginal corporate tax rate	34.0%

Panel A Free cash flows generated by the business

Line #			Year 1	2	3	4	5
1	Revenues		800.0	860.0	925.0	950.0	1,020.0
2	Cost of goods sold		(720.0)	(774.0)	(786.3)	(807.5)	(816.0)
3	Selling, general and administrative expenses		(48.0)	(51.6)	(50.9)	(52.3)	(40.8)
4	EBIT		32.0	34.4	87.9	90.3	163.2
5	Interest expense		(24.0)	(24.0)	(24.0)	(24.0)	(24.0)
6	Profit before tax		8.0	10.4	63.9	66.3	139.2
7	Taxes (@34%)		(2.7)	(3.5)	(21.7)	(22.5)	(47.3)
8	Net income		5.3	6.9	42.2	43.7	91.9
9	EBIAT		21.1	22.7	58.0	59.6	107.7
10	+ Depreciation		90.0	93.0	98.0	105.0	112.0
11	-Capital expenditures		(95.0)	(96.0)	(105.0)	(115.0)	(120.0)
12	- Investment in net working capital		(16.0)	(17.2)	(18.5)	(19.0)	(20.4)
13	+ Excess cash		8.0	0.0	0.0	0.0	0.0
14	+ Proceeds from asset sales		3.0	1.0	0.0	0.0	0.0
15	Free cash *flows*		11.1	3.5	32.5	30.6	79.3
16	Terminal value [b]						907.7
17	Present value of year 1-5 cash flows	100.3					
18	Present value or terminal value	515.0					
19	Total present value (discounted at Re)	615.3					

[a] Based on the firm's initial enterprise value of 748.7. Over time, Re is expected to decline due to firecasted increases in the firm's enterprise value, which will reduce its financial leverage (= debt / enterprise value). In panel III, the present value of cash flows from using NOLs is calculated using a different estimate of Re each year, based on updated estimates of the firm's enterprise value and financial leverage. Re is estimated using the capital asset pricing model: Re = Rf + Be*(Rm-Rf). Be, the beta of the firm's equity, is derived from the relationship: Ba = (DN)*Bd + (EIV)*Be, where V denotes enterprise value, and Bd is assumed to equal 0.25 (see Comell and Green (1991)).

[b] Valued using the growth perpetuity formula: Terminal year cash flow* (1+g)/(Ra-g)

Exhibit 2 (continued) Adjusted Present Value (APV) Method: Constant Debt Level

Note: Assume that the firm maintains its debt at a constant dollar level over time.

Panel B. Cash flows from interest tax shields

Line #			Year 1	2	3	4	5
20	Debt		300.0	300.0	300.0	300.0	300.0
21	Interest expense		24.0	24.0	24.0	24.0	24.0
22	Tax savings (@34% tax rate)		8.2	8.2	8.2	8.2	8.2
23	Terminal value'						102.0
24	Present value of year 1-5 cash flows	32.6					
25	Present value of terminal value	69.4					
26	***Total present value (discounted at Rd)***	***102.0***					

[a] Valued using simple perpetuity formula: Terminal year cash flow / Rd

Panel C. Cash flows from using net operating loss carryforwards (NOLs)

Line #			Year 1	2	3	4	5
27	Profit before tax		8.0	10.4	63.9	66.3	139.2
28	NOLs used		8.0	10.4	63.9	57.7	0.0
29	Cumulative NOLs used		8.0	18.4	82.3	140.0	140.0
30	Reduction in taxes paid'		2.7	3.5	21.7	19.6	0.0
31	***Total present value* (discounted *at Re)***	***31.4***					

[a] Equals NOLs used each year x the marginal corporate tax rate (34%)

Panel D. Total enterprise value

Source of cash flow	*Present value*
Free cash flows generated by the business	615.3
Cash flows from interest tax shields	102.0
Cash flows from using net operating loss carryforwards (NOLs)	31.4
Total	***748.7***

Exhibit 3 Adjusted Present Value (APV) Method: Declining Debt Level

Note: Assume that the firm uses all available net cash flows (free cash flows after tax expense) to *pay* down de each year through year 5, then maintains debt at a constant level thereafter.

Initial debt	300
Initial net operating loss carryforwards (NOLs)	140
Expected rate of return on debt (Rd)	8.0%
Expected *rate of return on equity (Re), initial value* [a]	14.8%
Asset beta (Ba)	0.8
Long-term U.S. government bond rate (Rf)	6.0%
Market risk premium (Rm-Rf)	7.5%
Expected rate of return on assets (Ra), where Ra = Rf + Ba(Rm-Rf)	12.0%
Long-term annual growth rate (g)	3.0%
Marginal corporate tax rate	34.0%

Panel A. Pro forma debt projection

		Year				
Line #		1	2	3	4	5
1	EBIT	32.0	34.4	87.9	90.3	163.2
2	Interest expense	(24.1)	(24.5)	(23.4)	(20.3)	(16.1)
3	Profit before tax	7.9	9.9	64.5	69.9	147.1
4	Taxes (034%) °	0.0	0.0	0.0	(4.2)	(50.0)
5	Net income	7.9	9.9	64.5	65.8	97.1
6	+ Depreciation	90.0	93.0	98.0	105.0	112.0
7	- Capital expenditures	(95.0)	(96.0)	(105.0)	(115.0)	(120.0)
8	- Investment in net working capital	(16.0)	(17.2)	(18.5)	(19.0)	(20.4)
9	+ Excess cash	8.0	0.0	0.0	0.0	0.0
10	+ Proceeds from asset sales	3.0	1.0	0.0	0.0	0.0
11	Net cash flow	(2.1)	(9.3)	39.0	36.8	68.7
12	Beginning of year debt	300.0	302.1	311.4	272.4	235.6
13	End of year debt	302.1	311.4	272.4	235.6	166.9

[a] *Based on the firm's initial enterprise value of 723.2. Over time, Re is expected to decline due to forecasted increases in the*
firms enterprise value and forecasted reduction in its debt, which will reduce its financial leverage (= debt / enterprise value). In panel III, the present value of cash flows from using NOLs is calculated using a different estimate of Re each year, based on updated estimates of the fir's enterprise value and financial leverage. Re is estimated using the capital asset pricing model: Re = Rf + Be*(Rm-Rf). Be, the beta of the firm's equity, is derived from the relationship: Be = (DN)*Bd + (E/V)*Be, where V denotes enterprise value, and Bd is assumed to equal 0.25 (see Comell and Green (1991)).

Reflects utilization of net operating loss carryforwards (NOLs)

2.4. Valuation of intangible assets

Whether an asset is tangible or intangible, it should be subject to the rights of property. For an intangible asset to qualify as property it should enjoy all the legal rights, benefits, and privileges of property. It should be subject to identification, legal existence and protection, right of private ownership that is legally transferable, have evidence of its existence, have been created at an identifiable time, and be subject to being destroyed. In order to have economic value the intangible asset should generate some measurable amount of economic benefit to its owner and enhance the value of the other assets with which it is associated.

Intellectual properties are intangible assets that enjoy special legal recognition and legal protection. Generally categorized as (1) creative (trademarks, copyrights, computer software) or as (2) innovative (patents, industrial designs, trade secrets). Most intellectual properties have a specified legal life and external commercialization opportunities. More transactional data are available for intellectual properties and they enjoy higher royalty rates than other intangible assets.

We could define intangible assets as all the elements of a business enterprise that exist in addition to monetary (working capital) and tangible assets (fixed assets). Their existence is dependent on the presence, or expectation, of earnings. They typically appear last in the development of a business and disappear first in its demise. Intangible assets may be categorized as follows:

1. Rights – such as contracts to receive goods and services at an advantageous price, franchises, contracts to sell goods and services profitably.
2. Relationships – such as assembled workforce, customer relationships, distributor relationships
3. Grouped Intangibles – such as going concern value, goodwill.
4. Intellectual Property – patents, trademarks, copyrights, and trade secrets or know-how.

Accounting Treatment of Intangible Assets

Paragraphs 9 through 17 of SFAS 142 prescribe the appropriate accounting treatment for intangible assets other than goodwill. Intangible assets are broadly defined as non-financial assets that lack physical substance. An understanding of the accounting for intangible assets, and the related implications for companies' reported earnings, is facilitated by reference to four categories of intangible assets.

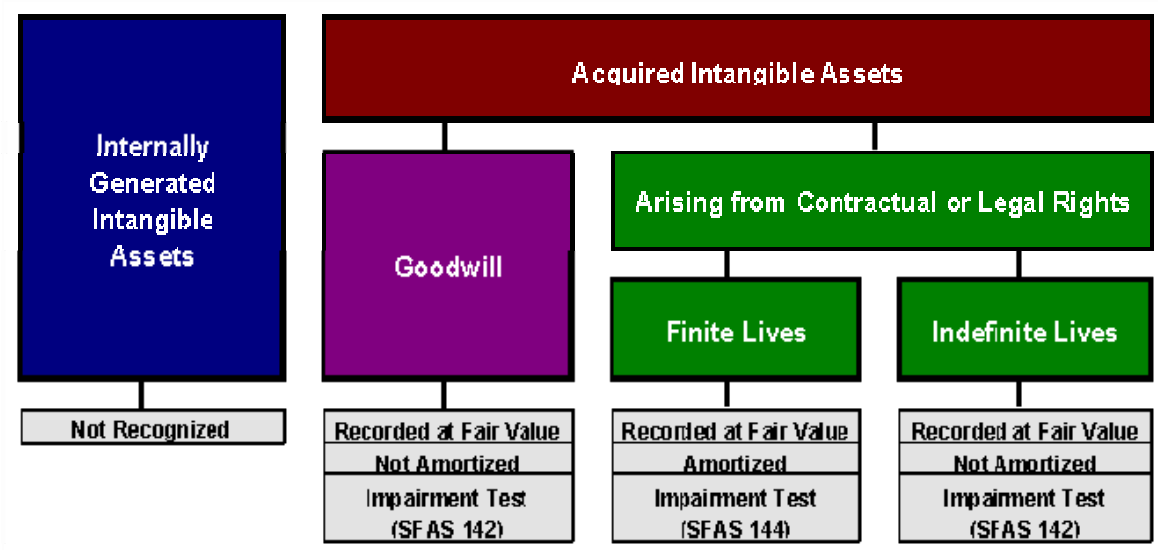

Figure 1

As Figure 1 illustrates, intangible assets developed within the reporting company are not recognized on the company's balance sheet, whereas intangible assets acquired from other businesses (or via a business combination) are considered to meet the definition of an asset. Paragraph 39 of SFAS 141 requires that acquired intangible assets be recognized separately from goodwill if the intangible asset "arises from contractual or other legal rights." As the graphic below illustrates, whether the intangible asset in question is separable from the acquired entity must also be assessed in determining whether the asset should be recognized separately from goodwill. Separability, which is demonstrated by the ability to sell, transfer, license, rent, or exchange the asset, triggers separate recognition regardless of whether the contractual or other legal rights test is met.

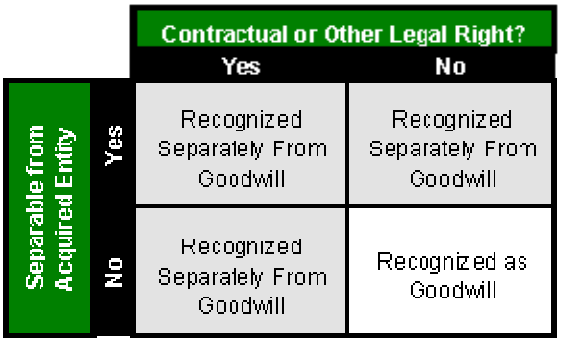

Figure 2

In Appendix A to SFAS 141, the FASB provides examples of assets that meet the criteria for recognition separately from goodwill. The specific assets listed are assigned to five distinct categories:

- Marketing-related intangible assets such as trademarks and internet domain names
- Customer-related intangible assets such as customer lists and order backlogs

- Artistic-related intangible assets such as literary and musical works
- Contract-based intangible assets such as licensing, lease, and franchise agreements
- Technology-based intangible assets such as technology (both patented and unpatented) and computer software

The motivation of acquirers to pay a premium to the fair value of net tangible assets is frequently traced to the control of one or more of these intangible assets. The specific recognition of these assets on the company's balance sheet will require the determination of the fair value of these assets.

The unique nature of intangible assets frequently requires reliance on different benchmarks and data sources than those used in traditional business valuation. Consultation with qualified business valuation professionals experienced in the valuation of intangible assets will likely be considered necessary by reporting companies and their independent auditors.

Finally, intangible assets recognized separately from goodwill must be classified as having either finite or indefinite useful lives. Those intangible assets deemed to have finite useful lives will be amortized over their estimated useful lives (and tested for impairment annually using the undiscounted cash flow test of SFAS 144), while intangible assets having indefinite lives will not be amortized until their useful lives are determined to become finite, at which time they will be amortized. Indefinite-lived intangible assets are to be tested for impairment by comparing their estimated fair values with their carrying values on the balance sheet.

Intangible Asset Valuation

The value of an intangible asset is a function of a stream of future benefits, discounted to the present. The difficulty arises in attaching specific benefits to specific intangible assets. A detailed discussion of intangible asset valuation is beyond the scope of this article. However, the following discussion presents an overview of the three basic valuation approaches (cost, income, and market) applied to intangible assets.

The Cost Approach

The cost approach seeks to measure the future benefits of ownership by quantifying the amount of money that would be required to replace the future service capability of the subject intellectual property. The assumption underlying the cost approach is that the cost to purchase or develop new property is commensurate with the economic value of the service that the property can provide during its life. The cost approach does not directly consider the amount of economic benefits that can be achieved nor the time period over which they might continue. It is an inherent assumption with this approach that economic benefits indeed exist and are of sufficient amount and duration to justify the developmental expenditures.

Income Approach

The income approach focuses on a consideration of the income producing capability of the subject intangible asset. The underlying theory is that the value of the subject property can be measured by the present worth of the net economic benefits to be received over the life of the intangible asset.

The Market Approach

The market approach provides an indication of value by comparing the price at which similar property has been exchanged between willing buyers and sellers. When the market approach is used, an indication of the value of a specific intangible asset can be gained from looking at the prices paid for comparable property. Requirements for the successful use of this approach include the existence of an active market involving comparable intangible assets, and, access to price information at which comparable intangible assets were exchanged.

Determining the Value of the Goodwill and patents

Since both goodwill and patents are intangible assets, their values will be whatever negotiators conclude. Still, their values need to be reflected in financial statements.

Goodwill is created in the aftermath of an acquisition, and must appear on a balance sheet. The acquisition of a patent has a cost of its own, be it the price of internal development costs, or the purchase price paid to an inventor.

Practical considerations

Ultimately, the assigned values of both assets are matters of opinion, however learned the opinions may be. Each must be considered separately.

Ordinarily, goodwill is completely ignored by accountants. Only when a company has been acquired by another does goodwill become an intangible asset. It then appears on a balance sheet in the amount by which the price paid by the acquiring company exceeds the net tangible assets of the acquired company. In other words:

Purchase price - net assets = goodwill

If, for example, an airline is bought for $12 billion and its net assets are valued at $9 billion, $3 billion of the purchase would be allocated to goodwill on the balance sheet.

The buyer will attribute the difference to any number of reasons that give a competitive advantage, such as a loyal and long-standing customer base, a strong brand, strategic location, or productive employees.

A patent's value, meanwhile, will probably be the sum of its development costs, or its purchase price if acquired from someone else. It is usually to a company's advantage to spread the patent's value over several years. If so, the critical time period to consider is not the full life of the patent (17 years in the United States), but its estimated useful life.

For example, let's say that in January 2000 a company acquired a patent issued in January 1995 at a cost of $100,000. It concludes that the patent's useful commercial life is 10 years, not the 12 remaining before the patent expires. In turn, patent value would be $100,000, and it would be spread (or amortized in accounting terms) over 10 years, or $10,000 each year.

It is important to know that:

- Accounting for goodwill can vary by country, an issue to be considered when evaluating or negotiating acquisitions of foreign-based companies. Moreover, the rules may change from time to time. In the United States, for example, goodwill no longer has to be amortized over 40 years.
- The total value of a patent's development costs may stretch over several years.
- The cost of a patent ultimately may have little bearing on the future revenues and profits it brings.

Quick reference information on applicability of valuation methods in certain situations is presented in Appendix 1.

Conclusion

Intangible asset valuation theoretically parallels securities valuation; i.e., value is based upon a stream of future benefits discounted to the present. The primary complicating factor for intangible asset valuation is relating specific benefits and costs to specific intangible assets or, stated differently, separating and valuing the intangible asset apart from the larger entity.

Because of the inherently unique nature of many intangible assets, finding transactions involving comparable assets can be difficult. Also, valuing a specific entity or reporting unit could be thought of as the valuation of a portfolio encompassing numerous assets representing different life cycle stages, varying degrees of market potential, and dissimilar current and expected future contribution to entity value. However, the valuation of a single intangible asset necessarily requires a more exact specification of life cycle stage, market potential, future contribution, etc. The considerations can be quite difficult, particularly for assets with relatively undeveloped markets.

3. DATA GATHERING

The data gathering is a major activity conducted by the appraiser. The outcomes of the appraisal are predetermined by the entirety and quality of the collected information. It is important that the information should be verified in regard to its reliability and validity at the time when it has been gathered. The basic sources of information are the company Financial Statements. Additionally depending on the selected valuation methods specific sources of information as statistical and other market data on comparative sales, discount rates should be gathered from relative information sources. Description of the basic information resources is given below.

3.1. Sources of basic information (BS,IS, CFS, other)

3.1.1. Profit and Loss account

What It Measures

A company's sales revenues and expenses over a period, providing a calculation of profits or losses during that time.

Why It Is Important

Reading a P&L is the easiest way to tell if a business has made a profit or a loss during a given month or year. The most important figure it contains is net profit: what is left over after revenues are used to pay expenses and taxes.

Companies typically issue P&L reports monthly. It is customary for the reports to include year-to-date figures, as well as corresponding year-earlier figures to allow for comparisons and analysis.

How It Works in Practice

A P&L adheres to a simple rule of thumb: "revenue minus cost equals profit."

There are two P&L formats, multiple-step and single-step. Both follow a standard set of rules known as Generally Accepted Accounting Principles (GAAP). These rules generally adhere to requirements established by governments to track receipts, expenses, and profits for tax purposes. They also allow the financial reports of two different companies to be compared. Note that in the United Kingdom and several other nations, sales, revenues, and receipts may all be designated as turnover.

The multiple-step format is much more common, because it includes a larger number of details and is thus more useful. It deducts costs from revenues in a series of steps, allowing for closer analysis. Revenues appear first, then expenses, each in as much detail as management desires. Sales may be broken down by product line or location, while expenses such as salaries may be broken down into base salaries and commissions.

Expenses are then subtracted from revenues to show profit (or loss). A basic multiple-step P&L looks like this:

MULTIPLE-STEP PROFIT & LOSS ACCOUNT ($)			
NET SALES			750,000
Less: cost of goods sold			450,000
Gross profit			300,000
LESS: OPERATING EXPENSES			
Selling expenses			
Salaries & commissions	54,000		
Advertising	37,500		
Delivery/transportation	12,000		
Depreciation/store equipment	7,500		
Other selling expenses	5,000		
Total selling expenses		116,000	
General & administrative expenses			
Administrative/office salaries	74,000		
Utilities	2,500		
Depreciation/structure	2,400		
Misc. other expenses	3,100		
Total general & admin expenses		82,000	
Total operating expenses			198,000
OPERATING INCOME			102,000
LESS (ADD): NONOPERATING ITEMS			
Interest expenses	11,000		
Interest income earned	(2,800)		8,200
Income before taxes			93,800
Income taxes			32,360
Net Income			*61,440*

P&Ls of public companies may also report income on the basis of earnings per share. For example, if the company issuing this statement had 12,000 shares outstanding, earnings per share would be $5.12, that is, $61,440 divided by 12,000 shares.

Other Practical Considerations

- A P&L does not show how a business earned or spent its money.
- One month's P&L can be misleading, especially if a business generates a majority of its receipts in particular months. A retail establishment, for example, usually generates a large percentage of its sales in the final three months of the year, while a consulting service might generate the lion's share of its revenues in as few as two months, and no revenues at all in some other months.
- Invariably, figures for both revenues and expenses reflect the judgments of the companies reporting them. Accounting methods can be quite arbitrary when it comes to such factors as depreciation expenses.

3.1.2. Balance Sheet

What It Measures

The financial standing, or even the net worth or owners' equity, of a company at a given point in time, typically at the end of a calendar or fiscal year.

Why It Is Important

The balance sheet shows what is owned (assets), what is owed (liabilities), and what is left (owners' equity). It provides a concise snapshot of a company's financial position.

How It Works in Practice

However they are presented, assets must be in balance with liabilities and shareholders' equity. In other words, assets must equal liabilities and owners' equity.

Assets include cash in hand and cash anticipated (receivables), inventories of supplies and materials, properties, facilities, equipment, and whatever else the company uses to conduct business. Assets also need to reflect depreciation in the value of equipment such as machinery that has a limited expected useful life.

Liabilities include pending payments to suppliers and creditors, outstanding current and long-term debts, taxes, interest payments, and other unpaid expenses that the company has incurred.

Subtracting the value of aggregate liabilities from the value of aggregate assets reveals the value of owners' equity. Ideally, it should be positive. Owners' equity consists of capital invested by owners over the years and profits (net income) or internally generated capital, which is referred to as "retained earnings"; these are funds to be used in future operations.

As an example:

ASSETS $	
Current:	
Cash	8,200
Securities	5,000
Receivables	4,500
Inventory & supplies	6,300
Fixed:	
Land	10,000
Structures	90,000
Equipment (less depreciation)	
Intangibles/other	
TOTAL ASSETS	129,000
LIABILITIES $	
Payables	7,000
Taxes	4,000
Misc.	3,000
Bonds & notes	25,000
TOTAL LIABILITIES	39,000
SHAREHOLDERS' EQUITY (stock, par value × shares outstanding)	80,000
RETAINED EARNINGS	10,000
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	129,000

Other Practical Considerations

- The balance sheet does not show a company's market worth, nor important intangibles such as the knowledge and talents of individual people, nor other vital business factors such as customers or market share.
- The balance sheet does not express the true value of some fixed assets. A six-year-old manufacturing plant, for example, is listed at its original cost, even though the price of replacing it could be much higher or substantially lower (because of new technology that might be less expensive or vastly more efficient).
- The balance sheet is not an indicator of past or future performance or trends that affect performance. It needs to be studied along with two other key reports: the income statement and the cash flow statement. A published balance sheet needs to include prior period comparatives.

3.1.3. Cash flow Statement

What It Measures

Cash inflows and cash outflows over a specific period of time, typically a year.

Why It Is Important

Cash flow is a key indicator of financial health, and it demonstrates to investors, creditors, and other core constituencies a company's ability to meet obligations, finance opportunities, and generally "come up with the cash" as needs arise. Cash flow that is wildly inconsistent with, say, net income, often indicates operating or managerial problems.

How It Works in Practice

In its basic form, a cash flow statement will probably be familiar to anyone who has been a member of a club that collected and spent money. It reports funds on hand at the beginning of a given period, funds received, funds spent, and funds remaining at the end of the period.

That formula still applies to a business today, even if creating a cash flow document is significantly more complex. Cash flows are divided into three categories: cash from operations; cash-investment activities; and cash-financing activities. Companies with holdings in foreign currencies use a fourth classification: effects of changes in currency rates on cash.

A standard direct cash flow statement looks like this:

CRD, Inc.

Statement of Cash Flows

For year ended December 31, 20__

CASH FLOWS FROM OPERATIONS	
$	
Operating Profit	82,000
Adjustments to net earnings	
Depreciation	17,000
Accounts receivable	(20,000)
Accounts payable	12,000
Inventory	(8,000)
Other adjustments to earnings	4,000
Net cash flow from operations	*87,000*
CASH FLOWS FROM INVESTMENT ACTIVITIES	
Purchases of marketable securities	(58,000)
Receipts from sales of marketable securities	45,000
Loans made to borrowers	(16,000)
Collections on loans	11,000
Purchases of plant and real estate assets	(150,000)

Receipts from sales of plant and real estate assets	47,000
Net cash flow from investment activities:	*(-121,000)*
CASH FLOWS FROM FINANCING ACTIVITIES	
Proceeds from short-term borrowings	51,000
Payments to settle short-term debts	(61,000)
Proceeds from issuing bonds payable	100,000
Proceeds from issuing capital stock	80,000
Dividends paid	(64,000)
Net cash flow from financing activities	*106,000*
Net change in cash during period	72,000
Cash and cash equivalents, beginning of year	27,000
Cash and cash equivalents, end of year	*99,000*

Other Practical Considerations

- A cash flow statement does *not* measure net income, nor does it measure working capital.
- A cash flow statement does not include outstanding accounts receivable, but it does include the preceding year's accounts receivable (assuming these were collected during the year for which the statement is prepared).
- Add to a cash inflow any amounts charged off for depreciation, depletion, and amortization, since cash was actually spent.
- Cash equivalents are short-term, highly liquid investments, although precise definitions may vary slightly by country. These should be included when recalculating the movement of cash in the period.

There are alternative ways to present cash flow from operations. Some texts, for example, omit earnings and adjustments, and list instead cash and interest received, cash and interest paid, and taxes received.

3.1.4. Determining the cost of the goods sold

What It Measures

For a retailer, COGS is the cost of buying and acquiring the goods that it sells to its customers. For a service firm, COGS is the cost of the employee services it supplies. For a manufacturer, COGS is the cost of buying the raw materials and manufacturing its finished products.

Why It Is Important

Cost of goods sold may help a company determine the prices to charge for its products and services, and the volume of business that it needs to maintain in order to operate profitably.

For retailers especially, the cost of the merchandise sold is typically the largest expense, and thus an absolutely critical business factor. However, understanding COGS is an important success factor for any business because it can reveal opportunities to reduce costs and improve operations.

COGS is also a key figure on an income statement (also called the profit and loss account), and an important consideration in computing income taxes because of its close relationship to inventories, which taxation authorities treat as future income.

How It Works in Practice

Essentially, COGS is equal to a company's opening stock of goods and services, plus the cost of goods bought and direct costs incurred during a particular period, minus the closing stock of goods and services.

A critical consideration is the accounting policy that a company adopts to calculate inventory values, especially if raw materials prices change during the year. This may happen often, particularly when inflation is high. Inventory values under a First In First Out (FIFO) policy reflect original or older prices of materials, while a Last In First Out (LIFO) policy reflects current (and often more expensive) prices. Somebody computing COGS first needs to know which policy is being used, because this will affect inventory values.

COGS for a manufacturer will include a variety of items, such as raw materials and energy used in production, labor, benefits for production workers, the cost of raw materials in inventory, shipping fees, the cost of storing finished products, depreciation on production machinery used, and factory overhead expenses.

For a retail company such as Wal-Mart, COGS is generally less complex: the total amount paid to suppliers for the products being sold on its shelves.

COGS is calculated as follows:

Stocks at beginning of period	$20,000
Purchases during period	+ $60,000
Cost of good available for sale	= $80,000
Less inventory at period end	- $15,000
Cost of goods sold (COGS)	= $65,000

Because the counting of inventory is an exhaustive undertaking for retailers, doing it quarterly or monthly would be open to error. Accordingly, taxation authorities allow them to estimate cost of goods sold during the year.

Determining these estimates requires details of the gross profit margin (retailers typically use the preceding year's figure). This figure is then used to calculate the cost ratio.

Begin by assuming that net sales are 100%, then subtract the gross profit margin, say 40%, to produce a cost ratio of 60%: 100% Â— 40% = 60%. A monthly COGS calculation then looks like this:

Inventory at beginning of month	$10,000
Purchases during month	+ $25,000
Cost of goods available for sale	= $35,000
Less net sales during month	- $28,000
Cost ratio 100% - 40%	= 60%
Estimated cost of goods sold	= $16,800 ($28,000 x 60%)

There is one sample to review, because calculating COGS for manufacturers requires additional factors:

Inventory at beginning of year	$20,000
Purchases during year	+ $50,000
Cost of direct labor	+ $15,000
Materials and supplies	+ $12,000
Misc. Costs	+ $3,000
Total product expenses	= $100,000
Less inventory at year-end	- $15,000
Cost of goods sold (COGS)	= $85,000

Other Practical Considerations

- Anyone who wants to determine COGS must maintain inventories and know their value!
- Because goods returned affect inventory values and, in turn, cost of goods sold, returns of goods must be reflected in COGS calculations.
- Merchandising firms may use different inventory accounting systems, but the choice has no bearing on the actual costs incurred; it only affects allocation of costs.

COGS should not include indirect costs, which may include factors like administration and marketing costs, and other activities that cannot be directly attributed to producing or acquiring the product.

3.1.5. Depreciation schedules

Depreciation is a basic expense of doing business, reducing a company's earnings while increasing its cash flow. It affects three key financial statements: balance sheet; cash flow; and income (or profit and loss). It is based on two key facts: the purchase price of the items or property in question, and their "useful life."

Depreciation values and practices are governed by the tax laws of both national governments, and state or provincial governments, which must be monitored continuously for any changes that are made. Accounting bodies, too, have developed standard practices and procedures for conducting depreciation.

Depreciating a single asset is not difficult: the challenge lies in depreciating the many assets possessed by even small companies, and is intensified by the impact that depreciation has on income and cash flow statements, and on income tax returns. It is essential to depreciate with care and to rely on experts, ensuring that they fully understand the current government rules and regulations.

Frequently Asked Questions

1. What is depreciation?

It is an allocation of the cost of an asset over a period of time for accounting and tax purposes. Depreciation is charged against earnings, on the basis that the use of capital assets is a legitimate cost of doing business. Depreciation is also a noncash expense that is added into net income to determine cash flow in a given accounting period.

2. What is straight-line depreciation?

One of the two principal depreciation methods, it is based on the assumption that an asset loses an equal amount of its value each year of its useful life. Straight-line depreciation deducts an equal amount from a company's earnings throughout the life of the asset.

3. What is accelerated depreciation?

The other principal method of depreciation is based on the assumption that an asset loses a larger amount of its value in the early years of its useful life. Also known as the "declining-balance" method, it is used by accountants to reduce a company's tax bills as soon as possible, and is calculated on the basis of the same percentage rate each year of an asset's useful life. Accelerated depreciation also better reflects the economic value of the asset being depreciated, which tends to become increasingly less efficient and more costly to maintain as it grows older.

4. What can be depreciated?

To qualify for depreciation, assets must:

- be used in the business;
- be items that wear out, become obsolete, or lose value over time from natural causes or circumstances;
- have a useful life beyond a single tax year.

Examples include vehicles, machines and equipment, computers and office equipment and furnishings, and buildings, plus major additions or improvements to such assets. Some intangible assets also can be included under certain conditions.

5. What cannot be depreciated?

Land, personal assets, inventory, leased or rented property, and a company's employees.

How to determine depreciation

In order to determine the annual depreciation cost of assets, it is necessary first to know the initial cost of those assets, how many years they will retain some value for the business, and what value, if any, they will have at the end of their useful life.

For example, a company buys a truck to carry materials and finished goods. The vehicle loses value as soon as it is purchased, and then loses more with each year it is in service, until the cost of repairs exceeds its overall value. Measuring the loss in the value of the truck is depreciation.

Straight-line depreciation is the most straightforward method, and is still quite common. It assumes that the net cost of an asset should be written off in equal amounts over its life. The formula used is:

(Original cost - scrap value) / Useful life (years).

For example, if the truck cost $20,000 and can be expected to serve the business for seven years, its original cost would be divided by its useful life:

(30,000 - 2,000) / 7 = 4,000 per year.

The $4,000 becomes a depreciation expense that is reported on the company's year-end income statement under "operation expenses."

In theory, an asset should be depreciated over the actual number of years that it will be used, according to its actual drop in value each year. At the end of each year, all the depreciation claimed to date is subtracted from its cost in order to arrive at its "book value," which would equal its market value. At the end of its useful business life, any undepreciated portion would represent the salvage value for which it could be sold or scrapped.

For tax purposes, some accountants prefer to use accelerating depreciation to record larger amounts of depreciation in the asset's early years in order to reduce tax bills as soon as

possible. In contrast to the straight-line method, the declining-balance method assumes that the asset depreciates more in its earlier years of use. The table below compares the depreciation amounts that would be available, under these two methods, for a $1,000 asset that is expected to be used for five years and then sold for $100 in scrap.

	Straight-line Method		*Declining-balance Method*	
Year	*Annual Depreciation*	*Year-end Book Value*	*Annual Depreciation*	*Year-end Book Value*
1	$900 x 20% = $180	$1,000 - $180 = $820	$1,000 x 40% = $400	$1,000 - $400 = $600
2	$900 x 20% = $180	$820 - $180 = $640	$600 x 40% = $240	$600 - $240 = $360
3	$900 x 20% = $180	$640 - $180 = $460	$360 x 40% = $144	$360 - $144 = $216
4	$900 x 20% = $180	$460 - $180 = $280	$216 x 40% = $86.40	$216 - $86.40 = $129.60
5	$900 x 20% = $180	$280 - $180 = $100	$129.60 x 40% = $51.84	$129.60 - $51.84 = $77.76

While the straight-line method results in the same deduction each year, the declining-balance method produces larger deductions in the first years and far smaller deductions in the later years. One result of this system is that, if the equipment is expected to be sold for a higher value at some point in the middle of its life, the declining-balance method can produce a greater taxable gain in that year because the book value of the asset will be relatively lower.

The depreciation method to be used for a particular asset is fixed at the time that the asset is first placed in service. Whatever rules or tables are in effect for that year must be followed as long as the asset is owned.

Depreciation laws and regulations change frequently over the years as a result of government policy changes, so a company owning property over a long period may have to use several different depreciation methods.

Other Practical Considerations

- With rare exceptions, it is not possible to deduct in one year the entire cost of an asset if that asset has a useful life substantially beyond the tax year.
- To qualify for depreciation, an asset must be put into service. Simply purchasing it is not enough. There are rules that govern how much depreciation can be claimed on items put into service after a year has begun.
- It is common knowledge that if a company claims more depreciation than it is entitled to, it is liable for stiff penalties in a tax audit, just as the failure to properly allow for depreciation causes an overestimation of income. What is not commonly known is that if a company does not claim all the depreciation deductions it is entitled to, it will be considered as having claimed them when taxable gains or losses are eventually calculated on the sale or disposal of the asset in question.

- While leased property cannot be depreciated, the cost of making permanent improvements to leased property can be (remodeling a leased office, for example). There are many rules governing leased assets; they should be depreciated with care.
- Another common mistake is to continue depreciating property beyond the end of its recovery period. Cars are common examples of this.
- Conservative companies depreciate many assets as quickly as possible, despite the fact that this practice reduces reported net income. Knowledgeable investors watch carefully for such practices.

3.1.6. Distinguishing between a Capital and an Operating Lease

Determining whether a lease obligation is an operating or capital lease, for financial reporting purposes, requires that it be evaluated based on four criteria established by the FASB. The criteria are objective rules for making a judgment about who, the lessor or lessee, bears the risks and benefits of ownership of the leased property. If a lease is determined to be a capital, an asset and corresponding liability is recorded at the present value of the minimum lease payments. The capital asset is depreciated over time, while the liability is amortized as lease payments are made. Rental payments under operating leases are simply expensed as incurred. Due to the complexity of lease agreements, management judgment still plays a large role in distinguishing between operating and capitals.

Frequently Asked Questions

What is the definition of minimum lease payments?

The minimum lease payments are the rental payments to be made during the lease term, plus the amount of the bargain price, guaranteed residual value or penalty for failure to renew the lease at the end of its original term.

In determining whether a lease should be classified as an operating or capital lease, what interest rate should be used to discount the minimum lease payments?

The interest rate used to discount the minimum lease payments to their present value is the incremental borrowing rate of the lessee. The incremental borrowing rate is the interest rate that the lessee would have been charged if the assets had been acquired by borrowing the purchase price. If the lessor's implied interest rate for the lease is known and is lower than the estimated incremental borrowing rate of the lessee, then the lessee uses the implied rate to discount.

The Four FASB Criteria

Until the 1970s, many companies used leasing as a means to purchase tangible assets without recognizing their ownership or the lease obligation on the balance sheet. In substance, leases were off-balance sheet financing. Although all leases were required to be disclosed in the footnotes to the financial statements, even long-term finance leases did not appear as a liability. Because the basic measures of leverage, such as debt-to-equity or debt-to-capital ratios, do not consider off-balance sheet obligations, the accounting profession and the investment community believed that there needed to be more stringent guidelines for classifying leases as operating or financing. To promote consistency in the accounting treatment for leases, in 1976 the FASB issued statement no. 13, "Accounting for Leases." The statement contains four criteria to distinguish between an operating and capital (finance) lease:

- The lease agreement transfers ownership of the assets to the lessee during the term of lease.
- The lessee can purchase the assets leased at a bargain price (also called a bargain purchase option), such as $1, at the end of the lease term.
- The lease term is at least 75% of the economic life of the leased asset.
- The present value of the minimum lease payments is 90% or greater of the asset's value.

If a lease agreement does not meet any of these criteria, the lessee treats it as an operating lease for accounting purposes. If, however, the agreement meets one of the above criteria, it is treated as a capital lease.

Accounting for a Capital Lease

Capital leases are reported by the lessee as if the assets being leased were acquired and the monthly rental payments as if they were payments of principal and interest on a debt obligation. Specifically, the lessee capitalizes the lease by recognizing an asset and a liability at the lower of the present value of the minimum lease payments or the value of the assets under lease. As the monthly rental payments are made, the corresponding liability decreases. At the same time, the leased asset is depreciated in a manner that is consistent with other owned assets having the same use and economic life.

Accounting for an Operating Lease

If the lease is classified as an operating lease, the monthly lease payments are simply treated as rental expenses and recognized on the income statement as they are incurred. There is no recognition of a leased asset or liability.

Clearing Up Remaining Confusion

The FASB's attempt to establish objective criteria for distinguishing between operating and capital leases was a good first step. This has enabled companies to make prudent financial decisions in lease versus buy situations, based on the accounting treatment afforded a specific lease structure. Furthermore, financial professionals now have a framework within which to determine what lease terms create a capital lease. However, the use of financial engineering

still occurs. Consequently, many leases that are truly financing leases are recorded as operating leases, because their provisions have been altered to avoid qualification as capital leases.

When in doubt, a manager should always ask whether the risks and benefits of ownership have truly been passed from the lessor to the lessee. Facts that indicate the transfer has occurred are when maintenance, insurance and property tax expenses are born by the lessee or when the lessee guarantees a specific residual value on the leased property. Otherwise, managers are left with the four criteria outlined by the FASB and their own judgment.

3.2. Gathering data on comparative sales (market approach)

The market approach compares the subject to businesses, business-ownership interests and securities that have been sold on the open market and are largely similar. In this approach, there must be meaningful and relevant data available for analysis. It is essential that the business valuator ask the right questions if the data and the value measures derived are to be of practical use.

Among the methods for the market approach are the guideline public company method, the merger-and-acquisition method, and analyses of prior transactions of ownership interests in the company being valued. The first two involve the development by the valuator of relevant valuation ratios (market multiples) derived from transactional pricing information and underlying financial data of the "guideline companies" selected, and then the application of these ratios to the corresponding data of the subject company to arrive at value.

Guideline companies (public and private) are those that provide a reasonable basis for comparison to the investment characteristics of the company being valued. Ideal guideline companies are in the same industry as the subject company. However, if there is insufficient transactional evidence in that sector, the valuator might select firms in other industries having a similarity to the subject company in investment characteristics such as markets, products, growth and cyclical variability. While guideline-company empirical data can typically be found in transactions involving controlling or minority interests in publicly held or private companies, the concern here is with the use and interpretation of data that the valuation analyst gleans from a transactional database.

Using the guideline public company method, market multiples are derived from trading prices of shares of companies engaged in similar lines of business and that are actively traded in a free and open market. The guideline-company data are gathered to develop value measures that can be applied to the subject company's fundamental financial and other data and correlated in order to reach an indication of value for the subject firm's issued shares. It is critical that the valuation analysis distinguish between invested capital and equity.

The value measure, or valuation ratio, is determined by dividing the price of the guideline company shares by a financial variable (such as earnings, cash flow, EBITDA or revenue), calculated from the financial data of the guideline company. The valuation ratios are then

applied to the subject, after making the appropriate adjustments to ensure consistency in accounting conventions, the timing of the price data used in the valuation ratios, the selection of the underlying data used to compute the valuation ratios, and so on.

Similarly, consideration is also given to adjustments in respect of minority or controlling interests as well as marketability. In summary, the computation and application of the valuation ratios are intended to provide meaningful insight concerning the pricing of the subject, considering all relevant factors with an estimate being made, using public data, of the price that would be paid for the common stock of a closely held firm, assuming it was traded in an active market or on an exchange.

In the merger-and-acquisition method, valuation ratios are derived from open-market transactions of significant interests in companies engaged in the same or similar lines of business as the subject. The factors considered in judging a reasonable basis for comparing the subject to similar businesses, business ownership interests, or securities that have been sold in the open market include: sufficient similarity of qualitative and quantitative investment characteristics; extent and verifiability of data known about the similar investment; whether or not the price of the similar investment was obtained in an arm's length transaction as a result of a forced or distressed sale or other fact situation that may not provide evidence of fair market value; and the relevance of market conditions at the transaction date and those at or proximate to the valuation date for purposes of the subject valuation.

The analysis involves comparing the respective qualitative and quantitative factors relating to the company being valued to those of the guideline companies, including, if appropriate, dissimilarities with respect to minority, control and market-ability. The calculation and use of these valuation ratios (pricing multiples) are intended to provide meaningful insight as to the value of the business being appraised, considering all relevant factors. In brief, the valuation analyst must be extremely careful in the following areas: selecting meaningful (i.e., comparable) guideline companies; selecting the underlying data used to compute the valuation ratios; selecting the time periods and/or the averaging methods used for the underlying data; computing the valuation ratios; and determining the appropriate price data to be used as the numerator in the ratio.

It will be critical how the valuation ratios are selected and applied to the subject's underlying data. Therefore, as market transaction values — and ratios developed from them — can provide meaningful insight in valuing a business interest, there must be sufficient similarity of qualitative and quantitative investment characteristics; and even if such similarity does exist, adjustments may still be required to place the subject's relevant financial data on a basis consistent with those of the transacted business. If, however, there is insufficient information as to the specifics of the selected market transactions and the reasons behind the price paid by the purchaser, the use of publicly available transactional data in valuing a business can lead to a meaningless exercise.

In an ideal situation, background transactional details can be obtained from first-hand knowledge of financial and other data specific to the transaction (perhaps the business valuator had worked on a particular guideline-company transaction and therefore had intrinsic knowledge of the underlying background specifics concerning, among other things, the acquiree, the purchaser, the value of the consideration paid and the other substantive terms of the deal. With respect to the value of the consideration paid, there may have been an analysis and quantification of the post-acquisition synergies and/or strategic advantages perceived by

the buyer when pricing the target). In most cases, the valuation analyst will not have benefited from hands-on experience (either as a valuator, analyst, adviser or negotiator) and would seek pricing, financial and other data from guideline-company information.

While there may be many data points available, unless otherwise evident from the information obtained, it would be naive for the analyst to rely on such data in developing valuation multiples (such as price/revenue, price/cash flow, price/ earnings, invested capital/sales, market capitalization/EBITDA) without first seeking answers to the following types of critical questions (as appropriate in the circumstances) vis-à-vis each of the guideline-company transactions, to the extent such information has not been obtained:

- Do the data derived from the guideline companies relate to a transaction involving the shares of the businesses or the underlying operating assets? Do the data relate to total invested capital or to equity?
- Were there redundant or excess assets? If so, were they included in the deal?
- How similar are the respective characteristics of each guideline company and the subject in terms of, for example: size; diversification of markets and products/services; geographic location; demographics; political environment; market share; customer base; employee, customer, supplier and bank relationships; technological development; intellectual property protection; growth trends in revenue and profits; capital structure, leverage and liquidity; tangible asset backing; regulatory compliance; profit margins; return on tangible capital employed; maturity of the business; off-balance sheet assets and liabilities; depth and continuity of management?
- To what extent would the Notes —which are an integral part of the respective financial statements of the guideline companies — affect the interpretation of the respective balance sheets and income statements?
- Does the valuator know the contents and impact of the Notes? Were there contingent assets or liabilities? How were they dealt with? As an integral part of the financials, they can have a material impact on the valuator's analysis.
- How long had each guideline company been in business?
- Were any respective acquirees compelled to transact? Was there compulsion on the part of any respective purchasers? Were any transactions negotiated under distress?
- Did any of the transactions include payment in respect of a consulting or a non-competition agreement with the vendor?
- Were there any earn-out provisions? If so, what were their terms?
- Were any acquirees heavily dependent on only a few customers and/or suppliers?
- Were any of the guideline companies operated by a key person on whose services the business was highly dependent?
- What was the timing of the data for developing the respective valuation ratios with respect to the selected transactions?
- How long had each acquiree been exposed for sale in the marketplace?
- Were any of the transacted businesses acquired by a special purchaser who, for reasons such as perceived post-acquisition synergies or strategic advantages, was willing to pay a higher price for the acquiree than others? If so, what portion of the purchase price represented a premium for anticipated or strategic advantages?
- Were any material customers, suppliers, labour or other contracts under negotiation by a guideline company that could have impacted the transaction price?
- Were there new products ready to be launched by any of the guideline-company acquirees, which might otherwise render some of the financial data "irrelevant"?

- For high-tech, pharmaceutical and other firms owning intellectual property, how much had the respective acquirees been spending, and planning to spend, on research and development?
- Was the guideline-company share transaction in respect of 100% of the shares, 66.66% of the shares, 50% plus one or some other de jure control position?
- Was the transaction internally or externally financed? Was it at arm's length?
- How much of the price is related to the buyer's ability to lever the acquired assets?
- Was the price paid for the acquiree effectively adjusted with respect to the interest rate on the acquiree's debt?
- Was the price effectively adjusted in respect of the terms of the deal?
- Was the guideline company unionized?
- Was any portion of the transaction price not reflected in publicly disclosed data?
- Would any of the guideline-companies' accounting policies possibly have a material effect on the comparative financial data?
- Have certain patents been applied for in which commercial exploitation has not yet begun and therefore their potential is not reflected in the accounts?
- Did any guideline-company aquirees receive government loans, grants, subsidies?

Valuation ratios can provide insight into pricing/valuing the subject business, or may be used for corroborative purposes, provided the answers to the foregoing questions are obtained by the valuator. Taking figures from a transactional database and calculating a valuation ratio or multiple without considering such factors could lead to an erroneous conclusion.

The list might help in due diligence and may be useful in court for cross-examining an expert who relied on guideline-company data in developing a valuation. The key is meaningful comparisons

3.3. Gathering data on Economic Value Added

What It Measures

A company's financial performance, specifically whether it is earning more or less than the total cost of the capital supporting it.

Economic Value Added measures true economic profit, or the amount by which the earnings of a project, an operation, or a corporation exceed (or fall short of) the total amount of capital that was originally invested by the company's owners.

If a company is earning more it is adding value, and that is good. If it is earning less the company is in fact devouring value, and that is bad, because the company's owners (shareholders, for example) would be better off investing their capital elsewhere.

The concept's champions declare that EVA forces managers to focus on true wealth creation and maximizing shareholder investment. By definition, then, increasing EVA will increase a company's market value.

How It Works in Practice

EVA is conceptually simple and easy to explain: from net operating profit, subtract an appropriate charge for the opportunity cost of all capital invested in an enterprise—the amount that could have been invested elsewhere. It is calculated using this formula:

Net operating profit less applicable taxes – Cost of capital = EVA

If a company is considering building a new plant, and its total weighted cost over ten years is $80 million, while the expected annual incremental return on the new operation is $10 million, or $100 million over ten years, then the plant's EVA would be positive, in this case $20 million:

$100 million – $80 million = $20 million

An alternative but more complex formula for EVA is:

(% Return on invested capital – % Cost of capital) × original capital invested = EVA

Other Practical Considerations

- EVA is a measure of dollar surplus value, not the percentage difference in returns.
- Purists define EVA as "profit the way shareholders define it." They further contend that if shareholders expect a 10% return on their investment, they "make money" only when their share of after-tax operating profits exceeds 10% of equity capital.
- An objective of EVA is to determine which business units best utilize their assets to generate returns and maximize shareholder value; it can be used to assess a company, a business unit, a single plant, office, or even an assembly line. This same technique is equally helpful in evaluating new business opportunities.

3.4. Interviews...

Interviewes are major source for acquiring of information. Further below are discussed the most important steps that has to be taken and parties that should be contacted and the information that could be collected from them.

Scheduling the Sequence of Steps

Scheduling the sequence of reading and analyzing various aspects of the written material, seeing the company's operations and conducting interviews are matters that must be worked out to suit each case. Scheduling the various steps should be priority at the beginning of the valuation, along with defining the valuation assignment, and the schedule should be reviewed and changed as necessary throughout the process.

Generally, it is advisable to prepare in advance a thorough list of questions to ask during the field work. Usually, it is best to intersperse the field work with analysis of the written material. By studying the financial statements and other basic information, the analyst can gain an overview of the company and prepare a list of specific questions that will make the field work more meaningful and productive. Also, after seeing the operation and talking with management, the analyst will be able to read and analyze the written material with greater insight.

Usually, it is best to visit company facilities and interview management fairly early in the valuation process – after getting and reviewing enough preliminary information to get a general overview of the company.

1. History

The company's history might be an appropriate beginning. This will give the analyst a perspective on how the business got where it is. The history should cover when the business, or any of its predecessors, was founded, any acquisitions or divestitures along the way, any changes in the basic form of organization, any major changes in lines of business, and any changes in the geographical areas served. It should also cover major changes in ownership and how they came about.
Although the business's total history should be sketched briefly, the parts most relevant to the valuation analysis usually will be the most recent past.

2. Overview of the Company Position and Objectives

The analyst might well begin the discussion of the company's present position by asking for the chief executive officer's perception of the company's economic contribution – in other words, what does the company do, why does it need to be done, and what makes this company particularly well qualified to do it? What is the company's perception of the economic niche into which it fits, and how does it try to do the best job of fitting there? These questions should lead to a general discussion of the company's industry, its particular role within that industry, and its lines of products or services. What developments or trends are expected in the industry in the foreseeable future, and how will they impact the company?

The analyst should explore with top management the company's program for capital expenditures, acquisitions, divestitures, and research and development. These inquires should cover how much is being spent, for what, and how it is being financed.

3. Markets and Marketing

A major part of the marketing aspect of the interview should focus on competition. The analyst should make a list of the firms that the company considers competitors for each product or service and in each market segment it serves. The analyst should attempt to quantify the market share for each segment held by the company and by each major competitor and try to estimate the trends in these market shares.

On of the most important aspects of the marketing interview is determining how the company competes. Is it through product differentiation, either by uniqueness or quality? Is it heavily based on providing superior service? What is the company's pricing policy, and how is it forced to meet price competition?

Who currently uses and might use the company's products and services, and why? The market should be defined both geographically and by category of customer.
The interview should also cover marketing personnel and should ask about any changes in the marketing program that are in progress or anticipated.

4. Management

This is one of the most subjective aspects of a company valuation; yet in many companies it is a critical or even the most critical factor.
The analyst should make a list or organization chart of the key management and analyze their competence, breadth, and depth. The analyst should inquire about age, health, and qualifications for each key person. Also, the analyst should note each person's compensation package and level of compensation. The analyst should also inquire about the time and effort devoted by each key person and what the true contribution is to the company's well-being.

5. Operations

The purpose in any case is to learn what operations the company carries out, how efficiently and effectively it does so, and the prospects for either improvement and deterioration.

- ✓ **Supplies –** What are the key supplies and sources of those supplies? What about continuity of availability and of pricing? The analyst should list key suppliers and alternates, including names of individuals with whom the company deals. Analyst should inquire about supplier contracts or agreements and terms. Also, the analyst may wish to contact suppliers directly, either for additional information about the present or potential supply situation, the company's credit, reputation, or other attributes.
- ✓ **Energy –** What types of energy the company use, how much (both in units and costs) does it use, and where do the energy supplies come from? Is the company subject to temporary interruption of operations because of energy curtailment?
- ✓ **Labor –** The analyst must be concerned with the continuity of labor availability and cost as well as with the efficiency and effectiveness of the labor force. To what extent is the company unionized? What is the history of strikes? Is there an adequate pool of skilled labor in the area?

- ✓ **Regulatory Climate –** The analyst should inquire about government regulations that may impinge on the company's operations. To what extent does the company face costs associated with environmental protection? Also, the industry might impose restrictions that affect the company's value. To what extent is the company subject to industry regulations? Are there restrictions on pricing, promotional activities, geographical or other expansion, product innovation, or other phases of the company's operations?
- ✓ **Plant and Equipment** – Usually a company representative will take the analyst on a tour of company facilities. One objective of the tour is to give the analyst a better idea of the company's operations from a physical viewpoint. Another is to permit some evaluation of the physical plant's adequacy. The business enterprise appraiser makes such an evaluation only in a general sense. Any real estate or equipment appraisals needed usually are made by appraisers who specialize in those areas. If the analyst will need to communicate some description of the operations, facilities or both to someone lacking the opportunity to visit the facilities, such as a judge in a court case, it may be desirable to take a set of pictures while on tour. The analyst will inquire about sizes, such as acres or square feet, of various sites or buildings. In addition, the analyst will want to observe the efficiency of the location and layout and the condition of the facilities.
- ✓ **Inventory –** While touring the facilities, the analyst will have opportunity to observe inventories on hand. The analyst is interested in how much inventory is obsolete, damaged, excessive, or inadequate. This is good time to inquire about inventory turnover and quality.

6. Financial Analysis

As an aid in financial analysis, the analyst may conduct interviews with the chief financial officer, controller, other company personnel, or the firm's outside accountant or attorney.

- ✓ **Financial Position –** Interviews can contribute a great deal toward genuine understanding of a company's financial position beyond simply what the financial statements show, and the depth of inquiry will be beneficial (Inquiry on Current Assets, Fixed Assets, Other Assets, Current Liabilities, Capital Structure, Off-Balance-Sheet Items).
- ✓ **Analysis of Profitability –** To what extent does the company do profitability or cash flow budgeting or both? How far into the future, in how much detail, and how often is the budget reviewed? A review of past and current budgets can be a good starting point from which to gain greater insight into the company's profit history and potential (Analyzing the company's sales, Price changes, Fixed and Variable costs, Operating Leverage, Tax Rate).What can be done to make the company more profitable?
- ✓ **Identification of Changes or Aberrations –** To what extent are changes more or less predictable, such as seasonal, cyclical, or secular patterns? To explain abnormally high or low changes in financial statements and why is this and what does it imply?
- ✓ **Insurance –** Whether the company carries insurance can be significant for its viability. If on insurance is carried, the analyst should determine adequacy of reserves (Key-man life insurance, Product and other liability Insurance, All forms of casualty Insurance).
- ✓ **Management Emoluments –** The analyst may have to do some probing to identify all such items and their magnitude. The analyst should find out about the company's fleets of vehicles, including cars, boats and airplanes.
- ✓ **Dividend Policy –** What is the company's dividend-paying policy? The analyst should try to obtain a complete record of past dividend payments and to assess both the

company's dividend-paying capacity and intentions with regard to dividends if dividend-paying capacity exists.

- ✓ **Prior Transactions or Offers –** List of prior transactions in the stock. What price was paid for stock, or was it bonus stock at no cost to the recipient?

7. Catch-All Question

Even the most experienced interviewer may fail to ask just the right questions to elicit responses on every aspect bearing on the valuation. Therefore, somewhere near the end of each interview the analyst might ask each interviewee a catch-all question. This can be something like: "Is there any information that you know of that hasn't been covered and that could have a bearing on the valuation of the company?". This should help protect the analyst against material omissions in the questioning process and place the burden on company management if they are deliberately withholding material information.

8. Interviewing Professionals Related to the Company

It may not be necessary to interview outside professionals related to the company, but it usually is a good idea to get their names during the company interview in the event it might be desirable.

- ✓ **Attorney –** The most common reason for interviewing the company's attorney arises from the need for a legal interpretation of a company document or contract or for an assessment of a pending lawsuit or potential litigation.
- ✓ **Independent Accountant –** It may be necessary for the analyst to interview the company's outside accountant, usually, to get an explanation or interpretation of something in the financial statements, consult working papers, or obtain other details with which to augment the statements.
- ✓ **Banker –** If the company's banking relationship is important, the banker also may be a good source of general information about the company and industry.

9. Other Outside Interviews

Considerable discretion is called for in conducting certain outside interviews.

- ✓ **Customers –** They can tell why they use the company's products and discuss the outlook for their own businesses to help the analyst evaluate the continuing demand for the products or services.
- ✓ **Suppliers –** They may be helpful in identifying and evaluating the competition, as well as to explain technology changes in the industry.
- ✓ **Competitors –** The analyst may ask the competitor many of the same questions asked of the subject company (e.g. demand, supply, and pricing factors, technological change in the industry, etc.)
- ✓ **Former Employees –** Why they left the company and other aspects of the company as seen in hindsight and from an objective viewpoint.

10. Conclusion

A good analyst can gain a great deal of insight into a company through the field trip and management interview process. The preceding queries should provide the analyst with a perspective on the company being valued and yield a multitude of details relevant to the valuation assignment. What the analyst gets from the process will depend partly on the thoroughness of preparation and partly on the degree of cooperation provided by the subject company and those being interviewed.

4. FINANCIAL ANALYSIS

4.1. How to read financial data (BS, IS, CFS, etc.)

4.1.1. Reading a profit and loss account

A profit and loss account is a statement of the income and expenditure of a business over the period stated, drawn up in order to ascertain how much profit the business made. Put simply, the difference between the income from sales and the associated expenditure is the profit or loss for the period. "Income" and "expenditure" here mean only those amounts directly attributable to earning the profit and thus would exclude capital expenditure, for example.

Importantly, the figures are adjusted to match the income and expenses to the time period in which they were incurred—not necessarily the same as that in which the cash changed hands.

Frequently Asked Questions

What is a profit and loss account?

A profit and loss account is an accountant's view of the figures that show how much profit or loss a business has made over a period. To do this, it is necessary to allocate the various elements of income and expenditure to the time period concerned, not on the basis of when cash was received or spent, but on when the income was earned or the liability to pay a supplier and employees was incurred. While capital expenditures are excluded, depreciation of property and equipment is included as a noncash expense.

Thus if you sell goods on credit, you will be paid later but the sale takes place upon the contract to sell them. Equally if you buy goods and services on credit, the purchase takes place when you contract to buy them, not when you when you actually settle the invoice.

What does a profit and loss account not show?

Most importantly, a P&L account is not an explanation of the cash coming into and going out of a business.

Here is a simple example of a profit and loss account for a particular year:

Sales		1,000
Opening Stock	100	
Purchases	520	
	620	
Closing Stock	80	
Cost of Sales		540
Gross Profit		460
Wages	120	
Other Overhead	230	
		350
Net Profit before Tax		110
Tax		22
Net after Tax		88
Dividends		40
Retained Profit		48
Retained Profit Brought Forward		150
Retained Profit Carried Forward		198

Note that the presence of stock and purchases indicates that the business is trading or manufacturing goods of some kind, rather than selling services.

Defining the Individual Elements

- *Sales*—the invoiced value of the sales in the period.
- *Stock*—the value of the actual physical stock held by the business at the opening and closing of the period. It is always valued at cost, or realizable value if that is lower, never at selling price.
- *Purchases and Other Direct Costs*—the goods or raw materials purchased by the business for resale—not capital items used in the business, only items used as part of the direct cost of its sales. In other words, those costs which vary directly with sales, as distinct from overhead (like rent) which do not.

When a business holds stock, the purchases figure has to be adjusted for the opening and closing values in order to reach the right income and expenditure amounts for that period only. Goods for resale bought in the period may not have been used purely for that period but may be lying in stock at the end of it, ready for sale in the next. Similarly, goods used for resale in this period will consist partly of items already held in stock at the beginning of it. So take the amounts purchased, add the opening stock and deduct the closing stock. The resulting adjusted purchase figure is known as "cost of sales."

In some businesses there may be other direct costs apart from purchases included in cost of sales. For example, a manufacturer may include some wages if they are of a direct nature (wages of employees directly involved in the manufacturing process, as distinct from office staff say). Or a building contractor would include plant hire in direct costs, as well as purchases of materials.

- *Gross Profit*—the difference between sales and cost of sales. This is an important figure as it measures how much was actually made directly from whatever the business is selling, before it starts to pay for overhead.

The figure is often expressed as a percentage ratio, when it is known as the "gross profit margin." In our example the GPM is 460:1,000—or 46%. Ratios are really only useful as comparison tools, either with different periods of the same business or with other businesses.

- *Overhead*—the expenses of the business which do not vary directly with sales. They include a wide range of items such as rent, most wages, advertising, phones, interest paid on loans, audit fees, and so on.
- *Net Profit before Tax*—the result of deducting total overhead from gross profit. This is what the business has made before tax is paid on that profit.
- *Tax*—This will not actually have been paid in the year concerned, but is shown because it is due on the profit for that period. Even then the figure shown may not be the actual amount due, for various reasons such as possible overpayments from previous years. Tax can be a very complex matter, being based upon a set of changeable rules.
- *Net Profit after Tax*—the result after deducting the tax liability—the so-called bottom line. This is the amount that the company can do with as it wishes, possibly paying a dividend out of part of it and retaining the rest. It is the company's reward for actually being in business in the first place.
- *Dividends*—a payment to the shareholders as a reward for their investment in the company. Most publicly listed companies of any size pay dividends to shareholders. Private companies may also do so, but this may be more for tax reasons. The dividend in the example shown is paid out of the net profit after tax, but legally it is not permitted to exceed the total available profit. That total available profit is comprised of both the current year's net profit after tax and the retained profit brought forward from previous years.
- *Retained Profit*—the amount kept by the company after paying dividends to shareholders. If there is no dividend, then it is equal to the net profit after tax.
- *Retained Profit Brought Forward*—the total accumulated retained profits for all earlier years of the company's existence.
- *Retained Profit Carried Forward*—the above figure brought forward, plus the current year's retained profit. This new total will form the profit brought forward in the next accounting period.

How to Interpret the Figures

A lot of accounting analysis is valid only when comparing the figures, usually with similar figures for earlier periods, projected future figures, or other companies in the same business.

On its own a P&L account tells you only a limited story, though there are some stand alone facts that can be derived from it. What our example does show, even in isolation, is that this business was successful in the period concerned. It made a profit, not a loss, and was able to pay dividends to shareholders out of that profit. Clearly a pretty crucial piece of information.

However, it is in comparisons that such figures start to have real meaning.

The example figures reveal that the gross profit margin was 46%, an important statistic in measuring business performance. The net profit margin before tax was 110:1,000, or 11%. You could take the margin idea further and calculate the net profit after tax ratio to sales as 88:1,000, being 8.8%. Or you could calculate the ratio of any expense to sales. In our example, the wages:sales ratio is 120:1,000 or 12%.

If you then looked at similar margin figures for the preceding accounting period, you would learn something about this business. Say the gross margin was 45% last year compared with 46% this year—there has been some improvement in the profit made before deducting overhead. But then suppose that the net profit margin of 8.8% this year was 9.8% last year. This would tell you that, despite improvement in profit at the gross level, the overhead has increased disproportionately. You could then check on the ratio of each item of the overhead to sales to see where this arose and find out why. Advertising spending could have shot up, for example, or perhaps the company moved to new premises incurring a higher rent. Maybe something could be tightened up.

Another Commonly Used Ratio

Another ratio often used in business analysis is return on capital employed. Here we combine the profit and loss account with the balance sheet by dividing the net profit (either before or after tax as required) by shareholders' funds. This tells you how much the company is making proportionate to money invested in it by the shareholders—a similar idea to how much you might get in interest on a bank deposit account. It's a useful way of comparing different companies in a particular industry, where the more efficient ones are likely to derive a higher return on capital employed.

Common Mistakes

Assuming That the Bottom Line Represents Cash Profit from Trading

It does not! There are a few examples where this is the case: a simple cash trader might buy something for one price, then sell it for more; his profit then equals the increase in cash. But a business that buys and sells on credit, spends money on items that are held for the longer term such as property or machinery, has tax to pay at a later date, and so on, will make a profit that is not represented by a mere increase in cash balances held. Indeed, the cash balance could quite easily decrease during a period when a profit was made.

4.1.2. Reading a cash flow statement

In their annual report, most public companies must publish a cash flow statement—together with the profit and loss account and a balance sheet. As the name suggests, the purpose of a cash flow statement is to explain the movement in cash balances or bank overdrafts held by the business from one accounting period to the next.

The balance sheet shows the assets and liabilities at the end of the period, with comparative figures for the start of it. The profit and loss account shows how much profit was generated by the business in the period. The cash flow statement is the third part of the financial picture of the business over the period.

Frequently Asked Questions

What is a cash flow statement?

Over an accounting period, the money held by a business at the bank (or its overdrafts) will have changed. The purpose of the cash flow statement is to show the reasons for this change. If you look at the practical guide on profit and loss (Reading a Profit and Loss Account), one of the common mistakes illustrated was the erroneous belief that the profit was equal to the cash generated by a business. It is not, but the cash flow statement is the link between profit and cash balance movements. It takes you down the path from profit to cash. The figures are derived from those published in the annual accounts, and notes will explain how this derivation is arrived at.

What does a cash flow statement not show?

In the same way that a profit and loss account does not show the cash made by the business, a cash flow statement does not show the profit. It is entirely possible for a loss-making business to show an increase in cash, and the other way round too.

Here is a simple example of a cash flow statement for a particular year:

Net Cash Inflow from Operating Activities		7,020
Returns on Investments and Finance Costs		
Interest Paid	820	
Less Interest Received	90	
Net Cash Outflow from Finance Costs		(730)
Taxation		(1,060)
Capital Expenditure		
Sale of Fixed Assets	760	
Less Purchase of Fixed Assets	4,420	
Net Cash Outflow from Capital Expenditure		(3,660)
Dividends Paid		(1,530)
Net Cash Inflow before Financing		40
Financing		
New Loans	1,000	
Loan Repayments	(300)	
Finance Lease Repayments	(100)	
Net Cash Inflow from Financing		600
Increase in Cash		640

Defining the Individual Elements

- *Net Cash Inflow from Operating Activities*: Broadly this is the profit of the business, before depreciation plus the change in debtor and creditor balances. There may also be other items included here. In the statutory annual accounts of companies, there will be an explanation to show how this net cash inflow figure is derived from the profit and loss account and balance sheet. Depreciation is excluded because it does not represent a cash cost.

Debtor and creditor balance changes are included here because they represent an inflow or outflow of cash to the business. Thus if customers owe you less or more at the end of a period than at the beginning of it, it follows that there must have been cash flowing in or out of the business as a result. A reduction in debtors means that cash has come in to the business, and the reverse for an increase in debtors. The same applies to the creditor balances of suppliers. An increase here means a cash inflow, with a decrease denoting an outflow.

- *Returns on Investments and Finance Costs*: These figures comprise interest received on cash balances, less interest paid on debt. There could be other forms of investment income here, such as dividends on shares owned.
- *Net Cash Outflow from Finance Costs*: This is not a new figure but the net result of the above items, identified as returns on investments. In our example the result is an outflow of cash. That is, the interest paid on debt exceeded the interest received on cash. It could in some circumstances be the other way around, where for example a business has substantial cash balances earning interest.
- *Taxation*: Self-explanatory, this is the outflow of cash arising from corporation tax paid by the business. It can on occasion be an inflow, where the company has obtained a repayment of corporation tax for some reason.
- *Capital Expenditure*: This is cash expended on fixed assets bought for the business, less cash received from the sale of assets no longer required by the business.
- *Net Cash Outflow from Capital Expenditure*: This is not a new figure but the net result of the above items, identified as expenditure on new fixed assets less receipts from the sale of disposals of such items. In our example there is a large outflow, which generally would be the norm. It can happen sometimes though that a business realizes more from the sale of fixed assets in a particular period than it expends on items acquired.
- *Dividends Paid*: Self-explanatory; this is the outflow of cash arising from paying dividends to shareholders.
- *Net Cash Inflow before Financing*: This is not a new figure but a subtotal of the items above. In our example, the figure of $40 shown happens to be an inflow but it could just as easily have been an outflow. There is no typical figure here, it is just as common to see net inflows as outflows.

It is important to understand what this figure represents. It is the net cash result of running the business in the period concerned, after paying tax to the government and dividends to the shareholders. However, as its label indicates, it doesn't include any financing.

- *Financing*: This term includes the raising of new loans, the repayment of old ones and other methods of financing such as issuing new shares. In the example the company borrowed $1,000 in new loans, which creates a cash inflow of that sum, and repaid $300 on old debt plus a further $100 on equipment leases (which are another form of finance), making a net inflow on finance of $400.
- *Increase in Cash* (the bottom line): Adding the net inflow of $600 from finance to the $40 generated by business operations gives us an overall net cash inflow of $640. This is the bottom line. It means that we have $640 more in the bank at the end of the accounting period than at the beginning of it.

How to Interpret the Figures

As suggested above, the cash flow statement is the third section of the primary set of accounting documents used to explain and analyze businesses. It is a "derived schedule,"

meaning that the figures are pulled from the profit and loss account and balance sheet statements, linking the two.

Its purpose is to analyze the reasons why the company's cash position changed over an accounting period. For example, a sharp increase in borrowings could have several explanations—such as a high level of capital expenditure, poor trading, an increase in the time taken by debtors to pay, and so on. The cash flow statement will alert management to the reasons for this, in a way that may not be obvious merely from the profit and loss account and balance sheet alone.

The generally desirable situation is for the net position before financing to be positive. Even the best-run businesses will sometimes have an outflow in a period (for example in a year of high capital expenditure), but positive is usually good. This becomes more apparent when comparing the figures over a period of time. A repeated outflow of funds over several years is usually an indication of trouble. To cover this, the company must raise new financing and/or sell off assets which will tend to compound the problem, in the worst cases leading to failure.

Cash is critical to every business, so it is important for the management to understand where its cash is coming from and going to. The cash flow statement gives us this information in an abbreviated form. You could argue that the whole purpose of a business is to start with one sum of money and, by applying some sort of process to it, arrive at another and higher sum, continually repeating this cycle.

Common Mistakes

Confusing "Cash" and "Profit"

As mentioned previously, the most common mistake with cash flow statements is the potential confusion between profit and cash. They are not the same!

Not Understanding the Terminology

It is clearly fundamental to an understanding of cash flow statements that the reader is familiar with terms like "debtors," "creditors," "dividends," and so on. But more than appreciating the meaning of the word "debtors," it is quite easy to misunderstand the concept that, for example, an increase in debtors is a cash outflow, and equally that an increase in creditors represents an inflow of cash to the business.

4.1.3. Reading a balance sheet

A balance sheet will tell us something about the financial strength of a business on the day that it is drawn up. That situation changes constantly, so you could say it is more like a snapshot than a movie. Although the method of producing a balance sheet is standardized,

there can be a certain element of subjectivity in interpreting it. Different elements of the balance sheet can tell you different things about the how the business is doing.

This actionlist gives an overview of a balance sheet and looks at a brief selection of the more interesting figures that help with interpretation. It's important to remember that a lot of these figures do not tell you that much in isolation, it is in trend analysis or comparisons between businesses that they speak more lucidly.

Frequently Asked Questions

What is a balance sheet?

A balance sheet is an accountant's view, the book value of the assets and liabilities of a business at a specific date and on that date alone. The term "balance" means exactly what it says—that those assets and liabilities will be equal. In showing how the balance lies, the balance sheet gives us an idea of the financial health of the business.

What does a balance sheet not do?

A balance sheet is not designed to represent market value of the business. For example, property in the balance sheet may be worth a lot more than its book value. Plant and machinery is shown at cost less depreciation, but that may well be different from market value. Stock may turn out to be worth less than its balance-sheet value, and so on.

Also there may be hidden assets, such as goodwill or valuable brands, that do not appear on the balance sheet at all. These would all enhance the value of the business in a sale situation, yet are invisible on a normal balance sheet.

Here is a very simple company balance sheet:

Fixed Assets		1,000
Current Assets	700	
Less Current Liabilities	400	
Net Current Assets		300
		1,300
Less Long-term Loans		200
Net Assets		1,100
Profit and Loss Account		500
Share Capital		600
Shareholders' Funds		1,100

Defining the Individual Elements

- *Fixed Assets*—items that are not traded as part of a company's normal activities but enable it to function, such as property, machinery or vehicles. These are tangible assets (meaning you can kick them). This heading can also include intangible assets (you cannot kick them). A common example is "goodwill," which can arise upon the acquisition of one business by another.
- *Current Assets*—items that form the trading cycle of the business. The most common examples are stock, debtors, and positive bank balances.
- *Current Liabilities*—also items that form the trading cycle of the business but represent short-term amounts owed to others. Examples will be trade creditors, taxes, and bank overdrafts–broadly, any amount due for payment within the next 12 months from the date of the balance sheet.
- *Net Current Assets*—not a new figure, but simply the difference between current assets and current liabilities, often shown because it may be a useful piece of information.
- *Long-term Loans*—debt that is repayable more than one year from the date of the balance sheet.
- *Net Assets*—also not a new figure, but the sum of fixed assets plus net current assets less long-term loans. In other words, all of the company assets shown in its books, minus all of its liabilities.
- *Profit and Loss Account*—the total of all the accumulated profits and losses from all the accounting periods since the business started. It increases or decreases each year by the net profit or loss in that period, calculated after providing for all costs including tax and dividends to shareholders.
- *Share Capital*—the number of shares issued, multiplied by their nominal value. The latter is the theoretical figure at which the shares were originally issued and has nothing to do with their market value.
- *Shareholders' Funds*—not a new figure, but the sum of the profit and loss account plus the share capital. It represents the total interest of the shareholders in the company.

How to Interpret Them

Note that balance sheets differ between one industry and another in the sense of the range and type of assets and liabilities that exist. For example, a retailer will have little in the way of trade debtors because it sells for cash, or a manufacturer is likely to have a far larger investment in plant than a service business like an advertising agency. So the interpretation must be seen in the light of the actual trade of the business.

Reading a balance sheet can be quite subjective—accountancy is an art, not a science and, although the method of producing a balance sheet is standardized, there may be some items in it that are subjective rather than factual. The way people interpret some of the figures will also vary, depending what they wish to achieve and how they see certain things as being good or bad.

Look First at the Net Assets/Shareholders' Funds

Positive or negative? Our example, being a healthy business, has net assets of a positive $1,100. Positive is good. If there were 600 shares in issue, it would mean that the net assets per share are $1.83.

If it had negative assets (same thing as net liabilities), this might mean that the business is heading for difficulty unless it is being supported by some party such as a parent company, bank, or other investor. When reading a balance sheet with negative assets, consider where the support will be coming from.

Then Examine Net Current Assets

Positive or negative? Again, our example has net current assets of a positive $300. This means that, theoretically, it should not have any trouble settling short-term liabilities because it has more than enough current assets to do so. Negative net current assets suggest that there possibly could be a problem in settling short-term liabilities.

You can also look at NCA as a ratio of current assets/current liabilities. Here, a figure over one is equivalent to the NCA having a positive absolute figure. The ratio version is more useful in analyzing trends of balance sheets over successive periods or comparing two businesses.

A cut-down version of looking at NCA considers only (debtors + cash)/(creditors) thus excluding stock. The reasoning here is that this looks at the most liquid of the net current asset constituents and again a figure over one is the most desirable. Also a ratio that is more meaningful in trends or comparisons.

The Significance of Trade Debtor Payments …

Within current assets, we have trade debtors. It can be useful to consider how many days worth of sales are tied up in debtors—given by (debtors × 365)/annual sales. This provides an idea of how long the company is waiting to get paid. Too long, and it might be something requiring investigation. However, this figure can be misleading, where sales do not take place evenly throughout the year. A construction company might be an example of such a business: one big debtor incurred near the year end would skew the ratio.

… And Trade Creditor Payments

Similar to the above, this looks at (trade creditors × 365)/annual purchases, indicating how long the company is taking in general to pay its suppliers. This is not so easy to calculate because the purchases for this purpose include not only goods for resale but all the overheads as well.

Debt

Important to most businesses, this figure is the total of long and short-term loans. Too much debt might indicate that the company would have trouble, in a downturn, in paying the interest. It is difficult to give an optimum level of debt because there are so many different situations, depending on a huge range of circumstances.

Often, instead of an absolute figure, debt is expressed as a percentage of shareholders' funds and known as "gearing" or "leverage." In a public company, gearing of 100% might be considered pretty high, whereas debt of under 30% may be seen as on the low side.

Common Mistakes

Believing That Balance Sheet Figures Represent Market Value

It is completely incorrect to assume that a balance sheet is a valuation of the business. Its primary purpose is that it forms part of the range of accounting reports used for measuring business performance—along with the other common financial reports like profit and loss

accounts and cash flow statements. Management, shareholders, and others such as banks will use the entire range to assess the health of the business.

Forgetting That the Balance Sheet Is Valid Only for the Date at Which It Is Produced

A short while after a balance sheet is produced, things could be quite different. In practice there frequently may not be any radical changes between the date of the balance sheet and the date when it is being read, but it is entirely possible that something could have happened to the business that would not show. For example, a major debtor could have defaulted unexpectedly. So remember that balance sheet figures are valid only as at the date shown, and are not a permanent picture of the business.

Confusion over Whether in Fact All Assets and Liabilities Are Shown in the Balance Sheet

Some businesses may have hidden assets, as suggested above. This could be the value of certain brands or trademarks, for example, for which money may not have ever been paid. Yet these could be worth a great deal. Conversely, there may be some substantial legal action pending which could cost the company a lot, yet is not shown fully in the balance sheet.

4.1.4. Reading a book value statement

Book value represents a company's net worth, based on the difference between assets and liabilities plus debt. Typically, book value is substantially different from market value, especially in high-tech and knowledge-based industries whose primary assets are intangible.

When compared with its market value, book value helps reveal how a company is regarded by the investment community. A market value that is notably higher than book value indicates that investors have a high regard for the company. A market value that is, for example, a multiple of book value suggests that investors' regard may be unreasonably high-as was shown in the painful plunge of dot.com companies in 2000 and 2001.

The reverse is also true, of course; indeed, it may suggest that a company's stock is a bargain.

A companion measure is book value per share. It shows the value of the company's assets that each shareholder theoretically would receive if a company were liquidated.

HOW IT WORKS IN PRACTICE

To calculate book value, subtract a company's liabilities and the value of its debt and preferred stock from its total assets. All of these figures appear on a company's balance sheet.

For example:

	$
Total assets	1,300
Current liabilities	- 400
Long-term liabilities, preferred stock	- 250
Book value	*= 650*

Book value per share is calculated by dividing the book value by the number of shares outstanding. If our example is expressed in millions of dollars and the company has 35 million shares outstanding, book value per share would be $650 million divided by 35 million:

650 / 35 = $18.57 book value per share

OTHER PRACTICAL CONSIDERATIONS

- Related terms include: adjusted book value or modified book value, which is book value after assets and liabilities are adjusted to market value; and tangible book value, which also subtracts intangible assets, patents, trademarks, and the value of research and development. The rationale is that these items cannot be sold outright.
- Book value can also mean the value of an individual asset as it appears on a balance sheet, in which case it is equal to the cost of the asset minus any accumulated depreciation.
- Though often considered a realistic appraisal, book value can still contain unrealistic figures. For example, a building might be fully depreciated and have no official asset value but could still be sold for millions, or four-year-old computer equipment that is not fully depreciated might have asset value but no market value, given its age.

4.1.5. Understanding the activity based costing

The case of ABC company discussed below illustrates how activity based castings are done in everyday practice.

- ABC identifies the relationship between a business activity and all the resources needed to conduct it by assigning costs to each of those resources, thus presenting the true total expense of the entire activity.
- ABC can account for so-called “soft” or indirect operating costs, and thus produce a more revealing, and perhaps startlingly different, financial picture than other accounting methodologies such as standard costing might offer.
- Used properly, ABC helps management better to distinguish operations that add value from those that do not, permitting more informed decisions about such matters as pricing, product mix, capital investments, and organizational change.

- In turn, ABC's advocates praise it as a more effective tool to identify and control costs, improve productivity, and increase profits.

Frequently Asked Questions

When did ABC start?

ABC came of age in the 1980s amid manufacturers' furious efforts to raise the quality of their products while simultaneously eliminating every unnecessary cost from their operations. The dramatic improvements realized by manufacturers have led to ABC becoming a widely used tool, especially in the manufacturing industry.

What are the basic steps of ABC?

There are five:

- identify the product or service to be studied;
- determine all the resources and processes that are required to create the product or deliver the service, and their respective costs;
- determine the "cost drivers" for each resource: the cost of labor as well as raw materials;
- collect cost and other data such as time taken, data for each process and resource;
- use the data to calculate the overall cost of the product or service.

What are ABC's principal advantages?

First, ABC can gauge virtually any activity, be it a manufacturing process, a business process, the performance of a service, or an administrative operation. Second, it considers a much wider range of resources and materials than more traditional accounting methodologies, and can thus present a more complete picture.

What are ABC's primary weaknesses?

It can be an very time-consuming exercise because of the volumes of data it demands. Also, if not managed properly, ABC can transform every manager into an accountant whose energies become fixed on tracking the costs of the activity, rather than on tracking and perfecting the activity itself.

What kind of business sectors use ABC?

The list ranges from accountants to zoologists. It may be especially helpful to knowledge-based businesses that rely primarily on human services and related resources, whose total costs may be difficult to measure with more traditional accounting yardsticks.

What is critical to ABC's success?

Without gaining and maintaining the enduring commitment of all individuals, even a modestly detailed initiative will probably fail. It's also best to start with pilot projects to demonstrate success.

What preliminary steps are needed?

First, an organization needs to understand its activities and the resources that these require. Second, it needs to understand thoroughly the amount of information required, and the expense of generating that information. It must also first determine what level of accuracy will be acceptable.

How it works in practice

Creating an ABC cost accounting system requires three preliminary steps:

- converting to an accrual basis of accounting;
- defining cost centers and cost allocation;
- determining process and procedure costs.

Businesses have traditionally relied on the cash basis of accounting, which recognizes income when received and expenses when paid. ABC's foundation is the accrual-basis income statement. The numbers this statement presents are assigned to the various procedures performed during a given period. Cost centers are a company's identifiable products and services, but also include specific and detailed tasks within these broader activities. Defining cost centers will of course vary by business and method of operation. What is critical to ABC is the inclusion of all activities and all resources.

Once these steps have been taken, the results are often more than satisfying.

Banks and financial services firms have long used ABC-like methods to confirm that investments in automated teller machines would be both cheaper than continuing to rely on tellers and clerks and in their customers' best interests.

Railroad companies have used the methodology to determine the cost of processing bills of lading by hand, fax, and the Internet. Studying such costs confirmed the wisdom of using e-commerce, generating annual savings of up to $1 million.

Publishers launching "new media" services can more accurately calculate the true costs of creating material for them, then compare such costs to those required to produce traditional publications and draw more accurate conclusions about what best serves their long- and short-term interests.

Law firms are better positioned to confirm that the hourly fees they charge—no matter how princely they may at first appear—do, in fact, enable them to provide their services profitably.

Finally, healthcare providers use ABC to measure profitability, eliminate unnecessary costs, and plan for change. A medical practice that knows the actual cost of providing a specific service, for example, can make far better decisions about the price of managed health care.

For instance, let's say the Apple-a-Day Medical Clinic includes three physicians, Drs. Peel, Core, and Stem. Their clinic has an in-house laboratory and a radiology department. All direct revenues and expenses are allocated to the physician who performs the service and incurs the expense. Indirect variable overhead costs are allocated to each physician based on the proportion of total revenues that each generates in a given period. Fixed overhead costs are

divided equally among physicians. Because of their respective incomes and expense allocations, each physician would represent a separate cost center.

Additional cost centers for this medical practice could be laboratory, radiology, and administration. As cost centers are defined, they could further be classified as, say, "patient service centers" or "support centers." In this example, laboratory, radiology, and each individual physician's activity would be patient service centers, while administration would be a support center.

Once cost centers are identified, management teams can begin studying the activities each one engages in and allocating the expenses each one incurs, including the cost of employee services. In this healthcare scenario, activities would range from actual treatment by physicians and nurses, X-rays, medical tests and assessments of their results, plus such administrative support services as personnel, bookkeeping, rent, utilities, property insurance, office supplies, advertising, telecommunications expenses, and equipment costs related to the administrative function. Rent, utilities, and property insurance are usually allocated on the basis of the square footage that the particular activity covers.

Tracking and allocating the detailed costs of individual activities and procedures can be accomplished by different methods, with various degrees of accuracy. The more detailed the cost analysis, of course, the greater the accuracy of the data. Then again, as the detail increases, so does the time and expense.

The most appropriate method is developed from time studies and direct expense allocation. Management teams that choose this method will need to devote several months to data collection in order to generate sufficient information to establish the personnel components of each activity's total cost. The cost of this exercise itself can be significant, but also worthwhile. Proponents say ABC has resulted in cost savings worth as much as 14 times the cost of the exercise. More importantly, the exercise has provided solid documentation for decisions that "seemed correct," as a Chrysler Corporation team once reported "but could not be supported with hard evidence."

Time studies establish the average amount of time required to complete each task, plus best- and worst-case performances. Only those resources actually used are factored into the cost computation; unused resources are reported separately. These studies also can advise management how best to monitor and allocate expenses which might otherwise be expressed as part of general overhead, or go undetected altogether.

Notably, determining how much of an operation's personnel is underused or unused can significantly help management planning, specifically by exposing activities that are overstaffed or understaffed. This can be especially helpful to any knowledge-based business, since payroll is almost always its highest cost. Moreover, in any business, the more efficiently an enterprise deploys its personnel, the more profitable it will be.

In addition, this type of analysis can also establish useful performance benchmarks within an operation, and might even allow for a comparison of procedure costs with industry averages.

Common Mistakes

Getting Caught Up in the Details

Notwithstanding its successes, ABC remains a tool, not an end in itself. Organizations can lose sight of that fact if they are not careful, and end up allowing it to dominate their working lives.

The enormity and complexity of such a project should never be underestimated. The data requirements alone are daunting. It is all too easy to get caught up in ABC's details and mechanics. In turn, estimating some costs is often recommended, to minimize the level of detail.

At the same time, however, some details are important prerequisites of objectivity and success. For example, if time studies are not used, some other measure must be used to allocate personnel and related costs, as well as indirect costs such as percentage of revenues or income, or the number of customer calls. These methods require far less time for compiling data and are less costly, but drawbacks abound. For one thing, accuracy suffers, and they are almost always subjective, potentially to the point of compromising the entire initiative. Being far less precise, these alternative methods also do not differentiate between used and unused personnel resources, and will not provide information on unused capacity or trends in procedure costs.

Without the aid of computer software that has been developed to automate the process, ABC can be hopelessly time-consuming. Indeed, unaided by technology, ABC might well be hoist with its own petard and exposed as an outrageous waste of time.

Like any cost accounting system, activity based costing is not static. Once established, it needs to be maintained and updated as business conditions and organizations change.

Finally, in delivering its crystal-clear pictures, activity based costing also has the potential to make individual champions of particular products or services squirm, because it may reveal them to be far more expensive than they might otherwise appear. All the more reason for advocating caution: "Watch out what you wish for!"

If a management team is to reduce and eliminate costs, it must first identify them and grasp their impact on specific processes or products. Because activity based costing can paint a single picture that reveals all the individual direct and indirect costs a business incurs in a given operation, it can be a powerful tool for both assessing current operations and guiding prompt and intelligent reactions as circumstances change. In fact, it's also known as activity based management (ABM).

4.1.6. Understanding the concept of asset utilisation

The reports on assets utilization show how efficiently an organization uses its resources and, in turn, the effectiveness of the organization's managers.

The success of any enterprise is tied to its ability to manage and leverage its assets. Hefty sales and profits can hide any number of inefficiencies. By examining several relationships between sales and assets, asset utilization delivers a reasonably detailed picture of how well a company is being managed and led-certainly enough to call attention both to sources of trouble and to role-model operations.

Moreover, since all the figures used in this analysis are taken from a company's balance sheet or profit and loss statement, the ratios that result can be used to compare a company's performance with individual competitors and with industries as a whole.

Many companies also use this measure to evaluate not only their aggregate success but also to determine compensation for managers.

HOW IT WORKS IN PRACTICE

Asset utilization relies on a family of asset utilization ratios, also called activity ratios. The individual ratios in the family can vary, depending on the practitioner. They include measures that also stand alone, such as accounts receivable turnover and asset turnover. The most commonly used sets of asset utilization ratios include these and the following measures.

Average collection period is also known as days sales outstanding. It links accounts receivable with daily sales and is expressed in number of days; the lower the number, the better the performance. Its formula is:

Accounts receivable / Average daily sales = Average collection period

For example, if accounts receivable are $280,000, and average daily sales are 7,000, then:

280,000 / 7,000 = 40

Inventory turnover compares the cost of goods sold (COGS) with inventory; for this measure, expressed in "turns," the higher the number the better. Its formula is:

Cost of goods sold / Inventory

For example, if COGS is $2 million, and inventory at the end of the period is $500,000, then

2,000,000 / 500,000 = 4

Some asset utilization "repertoires" include ratios like debtor days, while others study the relationships listed below.

Depreciation/Assets measures the percentage of assets being depreciated away to gauge how quickly product plants are aging and assets are being consumed.

Depreciation/Sales measures the percentage of sales that is tied up covering the wear and tear of the physical plant

In either instance, a high percentage could be cause for concern.

Income/Assets measures how well management uses its assets to generate net income. It is the same formula as return on assets.

Income/Plant, which measures how effectively a company uses its investment in fixed assets to generate net income.

In these two instances, high numbers are desirable.

Plant/Assets expresses the percentage of total assets that is tied up in land, buildings, and equipment.

By themselves, of course, the individual numbers are meaningless. Their values lie in how they compare with the corresponding numbers of competitors and industry averages. A company with an inventory turnover of 4 in an industry whose average is 7, for example, surely has room for improvement, because the comparison indicates it is generating fewer sales per unit of inventory and is therefore less efficient than its rivals.

OTHER PRACTICAL CONSIDERATIONS

- Asset utilization is particularly useful to companies considering expansion or capital investment: if production can be increased by improving the efficiency of existing resources, there is no need to spend the sums expansion would cost.
- Like all families of ratios, no single number or comparison is necessarily cause for alarm or rejoicing. Asset utilization proves most beneficial over an extended period of time.
- Studying all measures at once can devour a lot of time, although computers have trimmed hours into seconds. Managements in smaller organizations may conduct asset utilization on a continuing basis, tracking particular measures monthly to stay abreast of operating trends.

4.1.7. Understanding the materiality concept

According to the accounting and legal professions, material information is that which affects the decisions made by users of the financial statements in which the information is disclosed.

Determining a material item should include a quantitative and qualitative evaluation of that item. However, significant professional judgment is necessary. In addition to the guidelines below, professionals should be aware of industry-specific practices regarding material disclosures. Sound judgment in applying the materiality concept is the cornerstone of maintaining investor confidence in the financial reports of public companies.

Frequently Asked Questions

Where does a manager get assistance in deciding whether information is material and should be disclosed in the financial statements of an enterprise?

Any manager seeking assistance in applying the materiality concept to accounting or operational information should ask either the firm's public accountant or audit committee for guidance.

What other constraints, besides the materiality concept, are placed upon the collection, synthesis and dissemination of financial information?

One other primary constraint to providing relevant and reliable financial information is the cost-benefit relationship. That is, does the cost of providing the information outweigh its decision-making value? In most cases, it costs very little to include omitted information or correct misstated amounts. However, the costs of collecting, summarizing and disseminating financial information can be exorbitant. The cost-benefit relationship, like the materiality concept, requires judgment on the part of managers and accountants. But both serve to ensure that the financial information is of the highest quality and is appropriately disclosed.

Has the FASB or SEC ever provided general guidance on the concept of materiality?

The SEC's 1993 commissioner, Richard Y. Roberts, stated that the "rule of thumb" in determining materiality was: above 10%—material; less than 10%—may be material, and under 5%—usually not material.

How it works in practice

Defining Materiality

One of the underpinnings of accounting theory is the concept of materiality. Based on the Financial Accounting Standards Board Concepts Statement issued in 1980, accounting information that is disclosed in a business' financial statements must be:

- relevant
- reliable

Providing all relevant and reliable information on a business in its financial statements and footnotes would be costly and imprudent. Therefore, the FASB outlined the concept of materiality as a primary constraint to providing financial information, and defined a material item as "an omission or misstatement of accounting information that in light of surrounding circumstances, makes it probable that the judgment of a reasonable person relying on the information would have been changed or influenced by the inclusion or correction of the item." The Securities and Exchange Commission defines a material matter as one "about which an average prudent investor ought reasonably to be informed."

Background and Origins

Materiality has its origins in English common law. The judge in the 1867 English case, "Central Railway of Venezuela v. Kisch," enunciated the concept by requiring that a prospectus contain no misstatement or "concealment of any material fact."

The U.S. legal community adopted the concept of materiality in the late 1800s and has included it as a fundamental element of financial disclosure ever since.

Quantitative and Qualitative Characteristics

Since both quantitative and qualitative aspects of financial information influence the decision maker, materiality must be judged on both characteristics. In the simplest case, judgments are based on relative size. When the International Accounting Standards Committee published the "Framework for the Preparation and Presentation of Financial Statements," it stated that, "Materiality depends on the size of the item or error judged in the particular circumstances of its omission or misstatement. Thus, materiality provides a threshold or cut-off point rather than being a primary qualitative characteristic which information must have if it is to be useful." The FASB echoed this approach by stating that materiality was " … primarily a quantitative rather than qualitative … " constraint on accounting information. Accordingly, many accountants filter out smaller items, adjustments or disclosures from larger items and errors due to their relative size.

General "rules of thumb" used in practice to determine material items include adjustments, misstatements or omissions that are equal to or exceed:

- five percent (5%) of pre-tax profit
- one-half percent (.5%) of total assets or total revenues
- one percent (1%) of book equity

In almost every case the relative, rather than the absolute, size of an item determines whether it is material in a given situation. For example, an $80,000 error in the write-off of accounts receivable would not be material for a firm with $10 million in pre-tax profit. But that error would certainly be material for a firm with $100,000 of pre-tax profit.

The Degree of Precision in Estimating

The attainable degree of precision in estimating an item is also important in determining materiality. If, for example, there are deviations in the value of a portfolio of marketable securities owned by a firm, any misstatement of the current market value should be relatively small due to the degree of precision involved in the valuation process. On the other hand, if there are contingent liabilities recognized on the balance sheet for potential lawsuits, the deviations in their possible value may be much greater due to the imprecision inherent in the estimation.

The Nature of an Item

Although a secondary criteria, the nature of an item is also important in determining materiality. If the item makes a difference or influences the decisions of others, it is material, no matter how small. For example, nonrecurring revenues that turn a loss into a profit or reverse a trend of earnings, no matter how small relative to total revenues, are material and should be disclosed in the footnotes to financial statements. Likewise, transactions that affect compliance with regulatory statutes or loan covenants are material to the readers and should be disclosed.

Using Judgment

In 1999, the SEC issued its formal position on the proper application of the materiality concept in Staff Accounting Bulletin No. 99. The document expresses the SEC's view that items should not be considered immaterial, just because they do not meet certain quantitative thresholds. It also addresses concerns about the practice of earnings management. By manipulating reported earnings using aggressive accounting practices, management can alter a company's true financial performance to meet Wall Street's expected results. At the center of these practices is the misapplication of the materiality concept. For example, the federal suit filed by the SEC against W. R. Grace & Co. in 1998 claimed that Grace managed to smooth the earnings of its National Medical Care unit by using reserve accounts to store earnings in good years and to prop up poor earnings in lean years. Grace's auditors proposed adjustments to earnings during the years affected, but management refused to book the adjustments. The auditors then used a liberal standard of materiality to waive the adjustments and issue a non-qualified opinion.

Even with the recent guidance by the major authorities on financial reporting, accountants and auditors still must use their professional judgment to determine if an item is material. The FASB acknowledges that only those who have all the facts can properly make materiality judgments. If in doubt, a professional must ask, "Is this information, error or misstatement important or large enough to influence the decisions of the user?" An affirmative answer requires that it be disclosed in some manner in the financial report of the business.

Common Mistakes

The Tendency to Omit Qualitative Information

One common mistake in determining a material item is the tendency to exclude information that has a relatively small financial impact, but is qualitatively material. The SEC has outlined several qualitative factors that can cause small errors to become material. They include evaluation of errors that:

- arise from an item capable of precise measurement;
- mask a change in earnings or other trends;
- hide a failure to meet analysts' consensus expectations for the enterprise;
- change a loss into income or vice versa;
- affect compliance with regulatory requirements, loan covenants, or other contractual obligations;
- have the effect of increasing management's performance-based compensation;
- involve concealment of illegal acts or unlawful transactions.

Management should use these examples as a checklist to assess qualitative materiality.

Muddying the Waters with Multiple Misstatements

Another failure by managers to identify material misstatements occurs when multiple misstatements are involved. Because the net effect of all misstatements may be to diminish the impact of one, managers are inclined not to disclose them individually. The accounting literature requires that misstatements be judged separately and in the aggregate to determine their materiality.

4.1.8. Understanding financial performance

Financial reporting provides present and potential users with important information to make investment, credit and other decisions about an enterprise. It occurs on a periodic basis—quarterly for public companies and annually for private enterprises—and requires management to prepare a balance sheet, income statement, statement of cash flow, and accompanying footnotes.

Financial statements are usually prepared on an accrual basis, in compliance with Generally Accepted Accounting Principles (GAAP). The footnotes to the statements divulge information to investors that is not obvious from reviewing the financial statements, or is qualitative in nature.

Most businesses engage public accountants to audit their annual financial statements. Once an audit is performed, the public accountant renders an opinion on the accuracy of the financial statements in reflecting actual performance. If the audit opinion is included with financial statements, it should be read to determine if there is additional information disclosed that would influence investor decisions.

Frequently Asked Questions

Are there any additional disclosures or analyses featured in reporting financial performance other than financial statements and their accompanying footnotes?

Public companies registered with the Securities and Exchange Commission (SEC) are required to provide a management discussion and analysis (MD&A) section in their 10-Q (quarterly report) and 10-K (annual report) filings. The MD&A provides information to the reader that management believes is useful in understanding the company's operating results, cash flows, and financial condition. The section contains forward-looking information and statements that reflect management's current expectations, assumptions and estimates of future performance and economic conditions.

How and when is financial performance reported?

Private companies typically have audited financial statements completed within 90 to 120 days following the end of their fiscal year. The timing and method of distribution is usually governed by shareholder agreements, loan covenants or bank credit facility agreements. For publicly traded companies, the annual report must be filed with the SEC within 90 days of the end of the fiscal year, while quarterly reports are due within 45 days of the close of the quarter. All financial statements are filed electronically with the SEC, while shareholders have the option of receiving a hard copy or downloading one from the company's Web site. As a legal requirement, publicly traded companies must file their annual report at the Registrar of Companies within seven months of the end of the fiscal year. The Stock Exchange requirement, which is not a legal requirement, is within 90 days. Half-yearly, or interim reports are published within 90 days of the close of the half-year, as required by the Stock Exchange although, again, this is not a legal requirement.

What specific types of disclosures are made in the footnotes to the financial statements?

Specific disclosures typically covered in the footnotes to the financial statements include details on accounting policies, contingencies, depreciation practices, lease agreements, loan obligations, pension and post-retirement liabilities, related party transactions, research and development costs, derivative financial instruments held or issued, inventories and subsequent events. These are only the more common items. For an exhaustive list of possible footnote disclosures, go the Financial Accounting Standards Board (FASB) Web site.

How it works in practice

Define the Objectives

There are four objectives of financial reporting.

- It should provide information that is useful to present and potential users in making rational investment, credit, and similar decisions.
- It should be comprehensible to those who have reasonable knowledge of business and are willing to review the information with some degree of diligence.
- It should provide information to help present and potential investors, creditors, and other users in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest, and from the sale or maturity of securities.
- It should provide information about the economic resources of an enterprise, the claims to those resources, and the effects of transactions, events and circumstances that change its resources and claims to those resources.

All of these objectives serve the purpose of providing information about a firm's financial performance during a period and about management's effectiveness in discharging its stewardship responsibility to owners.

The Components of a Financial Report

Financial results are typically communicated using four components—three financial statements and affiliated footnotes. Specifically, a financial report typically contains:

- the statements of financial position
- income to the business
- cash flows from the business
- notes to the financial statements

The first two statements are commonly referred to as the balance sheet and income statement or profit and loss account, respectively.

The Information Contained in Each Component

For an enterprise that has several individual business segments that are accounted for separately, the financial statements presented to shareholders and other outside parties represent the consolidated results of the business. Unless the business is in its first year of operation, the financial statements are typically prepared on a comparative basis. That is, at least two years of financial results are displayed in each quarterly or annual report.

The balance sheet lists the assets owned, liabilities owed and owner's equity as of a specific date. It is a snapshot of the financial position of the company as of a reporting date, and discloses the level of liquidity, financial leverage, and net assets to users. The income statement summarizes a firm's profitability by disclosing its revenues and expenses during a specific reporting period. Comparing balance sheets from the beginning to the end of a reporting period reflects the net changes in assets, liabilities, and owner's equity. The income statement for the same period shows the reader why they changed.

In order to help investors and creditors assess current and future cash returns on their capital investments, a business reports the cash inflows and outflows during a reporting period. The statement of cash flows discloses the receipts and payments of cash from operating, investment and financing activities. By tracking the changes in the amount of cash generated or used by the business during a reporting period, the statement reconciles the change in the firm's cash on the balance sheet from one reporting period to the next.

Critical information that is summarized in the aforementioned financial statements, but not separately identified or that is qualitatively important to explaining the financial performance of an enterprise, is disclosed in footnotes. Footnotes, although sometimes highly technical, are means of amplifying or explaining material items. Restrictions imposed by financing arrangements, significant terms of contractual agreements, and explanatory supplemental data are examples of footnote content. Investors and equity analysts comb the footnotes of the financial statements to distill information and get an insight into complex business transactions and their future effects.

Consistency between Companies

Companies typically use the accrual method of accounting to report all financial results based on Generally Accepted Accounting Principles (GAAP). The common use of GAAP ensures consistency in financial reporting between two different accounting periods. It also enables comparability of financial performance between different businesses in the same industry during a specific accounting period.

Finally, companies that report financial performance to investors, shareholders, and other third parties are typically required by those parties to have an independent audit of their financial statements, including the footnote disclosures. All publicly registered companies are required by the SEC to have an annual audit of their financial statements. Public accounting firms perform these independent examinations to ensure that there are no material misstatements or errors in financial statements published by the enterprise. The opinion rendered by the public accountants regarding the accuracy of the financial statements is usually included in the financial reports. If the business has not accurately represented the financial results in its statements, is facing a significant contingency or there is some doubt about its ability to continue as a going concern, the accountants' opinion will reflect these facts. It is always important to read the auditor's opinion if it accompanies the financial statements.

Common Mistakes

Not Making the Report Suitable for the Intended User

In reporting the financial performance of an organization, management must keep in mind the needs of the user. There are standard financial statements to which all external parties typically expect to have access. However, there are also specific industry practices that mandate certain supplemental disclosures, statutory reporting requirements or styles of presenting financial information. To communicate performance effectively, the financial report should meet all of the applicable accounting standards and industry nuances, but most importantly, it must have utility to its intended audience.

4.1.9. Understanding leases

Leases can help improve a company's financial picture, perhaps dramatically. For instance, they may help an enterprise reduce spending on capital equipment—especially for items that may be quickly rendered obsolete by advances in technology—and allocate funds for other business purposes. Leasing also can deliver significant tax benefits, because leased assets are subject to different and more advantageous tax treatment. Leases are not panaceas, however, and need careful consideration.

How They Work in Practice

In an operating lease, an entity or individual uses an asset owned by someone else for a period that is much shorter than the asset's useful economic life, and makes regularly scheduled payments to the asset's owner for its use. These payments are treated as a rental expenses.

A capital lease is a non-cancelable contract to pay regularly for the use of—and the full price of—an asset over a specific period of time. Capital leases are typically complex agreements with major tax implications. They also transfer substantially all the benefits and risks inherent in ownership of the property to the lessee. In turn, financial standards bodies hold that capital leases are to be recorded as an asset.

In addition, the U.S. Financial Accounting Standards Board has ruled a lease should be treated as an capital lease if it meets any one of these four conditions:

- The lease life equal or exceeds 75% of the life of the asset.
- There is a transfer of ownership to the lessee at the end of the lease term.
- There is an option to purchase the asset at a "bargain price" at the end of the lease term, or to renew the lease for a nominal or "bargain" rental.
- The present value of the lease payments, discounted at an appropriate discount rate, exceeds 90% of the fair market value of the asset.

One oft-used form of capital lease is known as a lease back or sale and lease back: The owner of an asset (or property) sells it to another party, provide that the purchaser leases the assets back to the original owner for an agreed-upon rent over a set term. This arrangement enables the original owner to both raise capital for other purposes and gain tax benefits.

A leveraged lease involves three parties: the firm using the equipment (lessee); the firm that owns the equipment (lessor), and the firm that supplies most of the funds used for acquiring the specific asset being leased (lender).

All leases cover specified periods, with specified payment due monthly, quarterly or annually. Because capital leases are far longer, they may be subject to review every five years.

To assess a firm's ability to meet lease payments, analysts apply the fixed charge cover ratio. A high figure is desirable. Its formula is:

EBIT + Lease Expenses / Interest + Lease Expenses

Common Mistakes

- Whether leases are operating or capital, lease payments are no different than interest payments on debt, and must be viewed in a similar light. If a firm is allowed to lease a significant portion of its assets and keep them off its balance sheet, a very misleading view of that firm's financial strength may result. Consequently, accounting rules have been devised to force firms to reveal the extent of their lease obligations on their books.
- Operating leases should appear as notes to a company's balance sheet, to disclose the annual amount of minimum rental payments. There is nothing improper about reporting them this way, but one needs to be mindful. A retailer, for example, once disclosed that it had $4.6 billion in minimum, non-cancelable, operating lease commitments.

- Leasing is often faster than purchasing, but often winds up being more expensive in the long run. How much more can be determined by comparing respective costs using net-present-value calculations.
- The interest cost on leasing is likely to be higher than the interest cost on debt.
- Leverage lease debt is non-recourse borrowing by the lessor. In case of default, the third-party lender must obtain repayment of the debt from the lessee, not from the lessor.

4.1.10. How to adjust financial statements (revenue recognition)

WHEN TO RECOGNISE REVENUE

There are two methods of accounting for revenues—cash basis and accrual basis. Under the cash basis, revenues are simply recognized as cash is received. Companies using the accrual basis of accounting have an entire body of professional pronouncements that outline the techniques and timing of revenue recognition.

Frequently Asked Questions

Why is it difficult to determine when to recognize revenues?

There are a variety of ways to sell and market products and services. Although the accounting literature provides guidance for the most common types of sales transactions, it is impossible to address all specific situations. As a result, a significant amount of professional judgment is still involved in many complex sales transactions.

What organizations provide formal guidance to professionals regarding recognizing revenues?

The Financial Accounting Standards Board, an independent, private-sector organization, promulgates Generally Accepted Accounting Principles (GAAP) for recognizing revenues. The American Institute of Certified Public Accountants (AICPA) also provides guidance through its statements of position, and the Securities and Exchange Commission provides authoritative reference for publicly-traded companies.

How are revenues generated by nonoperating activities recognized and reflected in the financial results of the enterprise?

Revenues generated by nonoperating activities, such as rental income from a sublease or the sale of an old computer to an employee, follow the same recognition criteria that are used for operating revenues. However, nonoperating revenues are not reported as revenues to the firm, but alternatively, as a reduction in a corresponding expense (such as rent expense) or as “other income” on the statement of income.

How it works in practice

There Are Many Ways a Business Can Recognize Revenue from the Sale of Its Products and Services

Depending on the basis of accounting, the type of products or services sold and industry practice, revenues can be recognized at the point of production, as services are being performed, at the point of sale or at the point of customer payment. In a typical sale transaction, revenues are commonly recognized at the time the product or service is delivered to the customer. At that instant, the benefits and risks of ownership are typically transferred to a creditworthy purchaser for a fixed price. However, for every firm that recognizes revenue using this simple method, there is another that recognizes revenue differently.

Determining the Point At Which Revenue Should Be Recognized for a Particular Business

If the firm uses the cash basis of accounting, sales are simply recorded when the cash is received from customers. Firms that use the accrual basis of accounting must recognize revenue at the time when it is realized or realizable and earned. The specific criteria used to determine this moment are that:

- an exchange arrangement exists;
- the product has been delivered, or the service has been performed;
- the seller's price to the customer is fixed and measurable;
- collection of the customer's obligation to pay is reasonably assured.

In the Case of a Return Policy

A clothing retailer, for example, will typically sell merchandise to customers for cash or credit. Ownership of the apparel has transferred; the customer has paid. As long as there is no return policy, the sale is final. However, most clothing retailers provide a return policy for defective or unwanted garments. Therefore, the risk of continued ownership exists and must be factored into the seller's recognition of the sale. There are three practices commonly used to deal with product returns. They are:

1. to defer the recognition of the sale until the return privilege expires;
2. to recognize all sales, but reduce them by an amount of expected returns;
3. to recognize all sales, and reduce sales as the merchandise is returned.

The reduction of sales revenue for customer returns is typically reported as "net sales" on the statement of income.

When There's a Ready Market At a Pre-determined Sales Price

When there is a ready market for a product at a determinable sales price and distribution costs are insignificant, revenues can be recognized at the time of production. Mining companies and large farming operations typically recognize revenues at the time precious metals are recovered and agricultural crops are harvested, respectively. These represent commodities that have been, or will inevitably be, bought at the market spot price by large, institutional customers.

In the Case of Long-term Contracts

Revenues earned on certain long-term contracts, where the buyer has the legal right to specific performance and the seller has the right to progress payments, can be recognized as progress is made toward completion. This form of contract has terms that extend beyond a year and is common in the construction, consulting and military contracting industries. By breaking the entire contract into specific milestones, revenues are recognized at stages of completion and matched with the effort and costs associated with that particular stage.

One of the more common methods of recognizing revenue in the construction industry is the percentage-of-completion basis. Generally, the stage of completion is based on the percentage of costs incurred through a particular date, to total estimated costs. The same proportionate level is used at that date to match project expenses properly with revenues earned. Many consulting firms use the same methodology, except that progress is based on the number of consulting hours expended in a period, compared to the total number of hours required to complete the project. These approaches are necessary when projects extend beyond one accounting period. They enable revenues to be earned in installments as services are rendered, progress payments are made, and costs are incurred.

In the Case of Loaning out Assets

Revenues received for allowing others to use certain tangible and intangible assets, such as renting building space or office equipment, loaning money, or selling copyrighted materials, should be recognized as time passes or assets are used. This is in keeping with the notion that an exchange transaction has occurred.

In the Case of Credit Arrangements

A final consideration before recognizing revenues is the certainty of collection on credit sales. When sales are made to customers via trade receivables or short-term credit, the sale is typically recognized in full at the point the product is delivered or the service is performed. If, in the seller's past experience, a small percentage of accounts receivable are not collectable, a provision for bad debt expense is established and charged against sales revenues in that period.

However, sales to customers on credit which require several large installments over an extended period of time, expose the seller to greater collection risk than do ordinary sales transactions. These sales are typically structured as conditional sales contracts, providing transfer of title to the property after all payments have been made, or as notes secured by the underlying property purchased. In either case, failure by the customer to make the payments results in repossession of the property by the seller. This is typical in the farm equipment and home furnishings businesses, where sales of large-ticket items require the buyer to make periodic payments over a period of years. The concept of conservatism is employed in the recognition of these sales, to protect the seller from large write-offs of uncollectable amounts. Specifically, the installment sales or cost recovery methods are used to record these sales. Under the installment sales method, gross profit from the sale is deferred until cash payments are received from the customer. The cost recovery method recognizes no gross profit on the sale until enough cash is collected from the customer to cover the cost of delivering the product. Once the direct costs of the sale have been covered, gross profit is then recognized as subsequent payments are made.

Common Mistakes

Recognizing Revenues before They Are Earned and Realizable

There are enormous pressures on management to meet planned revenue targets, manifested in investors' expectations, management compensation plans based on company growth and competitive performance in the marketplace. So there is a strong tendency to recognize revenues before they are earned and realizable. By being over-aggressive in recognizing revenues, managers expose themselves to the possibility of lawsuits by shareholders, vendors and/or credit providers. To avoid this pitfall, review the types of sales transactions encountered in the normal course of business and the methodologies used to recognize revenue for each with a certified public accountant, or the company's auditors. If questions still remain, review the revenue recognition policies with the company's audit committee.

Using the Wrong Method

There are times when there is more than one acceptable method to recognize revenue for a given sales transaction. When in doubt about which method is best, a manager should review the practices employed within the company's industry. The method most commonly used by competitors for similar transactions should be adopted. This ensures comparability of the firm's results with those of its peers, and consistent accounting treatment in recognizing revenue over time.

4.3. The concept of FV, PV, NPV, DCF

4.3.1. Future Value

Future Value is the amount of money that an investment made today (the present value) will grow to by some future date. Since money has time value, we naturally expect the future value to be greater than the present value. The difference between the two depends on the number of compounding periods involved and the going interest rate.

The relationship between the future value and present value can be expressed as:

$$FV = PV (1 + i)^n$$

Where:

FV = Future Value

PV = Present Value
i = Interest Rate Per Period
n = Number of Compounding Periods

Example: You can afford to put $10,000 in a savings account today that pays 6% interest compounded annually. How much will you have 5 years from now if you make no withdrawals?

PV = 10,000
i = .06
n = 5

FV = 10,000 (1 + .06)^5 = 10,000 (1.3382255776) = 13,382.26

End of Year	**1**	**2**	**3**	**4**	**5**
Principal	10,000.00	10,600.00	11,236.00	11,910.16	12,624.77
Interest	600.00	636.00	674.16	714.61	757.49
Total	**10,600.00**	**11,236.00**	**11,910.16**	**12,624.77**	**13,382.26**

Example 2: Another financial institution offers to pay 6% compounded **semiannually**. How much will your $10,000 grow to in five years at this rate?

Interest is compounded twice per year so you must **divide the annual interest rate by two** to obtain a rate per period of 3%. Since there are two compounding periods per year, you must **multiply the number of years by two** to obtain the total number of periods.

PV = 10,000
i = .06 / 2 = .03
n = 5 * 2 = 10

FV = 10,000 (1 + .03)^{10} = 10,000 (1.343916379) = 13,439.16

4.3.2. Present Value

The Present Value represents the current value of a future cash payment, discounted at an estimated interest rate, over a period of time, usually a number of years.

According to the time value of money theory, money received now is worth more than money received later. One reason for this is inflation; the other is an investor's ability to invest money in hand and increase its value. Understanding present value helps organizations and individuals to analyze more accurately the true long-term value of expected receipts and, as a result, to plan more precisely for the future.

How It Works in Practice

Calculating present value is considerably easier with a present value table, which expresses the value of a unit of currency over time at a given interest rate, or at the discount rate. Tables usually list periods of up to 25 or 30 years and five-year increments thereafter, perhaps up to 50 years. To determine present value, multiply the sum of money by the corresponding figure in the table.

The table is derived from a formula:

$1 / (1 + i)n$

where i the applicable interest rate expressed as a decimal, and n is the number of years in question.

After one year at 4%, for instance, one dollar shrinks to $0.962, i.e. $1 divided by 1.04. After two years at that same 4% rate, a dollar is worth $0.925, or $1/(1 + .04)2.

If you expect to receive a payment of $20,000 in six years, and the anticipated rate of inflation over that period of time is 4%, what is the value of the sum in current dollars?

The present value table figure for 4% over six years is .790; multiplying $20,000 by .790 produces a present value of $15,800.

Many computer spreadsheet programs now incorporate calculators that can compute present value automatically, provided the correct figures are inserted.

Other Practical Considerations

- Like all time value of money calculations, present value is derived from assumptions-about interest rates and inflation, for example. If these factors are dramatically different from expectations, present value will be also.
- A present value table is different from an annuity table or a future value table. Make sure that the right one is being used.
- Complicated calculations involving varying interest rates compounded daily are not for the novice. Once the principle of present value is understood, it is best to leave detailed computations to the experts.

4.3.3. Determining net present value

Net Present Value represents the projected profitability of an investment, based on anticipated cash flows and discounted at a stated rate of interest.

Net present value helps management or potential investors weigh the wisdom of an investment—in new equipment, a new facility, or other type of asset—by enabling them to

quantify the expected benefits. Those evaluating more than one potential investment can compare the respective projected returns to find the most attractive project.

A positive NPV indicates that the project should be profitable, assuming that the estimated cash flows are reasonably accurate. A negative NPV, of course, indicates that the project will probably be unprofitable and therefore should be adjusted, if not abandoned altogether.

Equally significantly, NPV enables a management to consider the time value of money it will invest. This concept holds that the value of money increases with time because it can always earn interest in a savings account. Therefore, any other investment of that money must be weighed against how the funds would perform if simply deposited and saved.

When the time value of money concept is incorporated in the calculation of NPV, the value of a project's future net cash receipts in "today's money" can be determined. This enables proper comparisons between different projects.

How It Works in Practice

Let's say that Global Manufacturing, Inc. is considering the acquisition of a new machine. First, its management would consider all the factors: initial purchase and installation costs; additional revenues generated by sales of the new machine's products, plus the taxes on these new revenues. Having accounted for these factors in its calculations, the cash flows that Global Manufacturing projects will generate from the new machine are:

Year 1:	-100,000 (initial cost of investment)
Year 2:	30,000
Year 3:	40,000
Year 4:	40,000
Year 5:	35,000
Net Total:	145,000

At first glance, it appears that cash flows total a whopping 45% more than the $100,000 initial cost, a strikingly sound investment indeed.

Alas, it's not that simple. But time value of money shrinks return on the project considerably, since future dollars are worth less than present dollars in hand. NPV accounts for these differences with the help of present value tables. These user-friendly tables, readily available on the Internet and in references, list the ratios that express the present value of expected cash flow dollars, based on the applicable interest rate and the number of years in question.

In our example, Global Manufacturing's cost of capital is 9%. Using this figure to find the corresponding ratios on the present value table, the $100,000 investment cost, expected annual revenues during the five years in question, the NPV calculation looks like this:

Year	*Cash flow*	*Table factor (at 9%)*	*Present value*
1	($100,000) x	1.000000 =	($100,000)
2	$ 30,000 x	0.917431 =	$27,522.93
3	$ 40,000 x	0.841680 =	$33,667.20

4	$ 40,000 x	0.772183 =	$30,887.32
5	$ 35,000 x	0.708425 =	$24,794.88
	NPV =		$16,873.33

NPV is still positive. So, on this basis at least, the investment should proceed.

Other Practical Considerations

- Beware of assumptions. Interest rates change, of course, which can affect NPV dramatically. Moreover, fresh revenues (as well as new markets) may not grow as projected. If the cash flows in years 2-5 of our example fall by $5,000 a year, for instance, NPV shrinks to $5,260.89, which is still positive but less attractive.
- NPV calculations are performed only with cash receipts payments and discounting factors. In turn, NPV is a tool, not the tool. It ignores other accounting data, intangibles, sheer faith in a new idea, and other factors that may make an investment worth pursuing despite a negative NPV.
- It is important to determine a company's cost of capital accurately.

4.3.4. Future Value of Annuities

An **annuity** is a series of equal payments or receipts that occur at evenly spaced intervals. Leases and rental payments are examples. The payments or receipts occur at the **end** of each period for an **ordinary annuity** while they occur at the **beginning** of each period.for an **annuity due**.

Future Value of an Ordinary Annuity

The **Future Value of an Ordinary Annuity** (FVoa) is the value that a stream of expected or promised future payments will grow to after a given number of periods at a specific compounded interest.

The Future Value of an Ordinary Annuity could be solved by calculating the future value of each individual payment in the series using the future value formula and then summing the results. A more direct formula is:

$$\mathbf{FVoa = PMT\ [((1 + i)^n - 1) / i]}$$

Where:

FVoa = Future Value of an Ordinary Annuity
PMT = Amount of each payment
i = Interest Rate Per Period
n = Number of Periods

Example: What amount will accumulate if we deposit $5,000 at the **end** of each year for the next 5 years? Assume an interest of 6% compounded annually.

PV = 5,000
i = .06
n = 5

FVoa = 5,000 [(1.3382255776 - 1) /.06] = 5,000 (5.637092) = 28,185.46

Year	1	2	3	4	5
Begin	0	5,000.00	10,300.00	15,918.00	21,873.08
Interest	0	300.00	618.00	955.08	1,312.38
Deposit	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
End	**5,000.00**	**10,300.00**	**15,918.00**	**21,873.08**	**28,185.46**

Example 2: In practical problems, you may need to calculate both the future value of an annuity (a stream of future periodic payments) and the future value of a single amount that you have today:

For example, you are 40 years old and have accumulated $50,000 in your savings account. You can add $100 at the **end** of each month to your account which pays an interest rate of 6% per year. Will you have enough money to retire in 20 years?

You can treat this as the sum of two separate calculations:

1. the future value of 240 monthly payments of $100 **Plus**
2. the future value of the $50,000 now in your account.

PMT = $100 per period
i = .06 /12 = .005 Interest per period (6% annual rate / 12 payments per year)
n = 240 periods

FVoa = 100 [(3.3102 - 1) /.005] = 46,204

PV = 50,000 Present value (the amount you have today)
i = .005 Interest per period
n = 240 Number of periods

FV = PV $(1+i)^{240}$ = 50,000 $(1.005)^{240}$ = 165,510.22

After 20 years you will have accumulated $211,714.22 (46,204.00 + 165,510.22).

Future Value of an Annuity Due (FVad)

The **Future Value of an Annuity Due** is identical to an ordinary annuity except that each payment occurs at the beginning of a period rather than at the end. Since each payment occurs one period earlier, we can calculate the present value of an **ordinary annuity** and then multiply the result by (1 + i).

$$\mathbf{FVad = FVoa\ (1+i)}$$

Where:

FVad = Future Value of an Annuity Due
FVoa = Future Value of an Ordinary Annuity
i = Interest Rate Per Period

Example: What amount will accumulate if we deposit $5,000 at the **beginning** of each year for the next 5 years? Assume an interest of 6% compounded annually.

PV = 5,000
i = .06
n = 5

FVoa = 28,185.46 (1.06) = 29,876.59

Year	**1**	**2**	**3**	**4**	**5**
Begin	0	5,300.00	10,918.00	16,873.08	23,185.46
Deposit	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
Interest	300.00	618.00	955.08	1,312.38	1,691.13
End	**5,300.00**	**10,918.00**	**16,873.08**	**23,185.46**	**29,876.59**

4.4. How to determine rates

This section comprises information on how different rate of returns, capitalization rates are being determined and used in business valuation by appraisers.

4.4.1. Return On Assets

What It Measures

A company's profitability, expressed as a percentage of its total assets.

Return on assets measures how effectively a company has used the total assets at its disposal to generate earnings. Because the ROA formula reflects total revenue, total cost, and assets deployed, the ratio itself reflects a management's ability to generate income during the course of a given period, usually a year.

Naturally, the higher the return the better the profit performance. ROA is a convenient way of comparing a company's performance with that of its competitors, although the items on which the comparison is based may not always be identical.

How It Works in Practice

To calculate ROA, divide a company's net income by its total assets, then multiply by 100 to express the figure as a percentage:

Net income / total assets × 100 = ROA

If net income is $30, and total assets are $420, the ROA is:

30 / 420 = 0.0714 × 100 = 7.14 %

A variation of this formula can be used to calculate return on net assets (RONA):

Net income / fixed assets + working capital = RONA

And, on occasion, the formula will separate after-tax interest expense from net income:

Net income + interest expense / total assets = ROA

It is therefore important to understand what each component of the formula actually represents.

Other Practical Considerations

- Some experts recommend using the net income value at the end of the given period, and the assets value from beginning of the period or an average value taken over the complete period, rather than an end-of-the-period value; otherwise, the calculation will include assets that have accumulated during the year, which can be misleading.
- While a high ratio indicates a greater return, it must still be balanced against such factors as risk, sustainability, and reinvestment in the business through development costs. Some managements will sacrifice the long-term interests of investors in order to achieve an impressive ROA in the short term.

- A climbing return on assets usually indicates a climbing stock price, because it tells investors that a management is skilled at generating profits from the resources that a business owns.
- Acceptable ROAs vary by sector. In banking, for example, an ROA of 1% or better is a considered to be the standard benchmark of superior performance.
- ROA is an effective way of measuring the efficiency of manufacturers, but can be suspect when measuring service firms, or companies whose primary assets are people.
- Other variations of the ROA formula do exist.

4.4.2. Return On Investment

What It Measures

In the financial realm, the overall profit or loss on an investment expressed as a percentage of the total amount invested or total funds appearing on a company's balance sheet.

Like return on assets or return on equity, return on investment measures a company's profitability and its management's ability to generate profits from the funds investors have placed at its disposal.

One opinion holds that if a company's operations cannot generate net earnings at a rate that exceeds the cost of borrowing funds from financial markets, the future of that company is grim.

How It Works in Practice

The most basic expression of ROI can be found by dividing a company's net profit (also called net earnings) by the total investment (total debt plus total equity), then multiplying by 100 to arrive at a percentage:

Net profit / Total investment x 100 = ROI

If, say, net profit is $30 and total investment is $250, the ROI is:

30 / 250 = 0.12 x 100 = 12 %

A more complex variation of ROI is an equation known as the Du Pont formula:

(Net profit after taxes / Total assets) = (Net profit after taxes / Sales) x Sales / Total assets

If, for example, net profit after taxes is $30, total assets are $250, and sales are $500, then:

30 / 250 = 30 / 500 x 500 / 250 =

12% = 6% x 2 = 12%

Champions of this formula, which was developed by the Du Pont Company in the 1920s, say that it helps reveal how a company has both deployed its assets and controlled its costs, and how it can achieve the same percentage return in different ways.

For shareholders, the variation of the basic ROI formula used by investors is:

Net income + (current value - original value) / original value x 100 = ROI

If, for example, somebody invests $5,000 in a company and a year later has earned $100 in dividends, while the value of the shares is $5,200, the return on investment would be:

100 + (5,200 - 5,000) / 5,000 x 100

(100 + 200) / 5,000 x 100 =

300 / 5,000 = 0.06 x 100 = 6% ROI

Other Practical Considerations

- Securities investors can use yet another ROI formula: net income divided by common stock and preferred stock equity plus long-term debt.
- It is vital to understand exactly what a return on investment measures, for example assets, equity, or sales. Without this understanding, comparisons may be misleading or suspect. A search for "return on investment" on the Web, for example, harvests everything from staff training to e-commerce to advertising and promotions!
- Be sure to establish whether the net profit figure used is before or after provision for taxes. This is important for making ROI comparisons accurate.

4.4.3. Return On Sales

What It Measures

A company's operating profit or loss as a percentage of total sales for a given period, typically a year.

ROS shows how efficiently management uses the sales dollar, thus reflecting its ability to manage costs and overhead and operate efficiently. It also indicates a firm's ability to withstand adverse conditions such as falling prices, rising costs, or declining sales. The higher the figure, the better a company is able to endure price wars and falling prices.

Return on sales can be useful in assessing the annual performances of cyclical companies that may have no earnings during particular months, and of firms whose business requires a huge capital investment and thus incurs substantial amounts of depreciation.

How It Works in Practice

The calculation is very basic:

Operating profit / total sales × 100 = Percentage return on sales

So, if a company earns $30 on sales of $400, its return on sales is:

30 / 400 = 0.075 × 100 = 7.5%

Other Practical Considerations

- While easy to grasp, return on sales has its limits, since it sheds no light on the overall cost of sales or the four factors that contribute to it: materials, labor, production overhead, and administrative and selling overhead.
- Some calculations use operating profit before subtracting interest and taxes; others use after-tax income. Either figure is acceptable as long as ROS comparisons are consistent. Obviously, using income before interest and taxes will produce a higher ratio.
- The ratio's operating profit figure may also include special allowances and extraordinary non-recurring items, which, in turn, can inflate the percentage and be misleading.
- The ratio varies widely by industry. The supermarket business, for example, is heavily dependent on volume and usually has a low return on sales.
- Return on sales remains of special importance to retail sales organizations, which can compare their respective ratios with those of competitors and industry norms.

4.4.4. Return On Shareholders Equity

What It Measures

Profitability, specifically the percentage return that was delivered to a company's owners.

ROE is a fundamental indication of a company's ability to increase its earnings per share and thus the quality of its stock, because it reveals how well a company is using its money to generate additional earnings.

It is a relatively straightforward benchmark, easy to calculate, and is applicable to a majority of industries. ROE allows investors to compare a company's use of their equity with other investments, and to compare the performance of companies in the same industry. ROE can also help to evaluate trends in a business.

Businesses that generate high returns on equity are businesses that pay off their shareholders handsomely and create substantial assets for each dollar invested.

How It Works in Practice

To calculate ROE, divide the net income shown on the income statement (usually of the past year) by shareholders' equity, which appears on the balance sheet:

Net income / owners' equity × 100% = return on equity

For example, if net income is $450 and equity is $2,500, then:

450 / 2,500 = 0.18 × 100% = 18 % return on equity

Other Practical Considerations

- Because new variations of the ROE ratio do appear, it is important to know how the figure is calculated.
- Return on equity for most companies certainly should be in the double digits; investors often look for 15% or higher, while a return of 20% or more is considered excellent.
- Seasoned investors also review five-year average ROE, to gauge consistency.
- A word of caution: financial statements usually report assets at book value, which is the purchase price minus depreciation; they do not show replacement costs. A business with older assets should show higher rates of ROE than a business with newer assets.
- Examining ROE with return on assets can indicate if a company is debt-heavy. If a company owes very little debt, then it is reasonable to assume that its management is earning high profits and/or using assets effectively.
- A high ROE also could be due to leverage (a method of corporate funding in which a higher proportion of funds is raised through borrowing than share issue). If liabilities are high the balance sheet will reveal it, hence the need to review it.

4.4.5. Internal Rate Of Return

What It Measures

Technically, the interest rate that makes the present value of an investment's projected cash flows equal to the cost of the project; practically speaking, the rate that indicates whether or not an investment is worth pursuing.

The calculation of internal rate of return is used to appraise the prospective viability of investments and capital projects. It is also called dollar-weighted rate of return.

Essentially, IRR allows an investor to find the interest rate that is equivalent to the monetary returns expected from the project. Once that rate is determined, it can be compared to the rates that could be earned by investing the money elsewhere, or to the weighted cost of capital. IRR also accounts for the time value of money.

How It Works in Practice

How is IRR applied? Assume, for example, that a project under consideration costs $7,500 and is expected to return $2,000 per year for five years, or $10,000. The IRR calculated for the project would be about 10%. If the cost of borrowing money for the project, or the return on investing the funds elsewhere, is less than 10%, the project is probably worthwhile. If the alternate use of the money will return 10% or more, the project should be rejected, since from a financial perspective it will break even at best.

Typically, management requires an IRR equal to or higher than the cost of capital, depending on relative risk and other factors.

The best way to compute an IRR is by using a spreadsheet (such as Excel) or financial calculator, which do it automatically, although it is crucial to understand how the calculation should be structured. Calculating IRR by hand is tedious and time-consuming, and requires the process to be repeated to run sensitivities.

If using Excel, for example, select the IRR function. This requires the annual cash flows to be set out in columns and the first part of the IRR formula requires the cell reference range of these cash flows to be entered. Then a guess of the IRR is required. The default is 10%, written 0.1.

If a project has the following expected cash flows, then guessing IRR at 30% returns an accurate IRR of 27%, indicating that if the next best way of investing the money gives a return of -20%, the project should go ahead.

Now	-2,500
Year 1	1,200
Year 2	1,300
Year 3	1,500

Other Practical Considerations

- IRR analysis is generally used to evaluate a project's cash flows rather than income, because, unlike income, cash flows do not reflect depreciation and therefore are usually more instructive to appraise.
- Most basic spreadsheet functions apply to cash flows only.
- As well as advocates, IRR has critics who dismiss it as misleading, especially as significant costs will occur late in the project. The rule of thumb "the higher the IRR the better" does not always apply.

For the most thorough analysis of a project's investment potential, some experts urge using both IRR and net present value calculations, and comparing their results.

4.4.6. Developing A Capital Asset Pricing Model

What It Measures

The relationship between the risk and expected return of a security or stock portfolio.

The capital asset pricing model's importance is twofold.

First, it serves as a model for pricing the risk in all securities, and thus helps investors evaluate and measure portfolio risk and the returns they can anticipate for taking such risks.

Secondly, the theory behind the formula also has fueled—some might say provoked—spirited analysis among economists about the nature of investment risk itself. The CAPM model attempts to describe how the market values investments with expected returns.

The CAPM theory classifies risk as being either diversifiable, which can be avoided by sound investing, or systematic, that is, not diversified and unavoidable due to the nature of the market itself. The theory contends that investors are rewarded only for assuming systematic risk, because they can mitigate diversifiable risk by building a portfolio of both risky stocks and sound ones.

One analysis has characterized the CAPM as "a theory of equilibrium" that links higher expected returns in strong markets with the greater risk of suffering heavy losses in weak markets. Otherwise, no one would invest in high-risk stocks.

How It Works in Practice

CAPM holds that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat a theoretical required return, the investment should not be undertaken. The formula used to create CAPM is:

Risk-free rate + (Market return - Risk-free rate) x Beta value = Expected return

The risk-free rate is the quoted rate on an asset that has virtually no risk. In practice, it is the rate quoted for 90-day U.S. Treasury bills. The market return is the percentage return expected of the overall market, typically a published index such as Standard & Poor's. The beta value is a figure that measures the volatility of a security or portfolio of securities, compared with the market as a whole. A beta of 1, for example, indicates that a security's price will move with the market. A beta greater than 1 indicates higher volatility, while a beta less than 1 indicates less volatility.

Say, for instance, that the current risk-free rate is 4%, and the S&P 500 index is expected to return 11% next year. An investment club is interested in determining next year's return for XYZ Software, Inc., a prospective investment. The club has determined that the company's beta value is 1.8. The overall stock market always has a beta of 1, so XYZ Software's beta of 1.8 signals that it is a more risky investment than the overall market represents. This added risk means that the club should expect a higher rate of return than the 11% for the S&P 500. The CAPM calculation, then, would be:

4% + (11% - 4%) x 1.8 = 16.6% Expected Return

What the results tell the club is that given the risk, XYZ Software, Inc. has a required rate of return of 16.6%, or the minimum return that an investment in XYZ should generate. If the investment club doesn't think that XYZ will produce that kind of return, it should probably consider investing in a different company.

Other Practical Considerations

- As experts warn, CAPM is only a simple calculation built on historical data of market and stock prices. It does not express anything about the company whose stock is being analyzed. For example, renowned investor Warren Buffett has pointed out that if a company making Barbie™ Dolls has the same beta as one making pet rocks, CAPM holds that one investment is as good as the other. Clearly, this is a risky tenet.
- While high returns might be received from stocks with high beta shares, there is no guarantee that their respective CAPM return will be realized (a reason why beta is defined as a "measure of risk" rather than an "indication of high return").
- The beta parameter itself is historical data and may not reflect future results. The data for beta values is typically gathered over several years and experts recommend that only long-term investors should rely on the CAPM formula.
- Over longer periods of time, high beta shares tend to be the worst performers during market declines.

4.4.7. Risk-Adjusted Return

What It Measures

How much an investment returned in relation to the risk that was assumed to attain it.

Being able to compare a high-risk, potentially high-return investment with a low-risk, lower-return investment helps answer a key question that confronts every investor: is it worth the risk?

By itself, the historical average return of an investment, asset, or portfolio can be quite misleading and a faulty indicator of future performance. Risk-adjusted return is a much better barometer.

The calculation also helps reveal whether the returns of the portfolio reflect smart investment decisions, or the assumptions of excess risk that may or may not have been worth what was gained. This is particularly helpful in appraising the performance of money managers.

How It Works in Practice

There are several ways to calculate risk-adjusted return. Each has its strengths and shortcomings. All require particular data, such as an investment's rate of return, the risk-free return rate for a given period (usually the performance of a 90-day U.S. Treasury bill over 36 months), and a market's performance and its standard deviation.

Which one to use? It often depends on an investor's focus, principally whether the focus is on upside gains or downside losses.

Perhaps the most widely used is the *Sharpe ratio*. This measures the potential impact of return volatility on expected return and the amount of return earned per unit of risk. The higher a fund's Sharpe ratio, the better its historical risk-adjusted performance, and the higher the number the greater the return per unit of risk. The formula is:

(Portfolio return – Risk-free return) / Std. deviation of portfolio return = Sharpe ratio

Take, for example, two investments, one returning 54%, the other 26%. At first glance, the higher figure clearly looks like the better choice, but because of its high volatility it has a Sharpe ratio of .279, while the investment with a lower return has a ratio of .910. On a risk-adjusted basis the latter would be the wiser choice.

Meanwhile, the *Treynor ratio* also measures the excess of return per unit of risk. Its formula is:

(Portfolio return – Risk-free return) / Portfolio's beta = Treynor ratio

In this formula (and others that follow), beta is a separately calculated figure that describes the tendency of an investment to respond to marketplace swings. The higher beta the greater the volatility, and vice versa.

A third formula, *Jensen's measure*, is often used to rate a money manager's performance against a market index, and whether or not a investment's risk was worth its reward. The formula is:

(Portfolio return – Risk-free return) – Portfolio beta × (Benchmark return – Risk-free return) = Jensen's measure

Other Practical Considerations

- A fourth formula, the *Sortino ratio*, also exists. Its focus is more on downside risk than potential opportunity, and its calculation is more complex.
- There are no benchmarks for these values. In order to be useful the numbers should be compared with the ratios of other investments.
- No single measure is perfect, so experts recommend using them broadly. For instance, if a particular investment class is on a roll and does not experience a great deal of volatility, a return per unit of risk does not necessarily reflect management genius. When the overall momentum of technology stocks drove returns straight up in 1999, Sharpe ratios climbed with them, and did not reflect any of the sector's volatility that was to erupt in late 2000.
- Most of these measures can be used to rank the risk-adjusted performance of individual stocks, various portfolios over the same time, and mutual funds with similar objectives.

4.4.8 Expected Rate Of Return

What It Measures

The projected percentage return on an investment, based on the weighted probability of all possible rates of return.

No self-respecting businessperson or organization should make an investment without first having some understanding of how successful that investment is likely to be. Expected rate of return provides such an understanding, within certain limits.

How It Works in Practice

The formula for expected rate of return is:

$E[r]=\sum_s P(s)r_s$

where $E[r]$ is the expected return, $P(s)$ is the probability that the rate r_s occurs, and r_s is the return at s level.

A simple example, as given below, is far easier to grasp, and adequately illustrates the principle which the formula expresses. It will also probably be of more practical use to most of those who need to calculate ERR:

The current price of ABC, Inc. stock is trading at $10. At the end of the year, ABC shares are projected to be traded:

- 25% higher if economic growth exceeds expectations—a probability of 30%;
- 12% higher if economic growth equals expectations—a probability of 50%;
- 5% lower if economic growth falls short of expectations—a probability of 20%.

To find the expected rate of return, simply multiply the percentages by their respective probabilities and add the results:

(30% × 25%) + (50% × 12%) + (25% × –5%) =

7.5 + 6 + –1.25 = 12.25% ERR

A second example:

- if economic growth remains robust (a 20% probability), investments will return 25%;
- if economic growth ebbs, but still performs adequately (a 40% probability), investments will return 15%;
- if economic growth slows significantly (a 30% probability), investments will return 5%;
- if the economy declines outright (a 10% probability), investments will return 0%.

Therefore:

(20% × 25%) + (40% × 15%) + (30% × 5%) + (10% × 0%) =

5% + 6% + 1.5% + 0% = 12.5% ERR

Another method that can be used to project expected return is the Capital Asset Pricing Model (CAPM), which is explained separately.

Other Practical Considerations

- The probability totals must always equal 100% for the calculation to be valid.
- Be sure not to overlook any negative numbers in the calculations, or the results produced will be incorrect.

An ERR calculation is only as good as the scenarios considered. Wildly unrealistic scenarios will produce an equally unreliable expected rate of return.

4.4.9. Total Return

What It Measures

The total percentage change in the value of an investment over a specified time period, including capital gains, dividends, and the investment's appreciation or depreciation.

Total return furnishes fundamental information that every investor seeks sooner or later: all things considered, just how much did my investment return?

That in itself makes total return rather important. In addition, there are several sound reasons for paying close attention to each of its components. For those who invest to maximize income, dividends will be very important. For those who invest for long-term growth, capital appreciation will be equally important.

Knowing how much of an investment's total return is attributable to each of the components can help in assessing how volatile the fund is likely to be, how tax-efficient it is, and how much steady income it can be expected to produce.

How It Works in Practice

The total return formula reflects all the ways in which an investment may earn or lose money: dividends as income, capital gains distributions, and capital appreciation—the increase or decrease in the investment's net asset value (NAV):

(Dividends + Capital gains distributions +/- Change in NAV) / Beginning NAV = Total return x 100%

If, for instance, you buy a stock with an initial NAV of $40, and after one year it pays an income dividend of $2 per share and a capital gains distribution of $1, and its NAV has increased to $42, then the stock's total return would be:

(2 + 1 + 2) / 40 =

5 / 40 = 0.125 x 100% = 12.5%

Other Practical Considerations

- The total return time frame is usually one year, and it assumes that dividends have been reinvested.
- If a fund's capital gains exceed its capital losses for the year, most of the net gain must be distributed to shareholders as a capital gains distribution.
- Total return measures past performance only; it cannot predict future results.
- Total return generally does not take into account any sales charges that an investor paid to invest in a fund, or taxes they might owe on the income dividends and capital gains distributions received.
- Rules of the U.S. Securities & Exchange Commission require a company to show a comparison of the total return on its common stock for the last five fiscal years with the total returns of a broad market index and a more narrowly focused industry or group index.
- Total return can be a key yardstick in selecting funds once an investor has set objectives and a time horizon, and made decisions about risk and reward.

4.4.10. Determining An Annual Percentage Rate

What It Measures

Either the rate of interest that invested money earns in one year, or the cost of credit expressed as a yearly rate.

It enables an investor or borrower to compare like with like. When evaluating investment alternatives, naturally it's important to know which one will pay the greatest return. By the same token, borrowers want to know which loan alternative offers the best terms. Determining the annual percentage rate provides a direct comparison.

How It Works In Practice

To calculate the annual percentage rate (APR), apply this formula:

APR = [1 + i/m]m – 1.0

In the formula, i is the interest rate quoted, expressed as decimal, and m is the number of compounding periods per year. For example:

If a bank offers a 6% interest rate, paid quarterly, the APR would be calculated this way:

APR = [1 + i/m]m – 1.0

= [1 + 0.06/4]4 – 1.0

= [1 + 0.015] 4 – 1.0

= (1.015) 4 – 1.0

= 1.0614 – 1.0

= 0.0614

= 6.14% APR

Other Practical Considerations

- As a rule of thumb, the annual percentage rate is slightly higher than the quoted rate.
- When using the formula, be sure to express the rate as a decimal, that is, 6% becomes 0.06.
- When expressed as the cost of credit, APR includes other costs in addition to interest, such as loan closing costs and financial fees.
- APR provides an excellent basis for comparing mortgage or other loan rates; in the United States, lenders are required to disclose it.

When used in the context of investment APR also can be called the "annual percentage yield," or APY.

4.4.11. Detrmining Efficiency And Operating Rates And Ratios

What It Measures

The portion of operating revenues or fee income spent on overhead expenses.

Often identified with banking and financial sectors, the efficiency ratio indicates a management's ability to keep overhead costs low. This measurement also is used by mature industries, such as steel manufacture, chemicals, or auto production, that must focus on tight cost controls to boost profitability because growth prospects are modest.

In some industries, the efficiency ratio is called the overhead burden: overhead as a percentage of sales.

A different method measures efficiency simply by tracking three other measures: accounts payable to sales, days sales outstanding, and inventory turnover, which indicates how fast a company is able to move its merchandise. A general guide is that if the first two of these measures are low and third is high, efficiency is probably high; the reverse is likewise true.

How It Works in Practice

The efficiency ratio is defined as operating overhead expenses divided by fee income plus tax equivalent net interest income. If operating expenses are $100,000, and revenues (as defined) are $230,000, then:

100,000 / 230,000 = 0.43 efficiency ratio

However, not everyone calculates the ratio in the same way. Some institutions include all non-interest expenses, while others exclude certain charges, and intangible asset amortization.

To find the inventory turnover ratio, divide total sales by total inventory. If net sales are $300,000, and inventory is $100,000, then:

300,000 / 140,000 = 2.14 inventory turnover ratio

To find the accounts payable to sales ratio, divide a company's accounts payable by its annual net sales. A high ratio suggests that a company is using its suppliers' funds as a source of cheap financing because it is not operating efficiently enough to generate its own funds. If accounts payable are $50,000, and total sales are $300,000, then:

42,000 / 300,000 = 0.14 x 100 = 14% accounts payable to sales ratio

Other Practical Considerations

- Identifying "overhead" to calculate the efficiency ratio can itself contribute to overall inefficiency. Some financial experts contend that efficiency can be measured equally well by reviewing earnings per share growth and return on equity.
- Some banks identify amortization of goodwill expense, and pull it out of their non-interest expense in order to calculate what is called the cash efficiency ratio: non-interest expense minus goodwill amortization expense divided into revenue.

In banking, an acceptable efficiency ratio was once in the low 60s. Now the goal is 50, while better-performing banks boast ratios in the mid 40s. Low ratings usually indicate a higher return on equity and earnings.

4.5. Working capital and Cash-flow analysis

4.5.1. Working Capital Concept

Working capital comprises the total net current assets of a business, which are its stocks, debtors, and cash—minus its creditors.

Obviously, it is vital for a company to have sufficient working capital to meet all of its requirements. The faster a business expands, the greater will be its working capital needs.

If current assets do not exceed current liabilities, a company may well run into trouble paying creditors who want their money quickly. Indeed, the leading cause of business failure is not lack of profitability, but rather lack of working capital, which helps explain why some experts advise: "use someone else's money every chance you get and don't let anyone else use yours."

How It Works in Practice

Working capital is also called net current assets or current capital, and is expressed as:

Current assets – current liabilities

Current assets are cash and assets that can be converted to cash within one year or a normal operating cycle; current liabilities are monies owed that are due within one year.

If a company's current assets total $300,000 and its current liabilities total $160,000, its working capital is:

$300,000 – $160,000 = $140,000

The working capital cycle describes capital (usually cash) as it moves through a company: It first flows from a company to pay for supplies, materials, finished goods inventory, and wages to workers who produce goods and services. It then flows into a company as goods and services are sold, and as new investment equity and loans are received. Each stage of this cycle consumes time. The more time the stages consume, the greater the demands on working capital.

Other Practical Considerations

- Good management of working capital includes actions like collecting receivables faster and moving inventory more quickly; generating more cash increases working capital.
- While it can be tempting to use cash to pay for fixed assets like computers or vehicles, doing so reduces the amount of cash available for working capital.

- If working capital is tight, consider other ways of financing capital investment, such as loans, fresh equity, or leasing.
- Early warning signs of insufficient working capital include: pressure on existing cash; exceptional cash-generating activities such as offering high discounts for early payment; increasing lines of credit; partial payments to suppliers and creditors; a preoccupation with surviving rather than managing; frequent short-term emergency requests to the bank, for example, to help pay wages, pending receipt of a check.
- Several ratios measure how effectively and efficiently working capital is being used. These ratios are explained separately.

4.5.2. Working Capital Productivity

How effectively a company's management is using its working capital. It is obvious that capital not being put to work properly is being wasted, which is certainly not in investors' best interests.

As an expression of how effectively a company spends its available funds compared with sales or turnover, the working capital productivity figure helps establish a clear relationship between its financial performance and process improvement. The relationship is said to have been first observed by the U.S. management consultant George Stalk while working in Japan.

A seldom-used reciprocal calculation, the working capital turnover or working capital to sales ratio, expresses the same relationship in a different way.

How It Works in Practice

To calculate working capital productivity, first subtract current liabilities from current assets, which is the formula for working capital, then divide this figure into sales for the period.

Sales / (Current assets – Current liabilities) = Working capital productivity

If sales are $3,250, current assets are $900 and current liabilities are $650, then:

3250 / (900 – 650) = 3250 / 250 = 13 working capital productivity

In this case, the higher the number the better. Sales growing faster than the resources required to generate them is a clear sign of efficiency and, by definition, productivity.

The working capital to sales ratio uses the same figures, but in reverse:

Working capital / Sales × 100% = working capital to sales ratio

Using the same figures in the example above, this ratio would be calculated:

250 / 3250 = 0.077 × 100% = 7.7%

For this ratio, obviously, the lower the number the better.

Other Practical Considerations

- By itself, a single ratio means little; a series of them, several quarters' worth, for example, points to a direction over time, and means a great deal.
- Some experts recommend doing quarterly calculations and averaging them for a given year to arrive at the most reliable number.
- Either ratio also helps a management compare its performance with that of competitors.
- These ratios should also help motivate companies to improve processes, such as eliminating steps in the handling of materials and bill collection, and shortening product design times. Such improvements reduce costs and make working capital available for other tasks.

4.5.3. Cash Flow

What It Measures

The statement of cash flows is an important analytical tool that enables the to determine how a company obtains and uses its economic resources.

The cash flow statement is used to: Appraise management decision over time; Evaluate the sources and uses of cash – where it came from and how it was used; Explain the disposition of profits; Evaluate the size, composition and stability of operating cash flows; Determine how wisely and prudently the company ménages its cash.

By creating a structured report that shows the inflows and outflows of cash associated with the operating, investing, and financing activities of a company, the analyst can understand management's decisions over time. Besides changes in balance sheet accounts, actual cash flow information is taken from the current income statement.

Analysis of a company's cash flow statement focuses on adequacy of the company's operating cash flow, the appropriateness of its investment cash flows and the proper structuring of the financing cash flows. The statement allows the analyst to focus on net cash after operations. Net cash after operations must be positive to repay bank debt, fund fixed asset purchases, and repay debt.

How It Works in Practice

Since debt is repaid with cash, the statement of cash flows helps the analyst to determine both the company's funding needs and its sources of repayment.

The statement of cash flows shows INFLOWS and OUTFLOWS of cash categorized as:

- Operating funds flows
- Investing Activities
- Financing Activities.

INDIRECT METHOD starts with net profit and balances to the changes in cash.

1	Net income after tax
2	Depreciation
3	+/- changes on Accounts Receivable
4	+/- changes in Inventory
5	+/- changes on other Current Assets Account
6	+/- changes on Accounts Payable
7	+/- changes on Accrued Expenses
8	+/- changes on Accrued and delayed taxes on income
9	+/- changes on other Current Liabilities Accounts
10	+/- changes on other Noncurrent Liabilities
11	**Operating funds flows (Operating Cash Flow)**
12	+/- changes on Securities Account
13	+/- changes in Long Term Investment
14	+/- changes in Gross Fixed Assets
15	Non expected profit (loss)
16	Intangible and Other Assets
17	**Investing funds flows**
18	***Cash flow before Financing Activities (row 11 + row 17)***
19	+/- changes in Short Term Loan
20	+/- changes in Long Term Loan
21	+/- changes in Subordinated Loan
22	+/- changes in Capital
23	Dividends paid
24	Adjustments on Retained Earning Account
25	Other Interest
26	**Financing funds flows**
27	**TOTAL CASH FLOW (row 11+ row 17 + row 26)**
28	Beginning Cash
29	Plus Operating cash flow (row 11)
30	Investing cash flow (row 17)
31	Financing cash flow (row 26)
32	Ending Cash

DIRECT METHOD reflects the priorities of claims on operating cash flow with later items being more discretionary. The analyst uses the amounts from the income statement

Sales –net	
(Increase) decrease in receivables	
Cash from sales	
(Cost of goods sold)[1]	
(Increase) decrease in inventories	
Increase (decrease) in payables	
Cash production costs	
Gross cash profit	
(Selling, general and administrative expense)[1]	
(Increase) decrease in prepaids	
Increase (decrease) in accruals	
Cash operating expense	
Cash after operations	
Miscellaneous cash income[2]	
Income taxes paid[3]	
Net cash after operations	
Interest expense	
Dividends paid/ owner withdrawals	
Financing costs	
Net cash income	
Current portion long-term debt[4]	
Cash after debt amortization	
Capital expenditures[5]	
Long-term investments/ intangibles	
Financial surplus (requirements)	
Increase (decrease) short-term debt	
Increase (decrease) long-term debt[6]	
Increase (decrease) equity[7]	
Total external financing	
Cash after financing	
Actual change in cash	

Other Practical Considerations

- An increase in assets constitutes a use of cash and decrease in assets constitutes a source of cash;
- Any increase in liabilities constitutes a source of cash, while a decrease in liabilities constitutes a use of cash;
- An increase in equity constitutes a source of cash, while a decrease in equity constitutes a use of cash;

- The direct method of cash flow analysis is used by many bankers because this approach is designed to meet the needs of bankers who focus on the borrower's ability to generate sufficient operating cash flow to pay the costs of operation, interest, scheduled principal and fund growth;
- If the statement of cash flows reveals that current assets have grown (a use of cash), an analyst should investigate whether or not this growth is in proportion to the growth of sales or it suggests a managerial problem;
- If the company's assets have decreased (a source of cash), the analyst should determine whether or not that decrease reflects a decrease in sales, or whether the company is using short-term assets to fund operating losses;
- If the statement of cash flows shows that accounts payable or other accruals have grown (a source of cash), the analyst should determine if that growth is in response to increased sales or if the company has been slow in paying the accounts payable due to cash shortages.

4.6. Ratio Analysis

Financial statement analysis is a judgmental process. One of the primary objectives is identification of major changes in trends, and relationships and the investigation of the reasons underlying those changes. The judgment process can be improved by experience and the use of analytical tools. Probably the most widely used financial analysis technique is ratio analysis, the analysis of relationships between two or more line items on the financial statement. Financial ratios are usually expressed in percentage or times. Generally, financial ratios are calculated for the purpose of evaluating aspects of a company's operations and fall into the following categories:

- *liquidity ratios* measure a firm's ability to meet its current obligations.
- *profitability ratios* measure management's ability to control expenses and to earn a return on the resources committed to the business.
- *leverage ratios* measure the degree of protection of suppliers of long-term funds and can also aid in judging a firm's ability to raise additional debt and its capacity to pay its liabilities on time.
- *efficiency, activity or turnover ratios* provide information about management's ability to control expenses and to earn a return on the resources committed to the business.

A ratio can be computed from any pair of numbers. Given the large quantity of variables included in financial statements, a very long list of meaningful ratios can be derived. A standard list of ratios or standard computation of them does not exist. The following ratio presentation includes ratios that are most often used when evaluating the credit worthiness of a customer. Ratio analysis becomes a very personal or company driven procedure. Analysts are drawn to and use the ones they are comfortable with and understand.

4.6.1. Summary of Most Commonly Used Ratios

Liquidity Ratios

Working Capital

Working capital compares current assets to current liabilities, and serves as the liquid reserve available to satisfy contingencies and uncertainties. A high working capital balance is mandated if the entity is unable to borrow on short notice. The ratio indicates the short-term solvency of a business and in determining if a firm can pay its current liabilities when due.

- Formula

Current Assets
<u>- Current Liabilities</u>

Acid Test or Quick Ratio

A measurement of the liquidity position of the business. The quick ratio compares the cash plus cash equivalents and accounts receivable to the current liabilities. The primary difference between the current ratio and the quick ratio is the quick ratio does not include inventory and prepaid expenses in the calculation. Consequently, a business's quick ratio will be lower than its current ratio. It is a stringent test of liquidity.

- Formula

$$\frac{\text{Cash + Marketable Securities + Accounts Receivable}}{\text{Current Liabilities}}$$

Current Ratio

Provides an indication of the liquidity of the business by comparing the amount of current assets to current liabilities. A business's current assets generally consist of cash, marketable securities, accounts receivable, and inventories. Current liabilities include accounts payable, current maturities of long-term debt, accrued income taxes, and other accrued expenses that are due within one year. In general, businesses prefer to have at least one dollar of current assets for every dollar of current liabilities. However, the normal current ratio fluctuates from industry to industry. A current ratio significantly higher than the industry average could indicate the existence of redundant assets. Conversely, a current ratio significantly lower than the industry average could indicate a lack of liquidity.

- Formula

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Cash Ratio

Indicates a conservative view of liquidity such as when a company has pledged its receivables and its inventory, or the analyst suspects severe liquidity problems with inventory and receivables.

- Formula

$$\frac{\text{Cash Equivalents + Marketable Securities}}{\text{Current Liabilities}}$$

Profitability Ratios

Net Profit Margin (Return on Sales)

A measure of net income dollars generated by each dollar of sales.

- Formula

$$\frac{\text{Net Income *}}{\text{Net Sales}}$$

* Refinements to the net income figure can make it more accurate than this ratio computation. They could include removal of equity earnings from investments, "other income" and "other expense" items as well as minority share of earnings and nonrecuring items.

Return on Assets
Measures the company's ability to utilize its assets to create profits.

- Formula

$$\frac{\text{Net Income *}}{\text{(Beginning + Ending Total Assets) / 2}}$$

Operating Income Margin
A measure of the operating income generated by each dollar of sales.

- Formula

$$\frac{\text{Operating Income}}{\text{Net Sales}}$$

Return on Investment
Measures the income earned on the invested capital.

- Formula

$$\frac{\text{Net Income *}}{\text{Long-term Liabilities + Equity}}$$

Return on Equity
Measures the income earned on the shareholder's investment in the business.

- Formula

$$\frac{\text{Net Income *}}{\text{Equity}}$$

Du Pont Return on Assets
A combination of financial ratios in a series to evaluate investment return. The benefit of the method is that it provides an understanding of how the company generates its return.

- Formula

$$\frac{\text{Net Income *}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

Gross Profit Margin
Indicates the relationship between net sales revenue and the cost of goods sold. This ratio should be compared with industry data as it may indicate insufficient volume and excessive purchasing or labor costs.

- Formula

$$\frac{\text{Gross Profit}}{\text{Net Sales}}$$

Financial Leverage Ratio

Total Debts to Assets
Provides information about the company's ability to absorb asset reductions arising from losses without jeopardizing the interest of creditors.

- Formula

$$\frac{\text{Total Liabilities}}{\text{Total Assets}}$$

Capitalization Ratio
Indicates long-term debt usage.

- Formula

$$\frac{\text{Long-Term Debt}}{\text{Long-Term Debt + Owners' Equity}}$$

Debt to Equity
Indicates how well creditors are protected in case of the company's insolvency.

- Formula

$$\frac{\text{Total Debt}}{\text{Total Equity}}$$

Interest Coverage Ratio (Times Interest Earned)
Indicates a company's capacity to meet interest payments. Uses EBIT (Earnings Before Interest and Taxes)

- Formula

$$\frac{\text{EBIT}}{\text{Interest Expense}}$$

Long-term Debt to Net Working Capital
Provides insight into the ability to pay long term debt from current assets after paying current liabilities.

- Formula

$$\frac{\text{Long-term Debt}}{\text{Current Assets - Current Liabilities}}$$

Efficiency Ratios

Cash Turnover
Measures how effective a company is utilizing its cash.

- Formula

$$\frac{\text{Net Sales}}{\text{Cash}}$$

Sales to Working Capital (Net Working Capital Turnover)
Indicates the turnover in working capital per year. A low ratio indicates inefficiency, while a high level implies that the company's working capital is working too hard.

- Formula

$$\frac{\text{Net Sales}}{\text{Average Working Capital}}$$

Total Asset Turnover
Measures the activity of the assets and the ability of the business to generate sales through the use of the assets.

- Formula

$$\frac{\text{Net Sales}}{\text{Average Total Assets}}$$

Fixed Asset Turnover
Measures the capacity utilization and the quality of fixed assets.

- Formula

$$\frac{\text{Net Sales}}{\text{Net Fixed Assets}}$$

Days' Sales in Receivables
Indicates the average time in days, that receivables are outstanding (DSO). It helps determine if a change in receivables is due to a change in sales, or to another factor such as a change in selling terms. An analyst might compare the days' sales in receivables with the company's credit terms as an indication of how efficiently the company manages its receivables.

- Formula

$$\frac{\text{Gross Receivables}}{\text{Annual Net Sales} / 365}$$

Accounts Receivable Turnover
Indicates the liquidity of the company's receivables.

- Formula

$$\frac{\text{Net Sales}}{\text{Average Gross Receivables}}$$

Accounts Receivable Turnover in Days
Indicates the liquidity of the company's receivables in days.

- Formula

$$\frac{\text{Average Gross Receivables}}{\text{Annual Net Sales} / 365}$$

Days' Sales in Inventory
Indicates the length of time that it will take to use up the inventory through sales.

- Formula

$$\frac{\text{Ending Inventory}}{\text{Cost of Goods Sold} / 365}$$

Inventory Turnover
Indicates the liquidity of the inventory.

- Formula

$$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Inventory Turnover in Days
Indicates the liquidity of the inventory in days.

- Formula

$$\frac{\text{Average Inventory}}{\text{Cost of Goods Sold} / 365}$$

Operating Cycle
Indicates the time between the acquisition of inventory and the realization of cash from sales of inventory. For most companies the operating cycle is less than one year, but in some industries it is longer.

- Formula

Accounts Receivable Turnover in Days
+ Inventory Turnover in Day

Days' Payables Outstanding
Indicates how the firm handles obligations of its suppliers.

- Formula

$$\frac{\text{Ending Accounts Payable}}{\text{Purchases} / 365}$$

Payables Turnover
Indicates the liquidity of the firm's payables.

- Formula

$$\frac{\text{Purchases}}{\text{Average Accounts Payable}}$$

Payables Turnover in Days
Indicates the liquidity of the firm's payables in days.

- Formula

$$\frac{\text{Average Accounts Payable}}{\text{Purchases} / 365}$$

Additional Ratios

Altman Z-Score
The Z-score model is a quantitative model developed in 1968 by Edward Altman to predict bankruptcy (financial distress) of a business, using a blend of the traditional financial ratios and a statistical method known as multiple discriminant analysis.

The Z-score is known to be about 90% accurate in forecasting business failure one year into the future and about 80% accurate in forecasting it two years into the future.

- Formula

Z = 1.2 x (Working Capital / Total Assets)
+1.4 x (Retained Earnings / Total Assets)
+0.6 x (Market Value of Equity / Book Value of Debt)
+0.999 x (Sales / Total Assets)
+3.3 x (EBIT / Total Assets)

Z-score	Probability of Failure
less than 1.8	Very High
greater than 1.81 but less than 2.99	Not Sure
greater than 3.0	Unlikely

Bad-Debt to Accounts Receivable Ratio
Bad-debt to Accounts Receivable ratio measures expected uncollectibility on credit sales. An increase in bad debts is a negative sign, since it indicates greater realization risk in accounts receivable and possible future write-offs.

- Formula

$$\frac{\text{Bad Debts}}{\text{Accounts Receivable}}$$

Bad-Debt to Sales Ratio
Bad-debt ratios measure expected uncollectibility on credit sales. An increase in bad debts is a negative sign, since it indicates greater realization risk in accounts receivable and possible future write-offs.

- Formula

$$\frac{\text{Bad Debts}}{\text{Sales}}$$

Book Value per Common Share
Book value per common share is the net assets available to common stockholders divided by the shares outstanding, where net assets represent stockholders' equity less preferred stock. Book value per share tells what each share is worth per the books based on historical cost.

- Formula

$$\frac{\text{(Total Stockholders' Equity - Liquidation Value of Preferred Stocks - Preferred Dividends in Arrears)}}{\text{Common Shares Outstanding}}$$

Common Size Analysis
In vertical analysis of financial statements, an item is used as a base value and all other accounts in the financial statement are compared to this base value.

On the balance sheet, total assets equal 100% and each asset is stated as a percentage of total assets. Similarly, total liabilities and stockholder's equity are assigned 100%, with a given liability or equity account stated as a percentage of total liabilities and stockholder's equity.

On the income statement, 100% is assigned to net sales, with all revenue and expense accounts then related to it.

Cost of Credit

The cost of credit is the cost of not taking credit terms extended for a business transaction. Credit terms usually express the amount of the cash discount, the date of its expiration, and the due date. A typical credit term is 2 / 10, net / 30. If payment is made within 10 days, a 2 percent cash discount is allowed: otherwise, the entire amount is due in 30 days. The cost of not taking the cash discount can be substantial.

- Formula

$$\frac{\text{\% Discount}}{100 - \text{\% Discount}} \times \frac{360}{\text{Credit Period} - \text{Discount Period}}$$

Example

On a $1,000 invoice with terms of 2 /10 net 30, the customer can either pay at the end of the 10 day discount period or wait for the full 30 days and pay the full amount. By waiting the full 30 days, the customer effectively borrows the discounted amount for 20 days.

$1,000 x (1 - .02) = $980

This gives the amount paid in interest as:

$1,000 - 980 = $20

This information can be used to compute the credit cost of borrowing this money.

$$\frac{\text{\% Discount}}{100 - \text{\% Discount}} \times \frac{360}{\text{Credit Period} - \text{Discount Period}}$$

$$= \frac{2}{98} \times \frac{360}{20} = .3673$$

As this example illustrates, the annual percentage cost of offering a 2/10, net/30 trade discount is almost 37%.

Current-Liability Ratios

Current-liability ratios indicate the degree to which current debt payments will be required within the year. Understanding a company's liability is critical, since if it is unable to meet current debt, a liquidity crisis looms. The following ratios are compared to industry norms.

- Formulas

$$\text{Current to Non-current} = \frac{\text{Current Liabilities}}{\text{Non-current Liabilities}}$$

$$\text{Current to Total} = \frac{\text{Current Liabilities}}{\text{Total Liabilities}}$$

Rule of 72
A rule of thumb method used to calculate the number of years it takes to double an investment.

- Formula

$$\frac{72}{\text{Rate of Return}}$$

Example
Paul bought securities yielding an annual return of 9.25%. This investment will double in less than eight years because,

$$\frac{72}{9.25} = 7.78 \text{ years}$$

4.6.2. Quick/Acid-Test Ratio

What It Measures

How quickly a company's assets can be turned into cash, which is why assessment of a company's liquidity also is known as the quick ratio, or simply the acid ratio.

Regardless of how this ratio is labeled, it is considered a highly reliable indicator of a company's financial strength and its ability to meet its short-term obligations. Because inventory can sometimes be difficult to liquidate, the acid-test ratio deducts inventory from current assets before they are compared with current liabilities-which is what distinguishes it from the current ratio.

Potential creditors like to use the acid-test ratio because it reveals how a company would fare if it had to pay off its bills under the worst possible conditions. Indeed, the assumption behind the acid-test ratio is that creditors are howling at the door demanding immediate payment, and that an enterprise has no time to sell off its inventory, or any of its stock.

How It Works In Practice

The acid-test ratio's formula can be expressed in two ways, but both essentially reach the same conclusion. The most common expression is:

(Current assets - Inventory) / Current liabilities = Acid-test ratio

If, for example, current assets total $7,700, inventory amounts to $1,200 and current liabilities total $4,500, then:

(7,700 - 1,200) / 4,500 = 1.44

A variation of this formula ignores inventories altogether, distinguishes assets as cash, receivables, and short-term investments, then divides the sum of the three by the total current liabilities, or:

Cash + Accounts receivable + Short-term investments / Current liabilities = Acid-test ratio

If, for example, cash totals $2,000, receivables total $3,000, short-term investments total $1,000, and liabilities total $4,800, then:

(2,000 + 3,000 + 1,000) / 4,800 = 1.25

There are two other ways to appraise liquidity, although neither is as commonly used: the cash ratio is the sum of cash and marketable securities divided by current liabilities; net quick assets is determined by adding cash, accounts receivable, and marketable securities, then subtracting current liabilities from that sum.

Other Practical Considerations

- In general, the quick ratio should be 1:1 or better. It means a company has a unit's worth of easily convertible assets for each unit of its current liabilities. A high quick ratio usually reflects a sound, well-managed organization in no danger of imminent collapse, even in the extreme and unlikely event that its sales ceased immediately. On the other hand, companies with ratios of less than 1 could not pay their current liabilities, and should be looked at with extreme care.
- While a ratio of 1:1 is generally acceptable to most creditors, acceptable quick ratios vary by industry, as do almost all financial ratios. No ratio, in fact, is especially meaningful without knowledge of the business from which it originates. For example, a declining quick ratio with a stable current ratio may indicate that a company has built up too much inventory; but it could also suggest that the company has greatly improved its collection system.
- Some experts regard the acid-test ratio as an extreme version of the working capital ratio because it uses only cash and equivalents, and excludes inventories. An acid test ratio that is notably lower than the working capital ratio often means that inventories make up a large proportion of current assets. An example would be retail stores.
- Comparing quick ratios over an extended period of time can signal developing trends in a company. While modest declines in the quick ratio do not automatically spell trouble, uncovering the reasons for changes can help find ways to nip potential problems in the bud.
- Like the current ratio, the quick ratio is a snapshot, and a company can manipulate its figures to make it look robust at a given point in time.
- Investors who suddenly become keenly interested in a firm's quick ratio may signal their anticipation of a downturn in the firm's business or in the general economy.

4.6.3. Current Ratio

What It Measures

A company's liquidity and its ability to meet its short-term debt obligations.

By comparing a company's current assets with its current liabilities, the current ratio reflects its ability to pay its upcoming bills in the unlikely event of all creditors demanding payment at once. It has long been the measurement of choice among financial institutions and lenders.

How It Works in Practice

The current ratio formula is simply:

Current assets / Current liabilities = Current ratio

Current assets are the ones that a company can turn into cash within 12 months during the ordinary course of business. Current liabilities are bills due to be paid within the coming 12 months.

For example, if a company's current assets are $300,000 and its current liabilities are $200,000, its current ratio would be:

300,000 / 200,000 = 1.5

As a rule of thumb, the 1.5 figure means that a company should be able to get hold of $1.50 for every $1.00 it owes.

Other Practical Considerations

- The higher the ratio, the more liquid the company. Prospective lenders expect a positive current ratio, often of at least 1.5. However, too high a ratio is cause for alarm too, because it indicates declining receivables and/or inventory—signs that portend declining liquidity.
- A current ratio of less than 1 suggests pressing liquidity problems, specifically an inability to generate sufficient cash to meet upcoming demands.
- Managements use current ratio as well as lenders; a low ratio, for example, may indicate the need to refinance a portion of short-term debt with long-term debt to improve a company's liquidity.
- Ratios vary by industry, however, and should be used accordingly. Some sectors, such as supermarket chains and restaurants, perform nicely with low ratios that would keep others awake at night.
- One shortcoming of the current ratio is that it does not differentiate assets, some of which may not be easily converted to cash. As a result, lenders also refer to the quick ratio.
- Another shortcoming of the current ratio is that it reflects conditions at a single point in time, such as when the balance sheet is prepared. It is possible to make this figure

look good for this occasion alone and, therefore, lenders should not appraise these conditions by the ratio alone.

- A constant current ratio and falling quick ratio signal trouble ahead, because this suggests that a company is amassing assets at the expense of receivables and cash.

4.6.4. Calculating Creditor and Debtor Days

What They Measure

Creditor days is a measure of the number of days on average that a company requires to pay its creditors, while debtor days is a measure of the number of days on average that it takes a company to receive payment for what it sells. It is also called accounts receivable days.

Creditor days is an indication of a company's creditworthiness in the eyes of its suppliers and creditors, since it shows how long they are willing to wait for payment. Within reason, the higher the number the better, because all companies want to conserve cash. At the same time, a company that is especially slow to pay its bills (100 or more days, for example) may be a company having trouble generating cash, or one trying to finance its operations with its suppliers' funds. Ultimately, companies whose creditor days soar have trouble obtaining supplies.

Debtor days is an indication of a company's efficiency in collecting monies owed. In this case, obviously, the lower the number the better. An especially high number is a telltale sign of inefficiency or worse. It may indicate bad debts, dubious sales figures, or a company being bullied by large customers out to improve their own cash position at another firm's expense. Customers whose credit terms are abused also risk higher borrowing costs and related charges.

Changes in both measures are easy to spot, and easy to understand.

How They Work in Practice

To determine creditor days, divide the cumulative amount of unpaid suppliers' bills (also called trade creditors) by sales, then multiply by 365. For example, if suppliers' bills total $800,000 and sales are $9,000,000, the calculation is:

(800,000 / 9,000,000) × 365 = 32.44 days

The company takes 32.44 days on average to pay its bills.

To determine debtor days, divide the cumulative amount of accounts receivable by sales, then multiply by 365. For example, if accounts receivable total $600,000 and sales are $9,000,000, the calculation is:

(600,000 / 9,000,000) × 365 = 24.33 days

The company takes 24.33 days on average to collect its debts.

Other Practical Considerations

- Cash businesses, including most retailers, should have a much lower debtor days figure than noncash businesses, since they receive payment when they sell the goods. A typical target for noncash businesses is 40–50 days.
- An abnormally high creditor days figure may not only suggest a cash crisis, but also the management's difficulty in maintaining revolving credit agreements.
- An increasing number of debtor days also suggests overly generous credit terms (to bolster sales) or problems with product quality.

4.6.5. Calculating Debt-To-Capital Ratio

What It Measures

The percentage of total capital represented by borrowed capital.

By comparing a company's liabilities to its total capital, the debt-to-capital ratio provides a capsule review of the company's debt and is a measure of long-term risk, not short-term liquidity.

The debt-to-capital ratio is also a measure of a company's borrowing capacity, and of its ability to pay scheduled financial payments on term debts and capital leases. Bond-rating agencies and analysts use it routinely to assess creditworthiness. The greater the debt, the higher the risk.

However, it can be misleading to assume that the lowest ratio is automatically the best ratio. A company may assume large amounts of debt in order to expand the business. Utilities, for instance, have high capital requirements, so their debt-to-capital ratios will be high as a matter of course. So are those of manufacturing companies, especially those developing a new technology or new product.

At the same time, the higher the level of debt the more important it is for a company to have positive earnings and steady cash flow.

How It Works In Practice

Although there are variations on exactly what goes into this ratio, the most common method is to divide total liabilities by total assets (total liabilities plus shareholders' equity), or

Total liabilities / total assets = debt-to-capital ratio

For example, if the balance sheet of a corporate annual report lists total liabilities of $9,800,000 and total shareholders' equity of $12,800,000, the debt-to-capital ratio is (calculating in thousands):

9,800 / (9,800 + $12,800) =

9,800 / 22,600 = 0.434, or 43.4% debt-to-capital ratio

Some formulas distinguish different portions of long-term debt. However, that complicates calculations and many experts regard it as unnecessary. It is also common to express the formula as total debt divided by total funds, which produces the same outcome.

Other Practical Considerations

- If a company has minority interests in subsidiaries that are consolidated in the balance sheet, they must be added to shareholders' equity.
- Debt calculations should include capital leases.
- One rule of thumb holds that a debt-to-capital ratio of 60% or less is acceptable, but another holds that 40% is the most desirable.
- A high debt-to-capital ratio means less security for shareholders, because debt holders are paid first in bankruptcies. It still can be tolerable, however, if a company's return on assets exceeds the rate of interest paid to creditors.
- Do not confuse debt-to-capital with debt-to-capitalization, which compares debt with total market capitalization and fluctuates as the company's stock price changes.

4.6.6. Debt-To-Equity Ratio

What It Measures

How much money a company owes compared with how much money it has invested in it by principal owners and shareholders.

The debt-to-equity ratio reveals the proportion of debt and equity a company is using to finance its business. It also measures a company's borrowing capacity. The higher the ratio, the greater the proportion of debt—but also the greater the risk.

Some even describe the debt-to-equity ratio as "a great financial test" of long-term corporate health, because debt establishes a commitment to repay money throughout a period of time, even though there is no assurance that sufficient cash will be generated to meet that commitment.

Creditors and lenders, understandably, rely heavily on the ratio to evaluate borrowers.

How It Works in Practice

The debt-to-equity ratio is calculated by dividing debt by owners' equity, where equity is, typically, the figure stated for the preceding calendar or fiscal year. Debt, however, can be defined either as long-term debt only, or as total liabilities, which includes both long- and short-term debt.

The most common formula for the ratio is:

Total liabilities / owners' equity = debt-to-equity ratio

In our example, a company's long-term debt is $8,000,000, its short-term debt is $4,000,000, and owners' equity totals $9,000,000. The debt-to-equity ratio would therefore be (calculating in thousands):

(8,000 + 4,000) / 9,000 =

12,000 / 9,000 = 1.33 debt-to-equity ratio

An alternative debt-to-equity formula considers only long-term liabilities in the equation. Accordingly:

(8,000 / 9,000 = 0.889 debt-to-equity ratio

There is also a third method, which is the reciprocal of the debt-to-capital ratio; its formula is:

Owners' equity / total funds = debt-to-equity ratio

However, this would be more accurately defined as "equity-to-debt ratio."

Other Practical Considerations

- It is important to understand exactly how debt is defined in the ratio presented.
- Like all ratios, debt-to-equity must be evaluated against those of other companies in a given industry and over a period of time.
- When calculating the ratio, some prefer to use the market value of debt and equity rather than the book value, since book value often understates current value.
- For this ratio, a low number indicates better financial stability than a high one does; if the ratio is high, a company could be at risk, especially if interest rates are rising.
- A ratio greater than one means assets are mainly financed with debt; less than one means equity provides a majority of the financing. Since a higher ratio generally means that a company has been aggressive in financing its growth with debt, volatile earnings can result due to the additional cost of interest.
- Debt-to-equity ratio is somewhat industry-specific, and often depends on the amount of capital investment required.

4.6.6. Accounts Receivable Turnover

What It Measures

The number of times in each accounting period, typically a year, that a firm converts credit sales into cash.

A high turnover figure is desirable, because it indicates that a company collects revenues effectively, and that its customers pay bills promptly. A high figure also suggests that a firm's credit and collection policies are sound.

In addition, the measurement is a reasonably good indicator of cash flow, and of overall operating efficiency.

How It Works in Practice

The formula for accounts receivable turnover is straightforward. Simply divide the average amount of receivables into annual credit sales:

Sales / Receivables = Receivables turnover

If, for example, a company's sales are $4.5 million and its average receivables are $375,000, its receivables turnover is:

4,500,000 / 375,000 = 12

Other Practical Considerations

- It is important to use the average amount of receivables over the period considered. Otherwise, receivables could be misleading for a company whose products are seasonal or are sold at irregular intervals.
- The measurement is also helpful to a company that is designing or revising credit terms.
- Accounts receivable turnover is among the measures that comprise asset utilization ratios, also called activity ratios.

4.6.7. Calculating Contribution Margin

What It Measures

The amounts that individual products or services ultimately contribute to net profit.

Contribution margin helps a business decide how it should direct or redirect its resources.

When managers know the contribution margin-or margins, as is more often the case-they can make better decisions about adding or subtracting product lines, investing in existing products, pricing products or services (particularly in response to competitors' actions), structuring sales commissions and bonuses, where to direct marketing and advertising expenditures, and where to apply individual talents and expertise.

In short, contribution margin is a valuable decision-support tool.

How It Works In Practice

Its calculation is straightforward:

Sales price - variable cost = contribution margin

Or, for providers of services:

Total revenue - total variable cost = contribution margin

For example, if the sales price is $500 and variable cost is $350, the contribution margin is $150, or 30%.

This means that 30 cents of every sales dollar remain to contribute to direct costs and to profit, after the costs directly related to the sales are subtracted.

Contribution margin is especially useful to a company comparing different products or services. For example:

	Product A $	Product B $	Product C $
Sales	260	220	140
Variable costs	178	148	65
Contribution margin	82	72	75
Contribution margin (%)	31/5	32.7	53.6

Obviously, Product C is the most profitable one, even though Product A generates more sales revenue. The analysis suggests that the company might do well to emphasize Product C in its product mix. It further suggests that prices for Products A and B may be too low, or that their cost structures need attention. Notably, none of this information appears on a standard income statement.

Contribution margin also can be tracked over a long period of time, using data from several years of income statements. It can also be invaluable in calculating volume discounts for preferred customers, and break-even sales or volume levels.

Other Practical Considerations

- Contribution margin depends on accurately accounting for all variable costs, including shipping and delivery, or the indirect costs of services. Activity-based cost accounting systems aid this kind of analysis.
- Variable costs include all direct costs (usually labor and materials).

Contribution margin is not a panacea. It will not show so-called loss leaders, for example. And it doesn't consider marketing factors like existing penetration levels, opportunities, or mature markets being eroded by emerging markets.

4.6.8. Borrowing Costs and Capitalization

The costs of borrowing are primarily made up of interest and issuance expenses. The interest rate assigned to a particular debt instrument is based on the level of default risk assumed by the investor. Several rating agencies assess the default risk of public debt issuances and provide a rating that is indicative of credit quality. The credit quality is greater for

secured/collateralized senior debt than for unsecured subordinated debt issued by the same company, and hence, the former typically carries a lower rate of interest. Firms that have higher levels of debt must typically pay higher interest rates to investors to compensate them for the increased risk of default. Capital-intensive businesses can usually maintain greater debt-to-capital ratios for the same level of borrowing costs as businesses that are less capital intensive.

Frequently Asked Questions

What are debt issuance costs and are they always incurred when borrowing money?

Debt issuance costs are the underwriting, legal, and administrative fees required to issue the debt. These fees are significant when issuing debt in the public markets, such as bonds. However, other types of debt, such as private placements or bank loans, are cheaper to issue because they require less underwriting, legal, and administrative support. Consequently, the public issuers of debt are typically *Fortune* 500 firms, while middle-market companies tend to issue debt through private placements.

Do borrowing costs increase or decrease for callable bonds or bonds with detachable stock warrants?

When debt securities are issued with a call feature, the debt can be retired at the discretion of the company until some specified future date. The call feature represents value to the issuing company, much like a call option on equity. The issuer must compensate investors for providing this option. Therefore, the interest rate on callable bonds is typically higher than those on non-callable bonds of the same credit quality. That is, the borrowing costs increase on bonds with a call feature.

The opposite is true of bonds with detachable stock warrants. A stock warrant provides the bondholder the right to purchase shares of common stock in the issuing company at a specified price during a defined period of time. The warrant's strike price is typically at, or higher than, the current market price of the company's stock. Nonetheless, the warrant provides value to the bondholder in the form of a call option on the company's equity. Because these warrants add to the potential total return on the debt, the stated interest rate is usually lower than that on debt issued without warrants of similar credit quality. Borrowing costs are typically lower on bonds with detachable stock warrants.

How it works in practice

When companies borrow money, they enter a formal obligation to make periodic payments of interest and to repay the principal balance outstanding, according to an agreed schedule. The interest payments are typically based on a stated, annual percentage of the original amount borrowed. The interest paid on such obligations represents the cost of borrowing, along with the costs to issue the debt.

The Difference between Funded and Unfunded Debt

The debt can be classified as funded or unfunded. Funded debt is long-term debt or debt that has a maturity date in excess of one year. Unfunded debt is short-term debt requiring repayment within a year from issuance. Funded debt is usually issued in the public markets or

in the form of a private placement to qualified institutional investors. Most unfunded debt is commercial paper or bank lines of credit.

Senior and Subordinated Debt

Debt can also be classified as senior or subordinated, based on its preference to assets in the event of default by the lender. Subordinated lenders have a junior claim to assets in the event of bankruptcy and are paid only after senior creditors' claims have been satisfied.

Senior credit can be secured or unsecured. Much of the corporate debt outstanding is referred to as a bond. However, a true bond is secured by claims against the firm's property, plant, and equipment. For example, many airlines secure their public debt by mortgaging their airplanes. In this example, an airline could be forced to sell its airplanes to pay its public debt if it defaults on the bonds. Most public debt is secured by the good faith and credit of the issuing company, and is more accurately called a debenture. A firm can also pledge certain assets, like accounts receivable, inventory, or property, as collateral for a loan or debt.

Differing Levels of Risk

Even when debt is secured or collateralized, it still does not guarantee repayment by the issuer. A company's underlying asset value and its earnings may be very volatile, increasing the risk of default in a down business cycle. Because this risk can be different from one business to another, there are several national rating agencies that rate public debt based on the credit-worthiness of the borrower. Investment-grade debt securities are securities that are rated in the top four categories of credit-worthiness by Standard & Poor's or Moody's rating agencies. All debt securities rated below investment-grade are considered to be junk bonds.

Different Types of Interest Rate

Debt can have a fixed or floating rate of interest. Fixed-rate debt pays the same interest rate over its term. Most long-term debt is issued with a fixed rate. Many short-term loans are floating-rate instruments based on the prime lending rate, LIBOR (London Interbank Offered Rate) or some other U.S. Treasury security. When the rates on these securities change, the loan rate changes. For example, a line of credit whose current interest rate is 6%, based on one percentage point above the three-year LIBOR rate, will change to 6.25% if the LIBOR rate increases by a quarter of a point. Floating-rate debt is typically used to support a business' working capital requirements.

The Determinants of Credit Quality

The interest rate and, consequently, the borrowing cost is determined by credit quality. Credit quality depends on the type of debt security, the amount of debt relative to total capital, and the capital intensiveness of a company's business. All other things being equal, a secured or collateralized debt security is less risky than an unsecured obligation. Therefore, investors require a greater return for the additional risk assumed by investing in unsecured debt. Likewise, an investor will require a greater return for subordinated debt than for senior credit.

Credit quality also deteriorates as the level of debt grows on the balance sheet of a company. Intuitively, the greater the debt-to-capital ratio-debt plus the value of equity, the greater the risk of default. By continuing to add financial leverage to its business operations, a firm

increases the risks that in a bad year it may not be able to cover its debt service. In studies on cost of capital, it was determined that companies experiencing debt-to-capital ratios between 25% and 45% saw their cost of capital increase exponentially, indicating greater risk of financial distress.

Debt-to-capital Ratios

Finally, firms that are more capital intensive tend to have greater debt-to-capital ratios. For example, automobile and airline manufacturers typically maintain greater leverage than professional services and software companies. The academic explanation given for this circumstance is the degree of industry maturity, lower earnings volatility and the ability to secure more debt with tangible assets. Consequently, companies within more capital-intensive industries tend to have lower borrowing costs at a given debt-to-capital ratio than those in less capital-intensive industries.

Other Practical Considerations

- The costs of borrowing are composed of interest payments and issuance costs. Interest paid on outstanding debt is a function of the credit-worthiness of the borrower. The greater the interest rate on a debt security relative to other, similar securities, the lower the credit quality of the issuer. As credit quality falls below investment-grade, the risk of default becomes ominously greater and the costs of borrowing become more exorbitant.
- The firm's capital structure is another major determinant of credit quality. There is a direct relationship between debt level and default risk. At a given debt to capital ratio, incremental borrowing costs increase dramatically as the firm's risk of financial distress reaches its peak.

4.6.9. Capitalization Ratios

What They Measure

By comparing debt to total capitalization, these ratios reflect the extent to which a corporation is trading on its equity, and the degree to which it finances operations with debt.

While not the focus here, capitalization ratio also refers to the percentage of a company's total capitalization contributed by debt, preferred stock, common stock and other equity.

By themselves, any financial ratio is a rather useless piece of information. Collectively, and in context, though, financial leverage ratios present analysts and investors with an excellent picture of a company's situation, how much financial risk it has taken on, its dependence on debt, and developing trends. Knowing who controls a company's capital tells one who truly controls the enterprise!

How They Work in Practice

A business finances its assets with either equity or debt. Financing with debt involves risk, since debt legally obligates a firm to pay off the debt, plus the interest the debt incurs. Equity financing, on the other hand, does not obligate the firm to pay anything. It is apt to pay investors dividends—but at the discretion of the board of directors. To be sure, business risk accompanies the operation of any enterprise. But how that enterprise opts to finance its operations—how it blends debt with equity—may heighten this risk.

Various experts include numerous formulas among capitalization financial leverage ratios. Three are discussed separately: debt-to-capital ratio, debt-to-equity ratio, and interest cover ratios. What's known as the capitalization ratio per se can be expressed in two ways:

= Long-Term Debt / Long-Term Debt + Owners' Equity

and

= Total Debt / Total Debt + Preferred + Common Equity

For example, a company whose long-term debt totals 5,000 and whose owners hold equity worth $3,000 would have a capitalization ratio of:

= 5,000 / 5,000 + 3,000 =

= 5,000 / 8,000 = .625 capitalization ratio

Both expressions of the capitalization ratio are also referred to "component percentages," since they compare a firm's debt with either its total capital (debt plus equity) or its equity capital. They readily indicate how reliant a firm is on debt financing.

Other Practical Considerations

- Capitalization ratios need to be evaluated over time, and compared with other data and standards. A gross profit margin of 20%, for instance, is meaningless—until one knows that the average profit margin for an industry is 10%; at that point, 20% looks quite attractive. Moreover, if that the historical trend of that margin has been climbing for the last three years, it strong suggests that a company's management has sound and effective policies and strategies in place.
- All capitalization ratios also should be interpreted in the context of a company's earnings and cash flow, and those of its competitors.
- Take care in comparing companies in different industries or sectors. The same figures that appear to be low in one industry can be very high in another.
- Some less frequently used capitalization ratios are based on formulas that use the book value of equity (the stock). When compared with other ratios, they can be misleading, because there usually is little relation between a company's book value and its market value—which is apt to be many times higher, since market value reflects what the investment community thinks the company is worth

4.6.10. Conversion Price

What It Measures

The price per share at which the holder of a convertible bond or debenture, or preferred stock, can convert them into shares of common stock.

Depending on specific terms, the conversion price may be set when the convertible asset is issued.

The conversion price is a key factor in an investment strategy. Knowing it helps investors determine whether or not it is to their advantage to convert their holdings into shares of stock, sell them on the open market, or retain them until they mature or are called by the issuing company.

At the same time, existing stockholders of the issuing company need to know the point at which the value of their shares could be diluted by the creation of additional shares without the concurrent creation of additional capital.

For companies themselves, a conversion price represents an additional financing option: an opportunity to convert debt into equity, an action that itself has advantages and drawbacks.

How It Works In Practice

If the conversion price is set, it will appear in the indenture, a legal agreement between an issuer of a convertible asset and the holder that states specific terms. If the conversion price does not appear in the indenture, a conversion ratio is used to calculate the conversion price.

A conversion ratio of 25:1, for example, means that 25 shares of stock can be obtained in exchange for each $1000 convertible asset held. In turn, the conversion price can be determined simply by dividing $1000 by 25:

$1,000 / 25 = $40 per share

Comparison of a stock's conversion price to its prevailing market price can help decide the best course of action. If the stock of the company in question is trading at $52 per share, converting makes sense, because it increases the value of $1000 convertible to $1300 ($52 x 25 shares). But if the stock is trading at $32 per share, then conversion value is only $800 ($32 x 25) and it is clearly better not to convert.

Other Practical Considerations

- Conversion ratios may change over time, according to the terms of the indenture. This is to ensure that a convertible asset holder is not unduly advantaged and that the value of existing stock is not diluted-which, of course, would anger existing shareholders.
- Shareholders, in turn, need to monitor closely a company that decides to issue a large number of convertible assets, since the value of their shares could ultimately be undermined.

- Convertible bonds closely follow the price of the issuing company's underlying stock. Often, in fact, the respective prices of the bond and the shares to be exchanged are almost equal.

4.6.11. Conversion Ratio

What It Measures

The number of shares of common stock an investor will receive upon converting a convertible security—a bond, debenture, or preferred stock.

The conversion price may be set when the convertible security is issued, depending on its terms.

Like conversion price, the conversion ratio is an investment strategy tool which is used to determine what the value of a convertible security would be if it were converted immediately. By knowing a convertible's value, an investor can compare it with the prevailing price of the issuing company's common stock and decide whether it is best to convert or to continue holding the convertible.

By the same token, holders of common stock in the company issuing the convertible can use the conversion ratio to help monitor the value of their stock. For example, a relatively high ratio could mean that the value of their shares would be diluted if large numbers of convertible holders were to exercise their options.

How It Works in Practice

In the same way as conversion price, the conversion ratio may be established when the convertible is issued. If that is the case, the ratio will appear in the indenture, the binding agreement that details the convertible's terms.

If the conversion ratio is not set, it can be calculated quickly: divide the par value of the convertible security (typically $1,000) by its conversion price.

$1,000 / $40 per share = 25

In this example, the conversion ratio is 25:1, which means that every bond held with a $1,000 par value can be exchanged for 25 shares of common stock.

Knowing the conversion ratio enables an investor to decide quickly whether his convertibles (or group of them) are more valuable than the shares of common stock they represent. If the stock is currently trading at 30, the conversion value is $750, or $250 less than the par value of the convertible. It would therefore be unwise to convert.

Other Practical Considerations

- Although it is rare, a convertible's indenture can sometimes contain a provision stating that the conversion ratio will change over the years.
- A conversion ratio that is set when a convertible is issued usually protects against any dilution from stock splits. However, it does not protect against a company issuing secondary offerings of common stock.
- "Forced conversion" means that the company can make holders convert into stock at virtually any time. Convertible holders should also pay close attention to the price at which the bonds are callable.
- Conversion ratio also describes the number of shares of one common stock to be issued for each outstanding share of another common stock when a merger takes place.

4.6.12. Calculating Earnings Per Share

What It Measures

The portion of a company's profit allocated to each outstanding share of a company's common stock.

Earnings per share is simply a fundamental measure of profitability that shows how much profit was generated on a per-share-of-stock basis. Were the term worded as profit per share, the meaning certainly would be much clearer, if not self-evident.

By itself, EPS doesn't reveal a great deal. Its true value lies in comparing EPS figures across several quarters, or years, to judge the growth of a company's earnings on a per-share basis.

How It Works in Practice

Essentially, the figure is calculated after paying taxes and dividends to preferred shareholders and bondholders. Barring extraordinary circumstances, EPS data is reported quarterly, semiannually, and annually.

To calculate EPS, start with net income (earnings) for the period in question, subtract the total value of any preferred stock dividends, then divide the resulting figure by the number of shares outstanding during that period. Or:

Net income – Dividends on preferred stock / Average number of shares outstanding

By itself, this formula is simple enough. Alas, defining the factors used in the formula invariably introduces complexities and—as some allege on occasion—possible subterfuge.

For instance, while companies usually use a weighted average number of shares outstanding over the reporting period, shares outstanding still can be either "primary" or "fully diluted." Primary EPS is calculated using the number of shares that are currently held by investors in the market and able to be traded. Diluted EPS is the result of a complex calculation that determines how many shares would be outstanding if all exercisable warrants and options were converted into common shares at the end of a quarter. Suppose, for example, that a company has granted a large number of share options to employees. If these options are

capable of being exercised in the near future, that could alter significantly the number of shares in issue and thus the EPS—even though the E part (the earnings) is the same. Often in such cases, the company might quote the EPS on the existing shares and the fully diluted version. Which one a person considers depends on their view of the company and how they wish to use the EPS figure. In addition, firms can report extraordinary EPS, a figure which excludes the financial impact of unusual occurrences, such as discontinued operations or the sale of a business unit.

Net income or earnings, meanwhile, can be defined in a number of ways, based upon respective nations' generally accepted accounting principles.

For example, "pro forma earnings," tend to exclude more expenses and income used to calculate "reported earnings." Pro forma advocates insist these earnings eliminate all distortions and present "true" earnings that allow pure apples-to-apples comparisons with preceding periods. However, "non-recurring expenses" seem to occur with such increasing regularity that one may wonder if a company is deliberately trying to manipulate its earnings figures and present them in the best possible light, rather than in the most accurate light.

"Cash" earnings are earnings from operating cash flow—notably, not EBITDA. In turn, cash EPS is usually these earnings divided by diluted shares outstanding. This figure is very reliable because operating cash flow is not subject to as much judgment at net earnings or pro forma earnings.

Other Practical Considerations

- Given the varieties of earnings and shares reported today, investors need to first determine what the respective figures represent before making investment decisions. There are cases of a company announcing a pro forma EPS that differs significantly from what is reported in its financial statements. Such discrepancies, in turn, can affect how the market values a given stock.
- Investors should check to see if a company has issued more shares during a given period, since that action, too, can affect EPS. A similar problem occurs where there have been a number of shares issued during the accounting period being considered. Which number of issued shares do you use: the opening figure, the closing figure, the mean? In practice the usual method is to use the weighted mean number of shares in issue during the year (weighted, that is, for the amount of time in the year that they have been issued).
- "Trailing" earnings per share is the sum of EPS from the last four quarters, and is the figure used to compute most price-to-earnings ratios.
- Diluted and primary shares outstanding can be the same if a company has no warrants or convertible bonds outstanding, but investors should not assume anything, and need to be sure how "shares outstanding" is being defined.

4.6.13. EBITDA (Earnings before Interest, Tax, Depreciation and Amortization)

What It Measures

A company's earnings from ongoing operations, before net income is calculated.

EBITDA's champions contend it gives investors a sense of how much money a young or fast-growing company is generating before it pays interest on debt, tax collectors, and accounts for noncash changes. If EBITDA grows over time, champions argue, investors gain at least a sense of long-term profitability and, in turn, the wisdom of their investment.

Business appraisers and investors also may study EBITDA to help gauge a company's fair market value, often as a prelude to its acquisition by another company. It also is frequently applied to companies that have been subject to leveraged buyouts—the strategy being that EBITDA will help cover loan payments needed to finance the transaction.

EBITDA, and EBIT, too, are claimed to be good indicators of cash flow from business operations, since it reports earnings before debt payments, taxes, depreciation, and amortization charges are considered. However, that claim is challenged by many—often rather intently.

How It Works in Practice

EBITDA first appeared as leveraged buyouts soared in popularity during the 1980s. It has since become well established as a financial-analysis measure of telecommunications, cable, and major media companies.

Its formula is quite simple. Revenues less the cost of goods sold, general and administrative expenses, and the deductions of items expressed by the acronym, or:

Revenue - Expenses (excluding tax and interest, depreciation, etc.) = EBITDA

or:

Revenue - Expenses (excluding tax and interest) = EBIT

This formula does not measure true cash flow. A communications company, for example, once reported $698 million in EBIT but just $324 million in cash from operations.

Other Practical Considerations

- A definition of EBITDA isn't as yet enforced by standards-making bodies, so companies can all but create their own. As a result, EBITDA can easily be manipulated by aggressive accounting policies, which may erode its reliability.
- Ignoring capital expenditures could be unrealistic and horribly misleading, because companies in capital-intensive sectors such as manufacturing and transportation must

continually make major capital investments to remain competitive. High-technology is another sector that may be capital-intensive, at least initially.

- Critics warn that using EBITDA as a cash flow indicator is a huge mistake, because EBITDA ignores too many factors that impact true cash flow, such as working capital, debt payments and other fixed expenses. Interest and taxes can and do cost a company cash, they point out, while debt holders have higher claims on a company's liquid assets than investors do.
- Critics further assail EBITDA as the barometer of choice of unprofitable firms because it can present a more optimistic view of a company's future than it has a right to claim. "Forbes" magazine, for instance, once referred to EBIDTA as "the device of choice to pep up earnings announcements."
- Even so, EBITDA may be useful in terms of evaluating firms in the same industry with widely different capital structures, tax rates and depreciation policies.

4.6.13 Elasticity

What It Measures

The percentage change of one variable caused by a percentage change in another variable.

Elasticity is defined as "the measure of the sensitivity of one variable to another." In practical terms, elasticity indicates the degree to which consumers respond to changes in price. It is obviously important for companies to consider such relationships when contemplating changes in price, demand, and supply.

Demand elasticity measures how much the quantity demanded changes when the price of a product or service is increased or lowered. Will demand remain constant? If not, how much will demand change?

Supply elasticity measures the impact on supply when a price is changed. It is assumed that lowering prices will reduce supply, because demand will increase—but by how much?

How It Works in Practice

The general formula for elasticity is:

Elasticity = % change in x / % change in y

In theory, x and y can be any variable. However, the most common application measures price and demand. If the price of a product is increased from $20 to $25, or 25%, and demand in turn falls from 6,000 to 3,000, elasticity would be calculated as:

- 50% / 25% = – 2

A value greater than 1 means that demand is strongly sensitive to price, while a value of less than 1 means that demand is not price-sensitive.

Other Practical Considerations

There are five cases of elasticity:

- E = 1, or *unit elasticity*. The proportional change in one variable is equal to the proportional change in another variable: if price rises by 5%, demand falls by 5%.
- E is greater than 1, or just *elastic*. The proportional change in *x* is greater than the proportional change in *y*: if price rises by 5%, demand falls by 3%.
- E = infinity, or *perfectly elastic*. This is a special case of elasticity: any change in *y* will effect no change in *x*. An example would be prices charged by a hospital's emergency room, where increases in price are unlikely to curb demand.
- E is less than 1, or just *inelastic*. The proportional change in *x* is less than the proportional change in *y*: if prices are increased by 3%, demand will fall by 30%.
- E = 0, or *perfectly inelastic*. This is another special case of elasticity: any change in *y* will have an infinite effect on *x*.

There are more complex formulae for determining a range of variables, or "arc elasticity."

Elasticity can be used to affirm two rules of thumb:

- demand becomes elastic if consumers have an alternative or adequate substitute for the product or service;
- demand is more elastic if consumers have an incentive to save money.

4.6.14. Insolvency ratios

The degree of insolvency of a company could be measured with the following ratios:

- Debt/Equity
- Debt/Assets
- Coverage of fixed charges
- Interest coverage

Most commonly in practice is used the criteria of how many days the company could not pay out its obligations.

Debt to Equity

The debt-to-equity ratio can be computed with the following formula, using figures from your balance sheet:

$$\frac{\text{Total Debt}}{\text{Owners' (or Stockholder's) Equity}}$$

The ratio of debt-to-owner's equity or net worth indicates the degree of financial leverage that you're using to enhance your return. A rising debt-to-equity ratio may signal that further increases in debt caused by purchases of inventory or fixed assets should be restrained.

Improving this ratio involves either paying off debt or increasing the amount of earnings retained in the business until after the balance sheet date. For instance, can expenses be deferred beyond the balance sheet date to increase your retained earnings? What about bonuses? Delaying any planned bonus expense serves to increase your retained earnings. As another example, you might think about repaying revolving debt (such as a line of credit) before the balance sheet date and borrowing again after the balance sheet date.

Debt to Assets

This ratio measures the percentage of a business's assets that are financed with debt, and can be calculated using the following formula:

$$\frac{\text{Total Debt}}{\text{Total Assets}}$$

This ratio measures the percentage of assets financed by creditors, compared to the percentage that have been financed by the business owners. Historically, a debt-to-asset ratio of no more than 50 percent has been considered prudent. A higher ratio indicates a possible overuse of leverage, and it may indicate potential problems meeting the debt payments.

Improving this ratio means taking steps to either increase the value of your assets, or to pay off debt. For example, you might explore whether inventory or other assets can be given a higher value. If you go the route of paying off debt, you'll also improve your current ratio and debt-to-equity ratio.

Coverage of fixed charges is also sometimes called "times fixed charges earned."

It can be computed by taking your net income, *before* taxes and fixed charges (debt repayment, long-term leases, preferred stock dividends etc.), and dividing by the amount of fixed charges. The resulting number shows your ability to meet your fixed obligations of all types — the higher the number, the better.

Obviously, an inability to meet any fixed obligation of the business threatens your business's well-being. Many working capital loan agreements will specify that you must maintain this

ratio at a specified level, so that the lender has some assurance that you'll continue to be able to make your payments.

Interest coverage is also sometimes known as the "times interest earned ratio." It is very similar to the "times fixed charges earned" ratio but focuses more narrowly on the interest portion of your debt payments.

To calculate this ratio, you can use the following formula:

$$\frac{\text{Operating Income}}{\text{Interest expense}}$$

By comparing the ratio of operating income to interest expense, you measure how many times your interest obligations are covered by earnings from operations. The higher the ratio, the bigger your cushion and the more able the business is to meet interest payments. If this ratio is declining over time, it's a clear indication that your financial risk is increasing.

4.6.15. Interest cover

What It Measures

The amount of earnings available to make interest payments after all operating and non-operating income and expenses—except interest and income taxes—have been accounted for.

Interest cover is regarded as a measure of a company's creditworthiness because it shows how much income there is to cover interest payments on outstanding debt. Banks and financial analysts also rely on this ratio as a rule of thumb to gauge the fundamental strength of a business.

How It Works in Practice

Interest cover is expressed as a ratio, and reflects a company's ability to pay the interest obligations on its debt. It compares the funds available to pay interest—earnings before interest and taxes, or EBIT—with the interest expense. The basic formula is:

EBIT / interest expense = interest coverage ratio

If interest expense for a year is $9 million, and the company's EBIT is $45 million, the interest coverage would be:

45 million / 9 million = 5:1

The higher the number, the stronger a company is likely to be. Conversely, a low number suggests that a company's fortunes are looking ominous. Variations of this basic formula also exist. For example, there is:

Operating cash flow + interest + taxes / interest = Cash flow interest coverage ratio

This ratio indicates the firm's ability to use its cash flow to satisfy its fixed financing obligations. Finally, there is the fixed-charge coverage ratio, which compares EBIT with fixed charges:

EBIT + lease expenses / interest + lease expense = Fixed charge coverage ratio

"Fixed charges" can be interpreted in many ways, however. It could mean, for example, the funds that a company is obliged to set aside to retire debt, or dividends on preferred stock.

Other Practical Considerations

- A ratio of less than 1 indicates that a company is having problems generating enough cash flow to pay its interest expenses, and that either a modest decline in operating profits or a sudden rise in borrowing costs could eliminate profitability entirely.
- Ideally, interest coverage should at least exceed 1.5; in some sectors, 2.0 or higher is desirable.
- Interest coverage is widely considered to be more meaningful than looking at total debt, because what really matters is what an enterprise must pay in a given period, not how much debt it has.
- As is often the case, it may be more meaningful to watch interest cover over several periods in order to detect long-term trends.
- Cash flow will sometimes be substituted for EBIT in the ratio, because EBIT includes not only cash but also accrued sales and other unrealized income.
- Interest cover also is called "times interest earned."

4.6.16. Calculating marginal cost

What It Measures

The additional cost of producing one more unit of product, or providing service to one more customer.

Sometimes called incremental cost, marginal cost shows how much costs increase from making or serving one more, an essential factor when contemplating a production increase, or seeking to serve more customers.

If the price charged is greater than the marginal cost, then the revenue gain will be greater than the added cost. That, in turn, will increase profit, so the expansion in production or

service makes economic sense and should proceed. Of course, the reverse is also true: If the price charged is less than the marginal cost, expansion should not go ahead.

How It Works in Practice

The formula for marginal cost is:

Change in cost / change in quantity

If it costs a company $260,000 to produce 3,000 items, and $325,000 to produce 3,800 items, the change in cost would be:

$325,000 - $260,000 = $65,000

The change in quantity would be:

3,800 - 3,000 = 800

When the formula to calculate marginal cost is applied, the result is:

$65,000 / 800 = $81.25

If the price of the item in question were $99.95, expansion should proceed.

Other Practical Considerations

- A marginal cost that is lower than the price shows that it is not always necessary to cut prices to sell more goods and boost profits.
- Using idle capacity to produce lower-margin items can still be beneficial, because these generate revenues that help cover fixed costs.
- Marginal cost studies can become quite complicated, because the basic formula does not always take into account variables that can affect cost and quantity. There are software programs available, many of which are industry-specific.
- At some point, marginal cost invariably begins to rise; typically, labor becomes less productive as a production run increases, while the time required also increases.
- Marginal cost alone may not justify expansion. It is best to determine also average costs, then chart the respective series of figures to find where marginal cost meets average cost, and thus determine optimum cost.
- Relying on marginal cost is not fail-safe; putting more product on a market can drive down prices and thus cut margins. Moreover, committing idle capacity to long-term production may tie up resources that could be directed to a new and more profitable opportunity.
- An important related principle is contribution: the cash gained (or lost) from selling an additional unit.

4.6.17. Payout ratio

What It Measures

Dividend cover expresses the number of times a company's dividends to common stockholders could be paid out of its net after-tax profits.

Payout ratio expresses the total dividends paid to shareholders as a percentage of a company's net profit in a given period of time.

Whether defined as dividend cover or payout ratio, it measures the likelihood of dividend payments being sustained, and thus is a useful indication of sustained profitability. However, each ratio must interpreted independently.

A low dividend cover suggests it might be difficult to pay the same level of dividends in a downturn, and that a company is not reinvesting enough in its future. High cover, therefore, implies just the opposite. Negative dividend cover is unusual, and a clear sign of trouble.

The payout ratio, expressed as a percentage or fraction, is an inverse measure: a high ratio indicates a lack of reinvestment in the business, and that current earnings cannot sustain the current dividend payments. In other words, the lower the ratio, the more secure the dividend—and the company's future.

How It Works in Practice

Dividend cover is so named because it shows how many times over the profits could have paid the dividend. If the figure is 3, for example, a firm's profits are three times the level of the dividend paid to shareholders. To calculate dividend cover, divide earnings per share by the dividend per share:

Earnings per share / dividend per share = dividend cover

If a company has earnings per share of $8, and it pays out a dividend of 2.1, dividend cover is:

8 / 2.1 = 3.80

An alternative formula divides a company's net profit by the total amount allocated for dividends. So a company that earns $10 million in net profit and allocates $1 million for dividends has a dividend cover of 10, while a company that earns $25 million and pays out $10 million in dividends has a dividend cover of 2.5:

10,000,000 / 1,000,000 = 10 and 25,000,000 / 10,000,000 = 2.5

The payout ratio is calculated by dividing annual dividends paid on common stock by earnings per share:

Annual dividend / earnings-per-share = payout ratio

Take the company whose earnings per share is $8 and its dividend payout is 2.1. Its payout ratio would be:

2.1 / 8 = .263 or 26.3%

Other Practical Considerations

- A dividend cover ratio of 2 or higher is usually adequate, and indicates that the dividend is affordable. By the same token, the payout ratio should not exceed two-thirds of earnings. Like most ratios, however, both vary by industry. U.S. real estate investment trusts, for example, pay out almost all their earnings in dividends because U.S. tax laws exempt them from taxes if they do so. American utilities also offer high payout rates.
- A dividend cover ratio below 1.5 is risky, and a ratio below 1 indicates a company is paying the current year's dividend with retained earnings from a previous year—a practice that cannot continue indefinitely.
- The higher the dividend cover figure, the less likely the dividend will be reduced or eliminated in the future should profits fall. Companies that suffer sharp declines or outright losses will often continue paying dividends to indicate that their substandard performance is an anomaly.
- On the other hand, a high dividend cover figure may disappoint an investor looking for income, since the figure suggests directors could have declared a larger dividend.
- A high payout ratio clearly appeals to conservative investors seeking income. However, when coupled with weak or falling earnings it could suggest an imminent dividend cut, or that the company is short-changing reinvestment to maintain its payout.
- A payout ratio above 75% is a warning. It suggests the company is failing to reinvest sufficient profits in its business, that the company's earnings are faltering, or that it is trying to attract investors who otherwise would not be interested.
- Newer and faster-growing companies often pay no dividends at all in order to reinvest earnings in the company's development.
- Historically, dividends have provided more than 40% of a stock investor's total portfolio return. However, the figure has been about half that over the last 20 years.

4.6.18. Calculating Price/Earnings ratio (P/E)

What It Measures

The price/earnings ratio (P/E) is simply the share price divided by earnings per share (EPS). While EPS is an actual amount of money, usually expressed in cents per share, the P/E ratio has no units, it is just a number. Thus if a quoted company has a share price of $100 and EPS of $12 for the last published year, then it has a historical P/E of 8.3. If analysts are forecasting for the next year EPS of, say, $14 then the forecast P/E is 7.1.

Since EPS is the annual earnings per share of a company, it follows that dividing the share price by EPS tells us how many years of current EPS are represented by the share price. In the

above example then, the P/E of 8.3 tells us that investors at the current price are prepared to pay 8.3 years of historical EPS for the share, or 7.1 years of the forecast next year's EPS. Theoretically the faster a company is expected to grow, the higher the P/E ratio that investors would award it. It is one measure of how cheap or expensive a share appears.

How It Works in Practice

Forecasts can go wrong of course, resulting in the infamous profit warnings that are issued by some companies. In these they warn that expected profit targets, for various reasons, will not be met. Understandably, a slump in the share price is the normal reaction, and analysts would then downgrade their existing forecast EPS. If in the above example our forecast of $14 for next year was halved to $7 following a profit warning, the forecast P/E on the same price of $100 would immediately double to 14.3—but in practice the price would usually fall substantially, thus cutting back the forecast P/E.

The P/E ratio is predominantly useful in comparisons with other shares rather than in isolation. For example, if the average P/E in the market is 20, there will be many shares with P/Es well above and well below this, for a variety of reasons. Similarly, in a particular sector, the P/Es will frequently vary quite widely from the sector average, even though the constituent companies may all be engaged in broadly similar businesses. The reason is that even two businesses doing the same thing will not always be doing it as profitably as each other. One may be far more efficient, as demonstrated by a history of rising EPS compared with the flat EPS picture of the other over a series of years, and the market might recognize this by awarding the more profitable share a higher P/E.

Other Practical Considerations

- Take care. The market frequently gets it wrong and many high P/E shares have in the past been the most awful long-term investments, losing investors huge amounts of money when the promise of future rapid growth proved to be a chimera. In contrast many low P/E companies, often in what are perceived as dull industries, have proved over time to be outstanding investments.
- The P/E is an investment tool that is both invaluable, and yet requires extreme caution in its application, when comparing and selecting investments. It remains though by far the most commonly utilized ratio in investment analysis.

4.6.19. Calculating Price/Sales Ratio (P/S)

What It Measures

The price/sales ratio (P/S) is another measure, like the price/earnings (P/E) ratio, of the relative value of a share when compared with others.

Like many such price-based ratios, it does not mean too much in isolation but acquires worth when making comparisons. So a figure of 0.33 does not say a lot on its own, until you start to look at how this matches up to the market average or the sector average, for example.

How It Works in Practice

The P/S ratio is obtained by dividing the market capitalization by the latest published annual sales figure. So a company with a capitalization of $1 billion and sales of $3 billion would have a P/S ratio of 0.33.

P/S will vary with the type of industry. You would expect, for example, that many retailers and other large-scale distributors of goods would have very high sales in relation to their market capitalizations—in other words, a very low P/S. Equally, manufacturers of high-value items would generally have much lower sales figures and thus higher P/S ratios. Like anything to do with share analysis (this being more of an art than a science), it is not always that clear cut … but that would be the general trend. If you rank companies by ascending P/S, you will find usually that supermarket chains figure among the lowest ones.

A company with a lower P/S is cheaper than one with a higher ratio, particularly if they are in the same sector so that a direct comparison is more appropriate. It means that each share of the lower P/S company is buying you more of its sales than those of the higher P/S company.

Note though, that it is cheaper only on P/S grounds … that does not mean it is necessarily the more attractive share. There will frequently be reasons why it has a lower ratio than another ostensibly similar company, most commonly because it is less profitable. As far as corporate efficiency goes, this ratio considers only sales, the top line of the profit and loss account. It is a long way from there to the bottom line, the bit that really counts (that is, how much profit the company has made).

Other Practical Considerations

- A loss-making company would thus still have a P/S ratio, even though it would have no P/E ratio. In consequence, like all investment analysis tools, P/S has to be used with care—but it can be of use for investors. P/S was cited in an extensive study of the New York Stock Exchange as one leading indicator for selecting very long-term shares that perform well.

4.6.20. Calculating the Reserve Ratio

What It Measures

In the United Kingdom and in certain European countries, there is no compulsory ratio, although banks will have their own internal measures and targets to be able to repay customer deposits as they forecast they will be required. In the United States, the policy is more prescriptive, and specified percentages of deposits—established by the Federal Reserve Board—must be kept by banks in a non-interest-bearing account at one of the twelve Federal Reserve Banks located throughout the country.

To provide stability. In view of the volume and unpredictability of transactions that clear through their accounts every day, banks and financial depositories must maintain a cushion of

funds to protect themselves against debits that could leave their accounts overdrawn at the end of the day, and thus subject to penalty.

As a result of the creation of reserve ratios, periods of financial stress are no longer characterized by runs on banks by depositors.

How It Works in Practice

In Europe, the reserve requirement of an institution is calculated by multiplying the reserve ratio for each category of items in the reserve base, set by the European Central Bank, with the amount of those items in the institution's balance sheets. These figures vary according to the institution.

The required reserve ratio in the United States is set by federal law, and depends on the amount of checkable deposits a bank holds. The first $44.3 million of deposits are subject to a 3% reserve requirement. Deposits in excess of $44.3 million are subject to 10% reserve requirement. These breakpoints are reviewed annually in accordance with money supply growth. No reserves are required against certificates of deposit or savings accounts.

The reserve ratio requirement limits a bank's lending to a certain fraction of its demand deposits. The current rule allows a bank to issue loans in an amount equal to 90% of such deposits, holding 10% in reserve. The reserves can be held in any combination of vault cash and deposit at a Federal Reserve Bank.

A bank facing a reserve deficiency has several options. It can try to borrow reserves for one or more days from another bank, sell marketable assets such as government securities, or bid for funds in the money market, such as large CDs or Eurodollars. As a last resort, it can pledge collateral and borrow at the Federal Reserve's discount window.

In order to meet deposit withdrawal contingencies, many banks maintain a margin of excess reserves above the required reserve ratio, since the required reserves are really not available to meet withdrawal liquidity needs. Excess reserves are higher than those needed to meet reserve and clearing requirements, and provide extra protection against overdrafts and deficiencies in required reserves.

Other Practical Considerations

- Because reserves earn no interest, they have an adverse effect on bank earnings.
- In practice, the required reserve ratio has been adjusted only infrequently by the U.S. Federal Reserve Board.
- U.S. depository institutions hold required reserves in one of two forms: vault cash on hand at the bank or—more significant for monetary policy—required reserve balances in accounts with the Reserve Bank for their respective Federal Reserve District.

4.6.21. Calculating payback period

What It Measures

How long it will take to earn back the money invested in a project.

The straight payback period method is the simplest way of determining the investment potential of a major project. Expressed in time, it tells a management how many months or years it will take to recover the original cash cost of the project—always a vital consideration, and especially so for managements evaluating several projects at once.

This evaluation becomes even more important if it includes an examination of what the present value of future revenues will be.

How It Works in Practice

The straight payback period formula is:

cost of project / annual cash revenues = payback period

Thus, if a project cost $100,000 and was expected to generate $28,000 annually, the payback period would be:

100,000 / 28,000 = 3.57 years

If the revenues generated by the project are expected to vary from year to year, add the revenues expected for each succeeding year until you arrive at the total cost of the project.

For example, say the revenues expected to be generated by the $100,000 project are:

	Revenue	*Total*
Year 1	$19,000	$19,000
Year 2	$25,000	$44,000
Year 3	$30,000	$74,000
Year 4	$30,000	$104,000
Year 5	$30,000	$134,000

Thus, the project would be fully paid for in Year 4, since it is in that year the total revenue reaches the initial cost of $100,000. The precise payback period would be calculated as:

((100,000 – 74,000) / (1000,000 – 74,000)) × 365 = 316 days + 3 years

The picture becomes complex when the time value of money principle is introduced into the calculations. Some experts insist this is essential to determine the most accurate payback period. Accordingly, present value tables or computers (now the norm) must be used, and the

annual revenues have to be discounted by the applicable interest rate, 10% in this example. Doing so produces significantly different results:

	Revenue	*Present value*	*Total*
Year 1	$19,000	$17,271	$17,271
Year 2	$25,000	$20,650	$37,921
Year 3	$30,000	$22,530	$60,451
Year 4	$30,000	$20,490	$80,941
Year 5	$30,000	$18,630	$99,571

This method shows that payback would not occur even after five years.

Other Practical Considerations

- Clearly, a main defect of the straight payback period method is that it ignores the time value of money principle, which, in turn, can produce unrealistic expectations.
- A second drawback is that it ignores any benefits generated after the payback period, and thus a project that would return $1 million after, say, six years, might be ranked lower than a project with a three-year payback that returns only $100,000 thereafter.
- Another alternative to calculating by payback period is to develop an internal rate of return.
- Under most analyses, projects with shorter payback periods rank higher than those with longer paybacks, even if the latter project higher returns. Longer paybacks can be affected by such factors as market changes, changes in interest rates, and economic shifts. Shorter cash paybacks also enable companies to recoup an investment sooner and put it to work elsewhere.
- Generally, a payback period of three years or less is desirable; if a project's payback period is less than a year, some contend it should be judged essential.

5. HOW TO WRITE AN APPRAISER'S REPORT

The guidelines for writing an Appraiser's report are established by the International Valuation Standard No. 3 (Valuation reporting – IVS 3).

The basic principles for writing a good business valuation report are similar to these for writing a good term paper o thesis. The reader should be able to understand:

1. The purpose and the scope of the assignment.
2. The steps taken to carry it out.
3. The conclusion reached.
4. The logical flow of data and rationale that led to and supported the conclusion.

The report should be well organized, as comprehensive as the purpose calls for, well documented, and presented in a correct, consistent, and easily readable style. The entire content should be relevant to the report's purpose, avoiding extraneous material.

The report writer should be conscious of the intended audience and write in a manner that they will understand it and find it convincing. The report should be free of obscure jargon. If required to use terminology or references unfamiliar to the intended audience, the appraiser should explain such items sufficiently that their relevance to the report and the points being made are well understood. Each aspect of the conclusion(s) should be so clearly supported that no link in the chain of data and rationale leading to the conclusion need be left to the reader's imagination.

The report should be coherent. This means that the topics should flow smoothly from one another, linked by logical transitions when necessary. Topics should be completed under topic headings. The reader should never be led to focus on one topic only to find that the writer has suddenly and without warning decided to talk about something else.

The report should be replicable and supported with adequate documentation. All sources of information that are being used should be properly cited and available. Such documentation becomes particularly important if the work must ever be defended in court.

The report should be internally consistent. If in the introduction have been made certain critical assumptions or the relevance of list of factors has been pointed out, then further in the analytical part these should be discussed in adequate detail.

The report should be written according to the valuation assignment and reflect all of its aspects. Of critical importance are the restrictions to value, valuation approach and other assumptions that have been made by the appraiser. Such restrictions should well defined and explained in the body of the report.

The critical importance of the Appraiser's report is determined by the following factors:

- It is the final step in the appraisal process;
- Represents the whole business in a single Value (communicates the value conclusion);
- Confirms the basis/purpose of the appraisal;
- Reflecting any assumptions or limiting conditions

The appraiser's report should meet the following requirements:

- Provide a Good Description of Property Which is Subject of an Appraisal report *(tangible, intangible assets, good will, legal rights, etc.)*
- State the Objectives of the Appraisal Work
  (determine a value, estimate a cost, forecast earning power, ascertain certain facts)
- State the Contingent and Limiting Conditions to which the Appraisal Findings are Subject
  (obtaining information/data from reliable sourced that could be verified, fractional, hypothetical, preliminary reports)
- Describe and Explain the Appraisal Method Used
- Provide Statement of the Appraiser's Disinterestedness
- Include of Dissenting Opinions
  (Supervising authorities, collaborating appraisers issuing joint report)
- Follow the General principles as explained above.

C**ommon errors in Appraiser's reports:**

- Failure to conform to Applicable Standard of Value
  - *to do "appraisal" without determining the Standard of Value*
  - *to determine one standard of value and to analyze for another and conclusion to be misconstrued*
- Internal Inconsistencies
  - *when you have feeling that they have been written by two or more people*
  - *the scope of valuation and assumed approach to value does not match the actual methodology used later on*
- Extensive and Irrelevant reports
  - *annoying fat reports fill with irrelevant information*
- Emphasis of Items Not in Proportion to Their Relative Importance
  - *especially when developing the earnings base, the capitalization and discount rates*
- Undefined Jargon
  - *use of abstruse or ambiguous terms without definition*
  - *each term used should be defined in a special appendix in order the reviewer to be able to determine whether goals of appraisal are met or not*
- Inadequate Comparative Data
  - *inadequate gathering or presentation of comparative transaction data*
  - *appraisal based on partial or inappropriate market data*
  - *lack of clear exposition in comparative analysis, including whther data had been adjusted, which one and for which period*
- Leaps of Faith
  - *presentation of fact or conclusion with no accompanying documentation, critical assertions should be carefully checked*

6. REVIEW OF APPRAISER'S REPORT

The reporting of the results of an appraisal review is one of the most critical efforts the professional review appraiser undertakes. The reviewer's efforts in forming and setting forth an opinion as to the completeness of the appraisal report under review may have little meaning if the opinion is not merged into a readable review report that presents facts and conclusions in a logical and concise manner.

The methodology for performing a technical review falls into two different types: desk review and field review. There may be a combination of the two resulting in a partial field review. The mechanics of the technical review will vary depending upon the scope or nature of the assignment, the client, policy requirements, or the nature of the property appraised.

The foremost concern and identified goal of every review appraiser is to secure approveable appraisals. A corollary responsibility of the technical reviewer is the management role of providing advice to institutions, loan officers, attorneys, and other clients.

GUIDELINES FOR PREPARING TECHNICAL APPRAISAL REVIEW REPORTS

Although not all reviewers organize their reports in the same manner, most review reports contain certain common features. The required common features are specified in the Uniform Standards of Professional Appraisal Practice (USPAP). Appraisal reviews that comply with all the requirements of USPAP are acceptable reviews from the standpoint of technical review content. The following sections provide information required by USPAP. These sections are recommended to members of the American Society of Farm Managers and Rural Appraisers writing demonstration technical appraisal review reports.

The Handbook of Technical Writing, Brusaw, Alred, and Oliu, St. Martin's Press, New York, New York, Fourth Edition, 1993, is an excellent reference book and guide that contains numerous examples of writing various portions of technical reports. Reviewers are encouraged to use Brusaw as a technical writing reference when preparing technical appraisal review reports.

Qualifications of the Review Appraiser

A review appraiser is an appraiser who examines the reports of other appraisers to determine whether their conclusions are consistent with the data reported and with other generally known information (The Dictionary of Real Estate Appraisal, Third Edition, 1993). Several less formal definitions characterize the duties of a review appraiser. The technical reviewer is an appraiser who reviews and analyzes the relevant facts assembled by the appraiser and, by the use of reason and exercise of judgment, forms an opinion or conclusion with respect to the real estate problem. The work of review appraisers can be summarized by saying they make a

thorough and detailed appraisal of appraisals submitted to them for review.

The reviewer is a state-certified general appraiser who is academically qualified in all appraisal techniques. State general certification implies a minimum level of education consisting of broad-based approved professional valuation courses. Additionally, the review appraiser should remain abreast of the profession by completing courses or seminars covering such topics as investment analysis, subdivision analysis, mineral property valuation, advanced case studies of a variety of property types, highest and best use analysis, or any suitable course work related to the types of appraisals the reviewer may be asked to technically evaluate.

Several years of specialized experience in the reviewer's field of employment is important to prepare the reviewer for the complexities of current appraisal assignments for a variety of clients. Court experience is helpful if the reviewer is expected to participate in judicial proceedings as an expert witness. Administrative or consulting duties in the reviewer's field of employment help round out the full range of valuation opportunities to which the reviewer may be exposed.
Some positive personal traits of a review appraiser should include good verbal and written communication skills and the ability to convince, train, and persuade others. Exhibiting mature judgment by not nitpicking a report to death nor, conversely, rubber-stamping reports is a desirable quality.

The reviewer should have the ability to read between the lines, which often is a characteristic associated with logical, analytical methods of evaluation; closely akin to being intuitive. Above all, the review appraiser must have the confidence to authoritatively review another's work and provide constructive criticism in a tactful, responsible manner. Ultimately, the review appraiser must demonstrate competence, objectivity, fairness, and integrity as a professional.

The reviewer's assignment is to make certain the correct property was appraised. This objective is not as simple as it might seem at first blush. In addition to assuring the legal description is correct, the reviewer must know the estate to be appraised and ascertain if the appraiser has properly delineated the various sticks in the bundle of rights. These steps can only be accomplished when the reviewer is fully aware of what the appraiser's assignment was. An appraisal review does not have to find something wrong with each appraisal report.

To ensure objectivity and independence in the review process and to preclude the appearance of conflicts of interest or wrongdoing, review appraisers should not:

- be responsible for negotiating the sale, purchase, or loan approval of the appraised property;
- review an appraisal prepared by the reviewer's supervisor;
- review an appraisal of a property personally and recently appraised by the reviewer;
- review an appraisal prepared by someone who has recently reviewed your appraisal work; and
- participate in any appraisal or review activities which could give the appearance of a conflict with the Ethics Provision of the USPAP.

As with appraisers, the reviewer must not become an advocate. The reviewer's task is to objectively evaluate the technical aspects of the appraisal.

Review Procedure

The review appraiser must first become familiar with the assignment, the appraisal report, and the appropriate market area. Such familiarity is best achieved by reviewing the data presented and examining the appraised property and comparable sales. Field review with the appraisal report in hand is akin to a mental reappraisal of the property by the reviewer.
Personal understanding of local economics which affect the real estate market is particularly useful. The reviewer is responsible for checking computations, the estate being appraised, deeds or options when provided, size, maps, or construction plans. The reviewer must evaluate the appraiser's qualifications; identify any legal matters needing resolution; and study the information, data, and analysis presented for qualitative and quantitative adequacy. Only then can the reviewer determine if the report conforms with law, regulations, institutional or agency standards, and USPAP.

Before approving an appraisal report, the reviewer must:

1. Read the appraisal report in its entirety, taking notes on items which will require further evaluation or meriting special mention in the review report. Ensure that the correct property is appraised; the estate appraised and the legal description in the final appraisal (as supplemented or amended) are identical to the property rights under appraisal.
2. Determine if the facts cited are correct, if the assumptions are valid and necessary, if the analysis and approaches are properly processed, and if the appraiser did a thorough job. Are the sales really comparable or cost estimates reasonable?
3. Analyze and correlate all facts and information available (within the appraisal report or otherwise obtained) to help evaluate the acceptability of the appraisal and value estimate. Has the appraiser properly applied the traditional tests of highest and best use?
4. Ascertain whether the value estimate is reasonable and supported by the appraisal, as well as other information available.
5. Strive to have all appraisal reports prepared to required standards and be unwilling to accept anything less than a fully supported appraisal report.
6. Ensure that you are competent or associate with a reviewer who is competent to evaluate specialist reports regarding resource appraisals (such as timber, water rights, or minerals) or other valuation peculiarities.
7. Approve or recommend for approval the estimates in compliance with institutional or agency policy.

Following evaluation of the appraisal, the review appraiser must prepare a written review in compliance with USPAP Standard 3 to document findings and support the reviewer's conclusion. The review appraiser should comment on the strong and weak points of the appraisal report and, as necessary, provide supplemental data and analysis. Finally, the reviewer approves, accepts without approval, disapproves, recommends, or becomes the appraiser for the assignment.

The level and type of review should be predefined. No misunderstanding should occur with respect to the type or review requested by the client. The scope of the review should be clearly stated to the client at the outset.

Methods of Appraisal Review

There are generally three accepted methods for preparing a technical appraisal review: detailed (narrative), exceptional, and form. The narrative appraisal review report provides a detailed explanation of all facets of the review process from recitation of the assignment and summarizing key components of the property being appraised to itemized comments describing deficiencies or items worthy of particular commendation. This positive system summarizes the important elements of the appraisal, usually commenting on all parts of the appraisal, and records the reviewer's actions, analysis, and conclusions. This is the type of technical review required for the Real Property Review Appraiser (RPRA) demonstration appraisal review report.

Conversely, the exceptional system of appraisal review records only significant and exceptional findings and action taken by the reviewer. Reviews by exception must still comply with USPAP Standards Rule 3-2 regarding content, albeit in an abbreviated format compared with the detailed review. The exceptional system is often used for higher-level reviews within an organization when the first-level review is a narrative review report.

A form review further abbreviates the documentation associated with reviewing an appraisal report. The form review does not abbreviate the process. Forms are developed for specific institutional or agency needs and the Standard Appraisal Review Report form is becoming more widely accepted by many users. Use of a form review requires only that the reviewer summarize some very basic information about the property which was appraised, then respond positively or negatively regarding each item printed on the form. There is opportunity to elaborate for items requiring special mention or clarification.

A tool which is useful for all three types of reviews is an appraisal review checklist. Checklists help a reviewer systematize the review process and ensure that no section is inadvertently overlooked to help assure that the appraisal complies with the client's requirements. Strict adherence to a checklist, however, may be overdone and can result in the qualitative aspects of the appraisal report being shortchanged. The checklist does not determine the acceptability or unacceptability of the appraisal. It should merely be a tool to help the reviewer systematize the review process. Currently, no single review checklist is universally accepted. Most checklists are tailored to the specific criteria of the institution or agency that uses them.

Generally, an appraisal review need not duplicate the work that was adequately performed in the appraisal. The review report merely needs to summarize the appraisal so an individual can read the review and have a good idea of what the appraisal contains and how well it complies with the standards under which it was prepared.

As referenced earlier, technical reviews may be a desk review, a field review, or a partial field review. Following is a description of the major characteristics associated with these types of technical reviews:

Desk review

- typically made without field inspection of the appraised property or the sales used in the analysis
- a review checklist is often used by the reviewer
- data contained within the appraisal report may or may not be confirmed

- additional competitive market data are not usually identified by the reviewer
- calculations in the report are checked for accuracy
- appraisal principle application and techniques are evaluated for their appropriateness
- may include confirmation of compliance with a particular client's policy requirements
- normally conducted by government agencies, lending institutions, and others as a check on the appraisal process
- may result from a professional appraisal organization verifying a candidate's experience

Field review

- the most significant difference between a desk review and a field review is the level of evaluation; in addition to the above, field review includes at least
- an exterior (if improvements are involved) property inspection of the appraised property and the sales used in the analysis
- data contained within the appraisal report are usually confirmed with independent sources
- additional competitive market data may be identified and analyzed by the reviewer

Partial field review

- may include inspection of only the appraised property or the sales, only the most comparable sales, or some combination less than a full field review

Reviewer's Options and Actions

Despite the reviewer's primary objective of securing an approveable appraisal, there are several options available to the reviewer if the report under review is deficient. At the outset of an assignment, the review appraiser must clearly understand the consequences of approving or disapproving an appraisal. The most common actions a reviewer may take when reviewing an appraisal are: 1) approval, 2) acceptance without approval, 3) disapproval, 4) recommending one of these actions to someone else with approval/disapproval authority, or 5) the reviewer becomes the appraiser.

Approval

The review appraiser should approve or recommend for approval the appraisal report if it is prepared to existing standards, follows current corporate or agency policy, is based upon the proper premises, adequately supports the value estimate, is consistent with the review appraiser's personal knowledge, and is in compliance with Standard 2 of USPAP. The reviewer may not approve an appraisal with speculative or unreasonable limiting conditions and assumptions.

The review appraiser must not approve substandard reports. Significant weaknesses, differences, and divergences noted during the current review, or previous reviews, or the appraisal must be resolved. The reviewer must document that previously noted deficiencies, weaknesses, or questions have been corrected or clarified.

The review appraiser must not approve an inadequate report or an inadequately supported value estimate unless the reviewer can support the value estimate with personal analysis of facts and data cited in the appraisal, or from other independently derived information. The

reviewer may add vital support to the appraisal by providing supplemental information or analysis and may approve the appraisal report citing the additional data or analysis as support so long as the appraiser's value estimate is not changed. When the review appraiser does identify the need for supplemental information or analysis, the reviewer must first attempt to have the appraiser of record improve the report to an acceptable standard. Each appraisal report should be sufficiently complete and thorough to support itself. While this is not always possible, the record must show that the value estimate is supported.

Accept the Appraisal Without Approval

It is possible for an appraisal to be technically acceptable although the value estimate is in doubt or unconvincing. In such cases, the review appraiser may accept an appraisal without approval. Such acceptance must be followed by, or in conjunction with, an action to approve a better-supported appraisal report or to obtain another appraisal report to substantiate, support, or replace the original appraisal report. Approving one appraisal report over another "acceptable" report, where the divergence in value estimates is within acceptable parameters, constitutes acceptance without approval of the unapproved report. The reviewer must clearly state and support the reasons for approving one report over another.

Disapproval

If, after diligent efforts have been made to get the needed support and improvements to an appraisal under review, the report still does not meet acceptable standards and the value estimate is not adequately supported, the review appraiser should disapprove the appraisal report with full documentation of the bases for disapproval.
Some states require their state-certified and state-licensed appraisers to report (often under statutory immunity) any real estate appraiser who has acted in a manner which does not meet the generally accepted standards of professional appraisal practice. Additionally, some states require reporting of real estate appraisers who have performed appraisal services beyond their level of competency. Reviews which disapprove an appraisal report should be written with state reporting requirements in mind so the report may be provided to the state licensing authority.

Recommendation

Some clients, agency and institutional, reserve technical approval/disapproval authority to a manager who may not be a review appraiser. In these situations, the reviewer completes the review report as outlined previously, but concludes with a recommended action to management rather than actually approving or disapproving an appraisal report.

Reviewer Becomes the Appraiser

In certain situations, but only as a last resort, the review appraiser may RECOMMEND (not

approve) a value estimate or estimate of just compensation different from that cited in the appraisal report under review. The reviewer may recommend such a value when all of the following apply:

1. Despite diligent efforts to improve the report, the problem still cannot be resolved satisfactorily with the appraiser of record;
2. The review appraiser still cannot concur with the appraiser's estimate; and
3. Obtaining another appraisal is not feasible or economical.

The review appraiser may then make a different estimate of value. That value estimate is a second appraisal. The new estimate is the sole responsibility of the original reviewer; now appraiser. The original reviewer may cite and support the new estimate in the appraisal review report, using the original appraisal report as the foundation. Or, the reviewer may prepare a separate, self-supporting appraisal report. In either event, the documentation must comply with USPAP Standard 2.

Recommending a new estimate of value does not constitute changing an appraisal report. The original review appraiser's new estimate of value must be reviewed at the next higher level for the clients who allow this option.

Technical Review Report Format

Following is a suggested technical review report format for appraisals meeting the requirements for RPRA accreditation. The demonstration review report should reflect the advice provided in these guidelines.

TECHNICAL APPRAISAL REVIEW

The appraisal report for the (property)

was prepared by (Name, title, company, address) .

(Identify the client requesting the review report and intended users of the review report.)

1. Appraisal Summary. (This section is mandatory; include each item appropriate for the property appraised.)

   a. Owner of Record.
   b. Estate Appraised.
   c. Size of Subject or (1. Larger Parcel). (2. Size of Right-of-Way or Easement).
   d. Highest and Best Use or Permitted Use (1. Before Taking). (2. Highest and Best Use After Taking).
   e. Improvements.
   f. Date of Value.
   g. Value of Total Property. (Identify and give estimated value(s) for major items such as land, timber, improvements, damages, benefits, and just compensation.)

2. Scope of Review. (Include the following statement with relevant options.) My review of this appraisal is based on the materials submitted in the report, discussions with the appraiser, discussions with (identify anyone consulted pertinent to the review), and my personal knowledge of the local real estate market. As the review appraiser, I made (no field review/a partial field review/a full field review.
3. Property Data Summary. Briefly describe size, location, configuration, vegetation cover, improvements, topography, access, water influence, available utilities, view and any other amenities. State the current use. Summarize and comment on the adequacy of the highest and best use analysis.
4. Estate Appraised. Define the estate as fee simple, right-of-way, scenic easement, or permitted use, and, if a partial estate, describe the impacts of any project.
5. Valuation. Include approaches to value, last sale of subject, number of comparables, factors that influence value, appraiser's analysis, and value conclusions.
6. Comments and Recommendations. Comment on overall quality of report and market support of conclusions. Cite high and low points, if applicable. Recommend/approve the value conclusion or, if appropriate, disapprove. If disapproved, cite specific fatal deficiencies and indicate how they can be rectified.
7. Certification. Include a certification in compliance with the standards under which the review report is prepared.

I approve the value estimate of $XXX,XXX for the (name of owner or other identification) property, as of (date of value).

Approving Review Appraiser's Name Date Title

GENERAL SUGGESTIONS

The technical appraisal review report reflects professionalism as an appraiser. Organize the report in a logical manner consistent with USPAP Standard 3 clearly stating the facts, assumptions, and conclusions. The importance of correct spelling, grammar, punctuation, and sentence structure cannot be overemphasized.

The following suggestions may also be helpful:

- have the report proofread carefully, referably by someone not involved in writing the report
- rarely are first drafts acceptable as final products. Edit the report carefully to make
- sure the technical review is being presented in a concise, clear manner
- type the report, use a word processor, or have it professionally printed
- separate sections of the review to enhance the report's appearance
- always number all pages
- avoid using technical terms prior to defining those terms.

APPENDIX 1: QUICK REFERENCE GUIDE ON APPLICABILITY OF COMMON VALUATION METHODS

The next table presents the main features of the most common valuation methods:

Category	***Advantages***	***Disadvantages***	***Application Field***
DCF valuations	Since DCF valuation, is based upon an asset's fundamentals, it should be less exposed to market moods and perceptions. If good investors buy businesses, rather than stocks, DCF valuation is the right way to think about what you are getting when you buy an asset. DCF valuation forces you to think about the underlying characteristics of the firm, and understand its business. If nothing else, it brings you face to face with the assumptions you are making when you pay a given price for an asset.	Since it is an attempt to estimate intrinsic value, it requires far more inputs and information than other valuation approaches These inputs and information are not only noisy (and difficult to estimate), but can be manipulated by the savvy analyst to provide the conclusion he or she wants. In an intrinsic valuation model, there is no guarantee that anything will emerge as under or over valued. Thus, it is possible in a DCF valuation model, to find every stock in a market to be overvalued.	This approach is easiest to use for assets (firms) whose: ❑ Cash flows are currently positive and ❑ Can be estimated with some reliability for future periods, and ❑ Where a proxy for risk that can be used to obtain discount rates is available. It works best for investors who either: ❑ Have a long time horizon, allowing the market time to correct its valuation mistakes and for price to revert to "true" value or ❑ Are capable of providing the catalyst needed to move price to value, as would be the case if you were an activist investor or a potential acquirer of the whole firm
DFEV valuation	The essence of the DFEV method is to judge the firm's value in several years, when it has recovered, relying on a business plan, and then to discount the value obtained by a discount rate equal to the expected return rate on equity. Unlike the current multiples method, this method can work with the present value of the future parameters, to whom the current multiples could be applied. DFEV could offer a better image of the value when the biases of the current market prices are very likely.	It assumes a relative high complexity both for: ❑ Deriving the financial statements of the company till the year when useable figures are obtained through a business plan ❑ Getting the right multiples for calculation of the value	The Deferred Future Equity Value (DFEV) method is the most appropriate one to evaluate a company in a difficult situation. It is also applicable whenever, from different reasons, is difficult to isolate the cash flows either to company or to shareholders.

Category	Advantages	Disadvantages	Application Field
Relative valuations	Relative valuation is much more likely to reflect market perceptions and moods than discounted cash flow valuation. This can be an advantage when it is important that the price reflect these perceptions as is the case when The objective is to sell a security at that price today investing on “momentum” based strategies With relative valuation, there will always be a significant proportion of securities that are under valued and over valued. Since portfolio managers are judged based upon how they perform on a relative basis (to the market and other money managers), relative valuation is more tailored to their needs Relative valuation generally requires less information than discounted cash flow valuation (especially when multiples are used as screens)	A portfolio that is composed of stocks, which are under valued on a relative basis, may still be overvalued, even if the analysts’ judgments are right. It is just less overvalued than other securities in the market. Relative valuation is built on the assumption that markets are correct in the aggregate, but make mistakes on individual securities. To the degree that markets can be over or under valued in the aggregate, relative valuation will fail. Relative valuation may require less information in the way in which most analysts and portfolio managers use it. However, this is because implicit assumptions are made about other variables. To the extent that these implicit assumptions are wrong, the relative valuation will also be wrong.	This approach is easiest to use when: ❑ There are a large number of assets comparable to the one being valued ❑ These assets are priced in a market ❑ There exists some common variable that can be used to standardize the price This approach tends to work best for investors: Who have relatively short time horizons Are judged based upon a relative benchmark Can take actions that can take advantage of the relative mispricing;
Assets based valuations	Generally, they require less forecast efforts, the current value of each asset and liability being estimated at its separate market price. The assets & liabilities reflected at historical cost could be a good estimate of the market value when the market prices are stable over long horizons.	The forecasting efforts are replaced by the individual assessment of each item belonging to the company's patrimony estimated at its replacement cost or net realisable value. This method renounce to contemplate the going concern value of the assets. The estimated value is strongly affected by the existing moods of the market, being very volatile.	Its applicable to that companies which: ❑ Could not preserve the actual going concern of the business ❑ The current & future performances are not likely to be improved ❑ The company operates far below its designed production capacity

APPENDIX 2: RATIOS - QUICK REFERENCE GUIDE

1. Current Ratio = Current Assets / Current Liabilities

2. Acid Test Ratio = Quick Ratio
   = Quick Assets / Current Liabilities
   = (Current Assets - Inventories) / Current Liabilities

3. Total Asset Turnover = Sales/Total Assets

4. Tangible Asset Turnover = Sales / Total Tangible Assets
   = Sales / (Total Assets - Intangible Assets)

5. Accounts Receivable Turnover = Net Credit Sales / Accounts Receivable

6. Inventory Turnover = Cost of Goods Sold / Inventory ; can also be = Sales/ Inventory

7. Fixed Asset Turnover = Sales / Net Fixed Assets

8. Days Sales Outstanding = Average Collection Period $= \frac{\text{Notes and Accounts Receivable}}{\text{Average Daily Credit Sales}}$

9. Average Daily Credit Sales = Credit Sales / Number of Days often assume 360 days to year.

10. Days Purchases Outstanding =Average Payment Period $= \frac{\text{Accounts Payable}}{\text{Credit Purchases Per Day}}$.

    sometimes use $= \frac{\text{Accounts Payable}}{\text{Cost of Goods Sold Per Day}}$

11. Total Debt to Total Assets - Total Debt / Total Assets
    (called the debt ratio)

12. Total Debt to Tangible Assets = Total Debt / Total Tangible Assets

13. Total Debt to Net Worth = Total Debt / Net Worth

14. Total Debt to Tangible Net Worth = Total Debt / (Net Worth - Intangible Assets)

15. Equity Multiplier = Total Assets / Common Equity where common equity equals the sum of capital stock, paid-in-excess of par and retained earnings.

16. Capitalization Ratio = Total Debt / (Total Debt + Preferred + Common Equiity)

17. Times Interest Earned = Earnings Before Interest and Taxes(EBIT)
Interest Charges

18. Fixed Financial Charge Coverage
= EBIT and Lease Payments
Interest + Lease Payments+ Preferred Dividends (tax adjusted)+Sinking Fund Payments (tax adjusted)

Preferred Dividends (tax Adjusted) = (Preferred Dividends)/(1-t)

Sinking Fund (tax adjusted) = (Sinking fund)/(1-t)

19. Cash Flow Overall Coverage Ratio
= Net Operating Income+Lease Expense + Depreciation
Interest+Lease Expense+Preferred Dividends (tax adjusted) + Sinking Fund Payments (tax adjusted)

20. Gross Profit Margin = Gross Profit /Sales

21. Operating Profit Margin = Operating Profit /Sales = EBIT/Sales

22. Net Profit Margin = PM = Net Income Available to Common Stockholders/Sales

23. Price-Volume Ratio Ratio = Contribution Marginn /Sales
= (1 - VS/S) = (1 - vc)

24. Basic Earning Power Ratio = Operating Income Return on Total Assets
= EBIT/Total Assets
(may be related to total tangible assets)

25. Return on Total Assets = Net Income Available to Common Stockholders/Total Assets
(may be related to total tangible assets) = **ROA**

26. Return on Common Equity = Earnings Before Taxes - Taxes - Pref. Div.
Common Equity

= Net Income Availvable to Common Stockholders = **ROE**

Common Equity

26' Return on Equity (Total) = Net Profit After Taxes(NPAT)
Total Equity

27. Dividend Yield = Dividends per Share of Common Stock / Market Price per Share of Common Stock

28. Earnings Per Share of Common Stock
= Earnings before Taxes -Taxes - Preferred Dividends / Number of Outstanding Shares of Common Stock

29. Earnings Yield = Earnings Per Share of Common Stock / Market Price Per Share of Common Stock

30. Payout Ratio = Cash Dividends Paid to Common / Earnings Before Taxes - Taxes - Preferred Dividends

31. Price-Earnings Ratio = Market Price Per Common Share/E.P.S.

32. Market/book Ratio = Market price per Share of Common/Book value per Share of Common

33. Breakeven Quantity = Total Fixed Costs/(Price - Per Unit Variable Costs)

34. Approximate Sales Volume
Needed to Cover Operating = Total Fixed Costs / 1 - Total Variable Operating Costs

Actual Sales

$S_{BE} = FC/(1 - vc)$ where $vc = vc_i/S_i$

35. Degree of Operating Leverage = Percentage Change in Operating Income / Percentage Change in Units Sold (Sales)

Degree of Operating Leverage = Contribution Margin / Contribution Margin - Fixed Operating Costs

$$= \frac{S - VS}{S - VS - FC} = \frac{S - VC}{EBIT}$$

Degree of Operating Leverage = $\frac{Q(p - v)}{Q(p - v) - FC}$

Degree of Operating Leverage = $\frac{Q}{(Q - Q_{BE})}$

36. Degree of Financial Leverage = Percentage Change in E.P.S / Percentage Change in Operating Income

$$\text{Degree of Financial Leverage} = \frac{EBIT}{EBIT - I} = \frac{EBIT}{S - VC - FC - I}.$$

$$\text{Degree of Financial Leverage} = \frac{\text{Operating Profit}}{\text{Net Profit After Taxes and Preferred Dividends}} \times \frac{(1 - t)}{1}$$

37. $$\text{Degree of Total Leverage} = \frac{\text{Percentage Change in E.P.S.}}{\text{Percentage Change in Units Sold (Sales)}}.$$

$$\text{Degree of Total Leverage} = \frac{S - VC}{S - VC - FC - I}.$$

$$\text{Degree of Total Leverage} = \frac{\text{Contribution Margin}}{\text{Earnings Available}} \times \frac{(1 - t)}{1}$$

Degree of Total Leverage = DOL x DFL

38. Margin of Safety = Operating Profit / Contribution Margin

39. Dupont Financial Analysis (Two Forms, one with EBIT and one with NIACS

$$\frac{EBIT}{\text{Total Assets}} = \frac{EBIT}{\text{Sales}} \times \frac{\text{Net Sales}}{\text{Total Assets}}$$

$$= \text{Margin} \times \text{Turnover}$$

$$\frac{\text{Net Profit After Taxes}}{\text{Total Assets}} = \frac{\text{Net Profit After Taxes}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$$

$$= \text{Margin} \times \text{Turnover}$$

(may be related to total tangible assets)

APPENDIX 3: SAMPLE CONTENT OF APPRAISER'S REPORT

1. Introduction
   - Description of the Assignment
     - Who was retained by whom to do the appraisal
     - Applicable standard of value
     - Definition of the property being appraised
     - Effective date of the appraisal
     - Purpose or purposes of the appraisal
   - Summary description of the company
   - Capitalization and ownership
   - Definition of applicable standards of value
   - Sources of information
   - Valuation approach or approaches and conclusion
2. Economic Data (relevance)
3. Industry Data (sector analysis)
4. Description of the Company
   - Background
   - Operations
   - Management
   - Ownership
   - Past Transactions (stock/assets)
   - Summary of Positive and Negative factors
5. Comparative Transaction Data
6. Financial Statement Analysis
7. Valuation Approaches and Conclusion
   - Discussion of valuation approaches
   - Description of the procedure, data, and results for each approach used
   - Relative weight to be accorded the various approaches
   - Premiums and/or discounts, if applicable
   - Summary and conclusion
8. Prefatory Material and Appendixes
   - Statement of Appraiser's Disinterest
   - Assumptions and Limiting Conditions
   - Qualifications of Appraisers
   - Other Appendixes

APPENDIX 4: SAMPLE CONTENT OF INSTRUCTIONS AND GUIDELINES FOR APPRAISAL REVIEW

GENERAL REMARKS

This information is assembled to aid and direct the review appraiser. Adherence to these instructions will help insure a proper and adequate review insofar as the appraisal reports are concerned.

Both appraisers and review appraisers must have open minds and flexibility of thought, and refrain from becoming advocates. Their minds should be clear of all biased or unsupported opinions of value. Impersonal analyses of all available data and information are essential to the reviewer's function.

Ethical conduct is just as important to the reviewer as to the appraiser. Standards governing the actions of professional appraisers should be followed by the review appraiser.

The reviewer determines the acceptability of appraisal reports on the following basis.

1. Form
2. Adequacy of data
3. Quality of data
4. Accuracy of data
5. Choice of approaches
6. Properly developed techniques
7. Adequacy of Analysis
8. Correlation of information
9. Reconciliation of conflicting or contradictory information.

The reviewer should be satisfied that the report constitutes an accurate portrayal of the property appraised and that all major value factors have been considered.

A primary responsibility of the reviewer is the final estimate of compensation. In the event he disagrees with the appraiser's values, he must provide support for his opinion. Unsupported and undocumented opinion should never replace one which is documented.
The mechanics of the review should follow a logical and orderly sequence of actions to produce the desired results. A portion of these actions must be performed in the field as well as the office. Sufficient time should be allowed for each phase to bring the review to a satisfactory conclusion.

The reviewer should use all available tools and information throughout the review process. The following is a partial list of the accessory information which can be utilized:

1. Title facts
2. Official plans (property maps, plan and profile, typical sections, cross-sections, etc.)
3. Aerial photographs

4. Project report
5. Leases
6. U.S.G.S. Maps
7. A.S.C.S. Maps

Review procedures set out on the following pages are applicable to the majority of properties regardless of use.

COMPARABLE SALES REPORT (Office Review)

The review appraiser must comply with the following:

1. Check contents to determine that all data is included to meet the current requirements.
2. Check all mathematical computations.
3. Determine the significance of any errors. If the errors will have a significant effect on values in the appraisal reports, the appraiser should be notified so that appropriate corrections can be made to both the sales report and the appraisal reports where the sale was used.
4. Study the narrative portions in order to understand the basis of adjustments.

REVIEW PROCEDURE NO. 2

COMPARABLE SALES REPORT (Record Check)

The review appraiser should follow the points listed below:

1. Confirm factual data which can be found in the public records. (Sales date, deed book, page number, grantor, grantee, location, size, etc.)
2. Check comparable leases and rentals if recorded.
3. Be satisfied that the recorded data contained within the sales book is reasonably accurate.

REVIEW PROCEDURE NO. 3

COMPARABLE SALES REPORT (Field Inspection)

The review appraiser must comply with the following:

1. Make a visual inspection of all sales except those which are remote or impractical to visit. There are situations where sales not used may be better comparables than those selected by the appraiser.
2. Confirm with a knowledgeable person the sales date, sales price, grantor, grantee and conditions relative to the most frequently used sales. (Were items of personal property and/or fixtures included in the sales price? Did the price include more than one tract? Was excessive motivation present in the transaction, etc.?). The scope of these confirmations should be to the extent the review appraiser is comfortable with.
3. Check the breakdown of the component parts of the sale as analyzed by the appraiser

(improvements, land classification and allocation, special land improvements). Any reasonable doubt concerning the adequacy and/or accuracy of the information at hand should be resolved to the reviewer's satisfaction.

4. Determine which sales are keyed to important value factors (time, location, topography, size, etc.). These sales must be confirmed and inspected to the reviewer's satisfaction. Special effort should be made to determine whether the appraiser's analyses are logical and reasonable.
5. Check the consistency of the appraiser's analyses. If reasons for any major deviations are not apparent, additional information may be required from the appraiser.
6. Always remember that appraisal reports are a direct reflection of the data contained within the comparable sales. If the sales data is erroneous, inaccurate or distorted, the appraisal reports will suffer accordingly.

REVIEW PROCEDURE NO. 4

INITIAL SUBMISSION (Contract Compliance and General Acceptability)

Review appraisers are responsible for determining whether or not a contract appraiser is eligible to receive incremental payments; therefore, they must:

1. Determine that the parcels received coincide with those on the invoice.
2. Check the number of appraisal reports for contract compliance.
3. Check type of report received against type specified in the contract.
4. Check for extra photographs for improvement records.
5. Check mathematical computations on invoice.
6. Inform the Right of Way Supervisor or Project Manager of his determination.
7. Approve the invoice and submit for payment.

CHART PREPARATION

NOTE: This procedure may not be applicable to all projects. After consideration of the number of sales, the number of parcels and the types of properties involved, the reviewer's judgment should determine the type and number of charts which will fit his particular need or the needs of the project involved.

1. Where applicable, charts of the comparables should be prepared by the reviewer for quick reference throughout the review process.
2. A chart of the number of times each sale is used should be prepared. This will determine the depth of inspection needed for each comparable. Sales used many times warrant a more careful inspection than those used only a few times.
3. Charts of subject parcels made in a fashion similar to those prepared on the comparables can help determine consistency within appraisals.

REVIEW PROCEDURE NO. 6 APPRAISAL REPORTS (Initial Office Review) The review appraiser **must** comply with the following:

1. Check mathematical computations or delegate a competent and knowledgeable person to do so. (Professional judgment should determine whether errors are significant to justify return to the appraiser for correction.)
2. Check parcel numbers, project numbers, owners, areas and item numbers shown in reports against the same information on the official plans. Differences should be explained in the report or by the reviewer**.** Areas and acquisitions must correspond with summary sheet of the plans furnished the appraiser.
3. Check valuation dates, dates of inspection and appraiser's signature for compliance with current appraisal instructions.
4. Determine that the descriptive narratives are adequate.
5. Determine compliance with standards and requirements of the Federal Highway Administration. The reports must comply with *Appraisal Guidelines* compiled by the Division of Right of Way and Utilities.
6. Read enough of the report to determine one's ability to follow the appraiser's reasoning. This is important where it pertains to the adjustments used in the Cost and Sales Comparison Approaches. Particular attention should be given to the descriptions and estimates of damage to the remainders.
7. At this point, it is appropriate to approve the 30% invoice for payment if the reports are in acceptable form.

REVIEW PROCEDURE NO. 7

APPRAISAL REPORTS (Field Inspection)

Review appraisers must perform the following:

1. Contact owner and/or occupant prior to inspection of subject when possible or practical.
2. Make a visual inspection of the proposed acquisition. Site improvements within the taking should be observed and considered regardless of whether these items appear on the plans.
3. Make an exterior and interior inspection of any major improvements which are taken or damaged.
4. Determine that the information concerning buildings taken or damaged is reasonably accurate. Area, quality, type of construction, depreciation, etc., become more important when the cost approach is the only one used and/or relied upon.
5. At the time of field inspection, evaluate present use and highest and best use. Any anticipated change of highest and best use should be studied and analyzed in the field at this time.
6. Spend adequate time on each parcel to eliminate the need for subsequent inspections. Properly prepared field notes on each parcel provide a valuable source of information for the final desk review.

The review appraiser should observe the following:

1. Sketches and photos to assure they are reasonable representations of the property.
2. Physical attributes affecting value such as access, drainage, railroads, sidings, terrain, easements, natural barriers, etc.
3. Utilize information contained in the property map, plan and profile sheets and cross-sections.

APPRAISAL REPORTS (Final Office Review)

The review appraiser is required to do the following:

1. Reconcile any discrepancies between the results of the onsite inspection and the contents of appraisal reports.
2. Systematically check the documentation of the Cost Approach. This includes the cost source, base unit values, applicable modifiers, variations from base cost and depreciation applied to the improvements. This check should also include documentation and adjustments to the land value plus the cost source and contributing value of the site improvements.
3. Analyze the documentation of the Income Approach which includes the capitalization technique, economic rent, expenses, economic life of the buildings and capitalization rates. Any difference in economic rent and contract rent must be addressed.
4. Check sales information contained in the appraisal report against the corresponding data contained in the sales/data book or sales report. Adjustments applied in the Sales Comparison Approach should be checked for documentation and/or justification contained in the sales report. All adjustments should be supported in compliance with the *Appraisal Guidelines*.
5. Review for final value estimate the "Justification of Value Used" and "Correlation of Approaches."
6. Check allocation of values. All allocations should approximate or support the indicated values in the approach which is relied upon.
7. Determine that the narrative descriptions of the taking and remainder(s) are adequate and reasonable.
8. Analyze the explanations justifying items of damages and/or enhancements. The reviewer should understand fully the method employed by the appraiser to determine the monetary consideration for damages and/or enhancements. The documentation and/or justification for this monetary consideration should satisfy current requirements.
9. Give proper attention to the "after value" documentation since it is as important as the "before value" documentation.
10. Assume responsibility for recommending an estimate of just compensation for approval.
11. Contact the District Property Management Agent for a determination of the salvage value of real property within the area of the acquisition.

The review appraiser should take the following action:

1. If, in the reviewer's professional opinion, errors/omissions will have significant effect on the value estimate, the appraiser should be required to make appropriate corrections. Minor errors and omissions may simply be noted in the review document as having no effect on final value conclusions.
2. Appraisal reports containing improperly developed approaches and techniques must be returned to the appraiser to be properly prepared for resubmission. Any estimate of value outside the range of indications is not acceptable. Further, an appraisal may be rejected in its entirety if the report conflicts with the facts to the point of incredibility.
3. Always review the total report before returning it to the appraiser. Additional information and/or documentation may be requested from the appraiser without returning the complete report.
4. The reviewer should not spend an excessive amount of time trying to make the report

acceptable. If changes to the estimate of compensation are made because of differences of opinion, these must be supported.

5. If an appraisal is returned to the appraiser, the major reasons for the return must be specified and the proper information requested. Minor errors and/or deficiencies may be noted for information purposes with no specific action requested.
6. The reviewer should request second or third appraisals through the Central Office when it becomes obvious such is needed to reach a fair and equitable value conclusion.
7. The final invoice of 20% can be approved at this point if the reports meet the requirements of the Transportation Cabinet.

APPRAISAL REPORTS (Two or More for Same Property)

The review appraiser must comply with the following procedures:

Dual Appraisals Required -When two appraisals have been made on one parcel or a property owner has submitted a report for review, the Review Appraiser must determine the acceptability of each as to procedure, standards and methods outlined in instructions provided to the appraisers.

If one appraisal is unacceptable, it must be returned for correction before final review of that parcel. If both appraisals are acceptable, the Reviewer must determine which appraisal presents the best documentation and most reasonably reflects compensation to be paid.

In the review of dual appraisal reports, the Review Appraiser will review each one individually and complete a review for each. One of the reports must be selected as the basis for compensation. There will not be a reconciliation of the two reports into a third value estimate based on parts taken from the two reports.

The review of the recommended report will note that it has been selected as most representative of fair market value and the amount of compensation will be stated at the bottom of the review sheet. No mention of the other report shall be made. The Review Appraiser's recap sheet will accompany only this review.

The review of the report that was not recommended will discuss the reasons why it is not recommended and make note of the superiority of the other report. The review sheet on this report will not carry a recap sheet and will not have a recommended value.

The summary sheet covering the two reports will carry only the recommended value.

REVIEW PROCEDURE NO. 10

APPRAISER PERFORMANCE ANALYSIS

The review appraiser must comply with the following:

1. Submit an Appraiser Performance Analysis on every appraiser, both fee and staff, on projects of more than six parcels. On projects of less than six parcels, the analysis is

submitted only if the project is of major complexity and a fair rating can be made from representative appraisal reports.

2. Complete this form as soon as the review is finished on that particular appraiser's assignment.
3. Be candid and do not let personal feelings influence this analysis in any manner.
4. Notify staff appraiser of rating. This information, or constructive criticism, should be beneficial to the staff appraiser for improving his ability and techniques.

These analyses are maintained in Central Office files to assist in evaluating appraiser's past performance. This is helpful in determining which appraisers will be asked to submit proposals on upcoming projects.

GENERAL PROCEDURES

FEE APPRAISER MEETINGS PRIOR TO BEGINNING ASSIGNMENT:

The letter requesting proposals from fee appraisers states, in part, "The review appraiser who will be assigned to review this project will contact you soon after receipt of this letter to arrange a pre-assignment meeting." This meeting is to discuss such things as the project itself, type of reports to be submitted, special problems that may be encountered, types of data and analysis required and forms to be used. This meeting should be conducted by the review appraiser who will review the reports and, ideally, by the review appraiser who prepared the project report. This meeting lets the fee appraiser know what is expected from him and what he can expect from us so that fees can be set accordingly.

The letter requesting proposals from fee appraisers also states, in part, "At two different times during the course of the project, the review appraiser will contact you to arrange a meeting to discuss the progress of the assignment and problems that you may have encountered. These meetings will typically be just before the scheduled submission of the data book(s) and just before the scheduled submission of the first appraisal reports. These meetings are required as a part of this assignment." The letter shall also advise the appraiser that copies of the appraisal report(s) on this assignment may be released to the property owner and/or the owner’s designated representative.

Subsequent meetings may be required to discuss problems that can arise, methodology being employed and general progress toward the completion date. The major reason for problems with reports in review is a lack of communication between the appraiser and review appraiser before the reports were submitted. The primary reason for having the data books submitted early is so the review appraiser can identify, early on, any areas that might present a problem in the later stages of review. It is important to maintain a good, open line of communication with the fee appraiser from the outset of the assignment. This helps to alleviate differences of opinion and identify problem areas before the actual review of reports begins.

DUAL REPORTS:

There are no dollar threshold amounts which automatically trigger dual reports on a parcel. At times, dual reports tend to confuse and cloud appraisal issues. There are instances when the acquisition is classed as “minor”, yet high unit values could push the compensation over a

predetermined thresholds for which two reports are required. The review appraiser always has the prerogative of requesting dual reports on any parcel based solely upon the complexity of the appraisal problem.

RETURN OF UNACCEPTABLE REPORTS:

If it become necessary to return appraisals to the appraiser for correction or additional data (see Review Procedure 8) the steps below will be followed:

1. All appraisals returned for correction must be accompanied by a transmittal letter (See Exhibits) pointing out the items in question.
2. Make a copy of the complete appraisal before returning it to the appraiser. Mark this copy "Returned for Correction" followed by the date it was returned.
3. Return the original and all copies that were submitted by the appraiser.
4. Send a copy of the transmittal letter to the Right of way Supervisor or project manager, and the second level review appraiser.
5. Place the copy of the original submission, and the corrected appraisal, when it is received, in the District parcel file to be retained as a permanent record copy of the appraisal.

The letter accompanying the reports to the appraiser should state the reasons for the return and what is needed to make them acceptable. It must also contain a date when the reports are to be resubmitted. No extensions beyond this date can be granted except on the authority of the Right of Way Supervisor.

It is strongly suggested that, before returning reports for correction, the review appraiser meet with the appraiser to discuss the deficiencies and the reasons for returning the reports. This personal contact should help to maintain a good working relationship with the appraiser.

UPDATING REPORTS IN REVIEW:

State law requires that a property owner be paid "Just Compensation" for his property when it is acquired for public use. Since just compensation is based on fair market value, it is essential that the review appraiser's determination of value reflect the current market value as of the date of review. To further assist the Reviewer, all appraisals made by staff, or fee, must bear a valuation date of not more than 15 days prior to the date of submission.

To insure that current market value is used in all negotiations, the following procedure will be used by review appraisers:

Upon notification by the relocation agent that housing is available, the reviewer appraiser will complete his review of that parcel, including any necessary updating.

1. Appraisals previously reviewed but on which the fair market value offer has not been made within a 180 day period will be re-reviewed to determine if there is a need for updating.
2. An appraisal update may be made by a review appraiser when there has been no substantial change in the physical characteristics of the parcel since the date of the appraisal, or the date of the last review.

3. The following method will be used for updating:

   (a). The reviewer must inspect, or re-inspect, the property to determine that there has been no substantial change in the property.

   (b). The reviewer must support his time adjustments by reference to current time studies submitted on other projects, or must prepare his own time study for documentation.

   (c). The reviewer must attach a new review sheet (Form RW 87) to the appraisal, setting forth his reasons and procedure for updating.

   (d). The reviewer must attach a new Sheet 16 (Form RW 20) showing the revised allocation resulting from the update.

4. Appraisals that have become outdated due to a substantial change in physical characteristics, or changes that involve valuation factors requiring the appraiser's judgment, will be returned to the appraiser for revision and updating.

SALVAGE VALUES:

It is the responsibility of the review appraiser to see that salvage values for improvements acquired are contained in the report or the review. Salvage values are generally obtained from the District's Property Management Section.

Salvage values do not necessarily apply only to buildings and/or building equipment which is considered real estate. Site improvements may also have some value as salvageable items. Examples might be chain link fences, light standards, underground storage tanks, gates and ornamental fencing. In determining the salvage value of signs, the necessary information should already be contained in the sign valuation estimate. For signs of any type, the salvage value is always the estimated value in place less the cost of relocation including the new base and wiring. If the relocation cost exceeds the value in place, the salvage value is zero. The appraiser or sign value estimator is required to provide this information.

IDENTIFICATION OF REMAINDER AS BUILDABLE LOT:

In situations when principal improvements have been acquired, relocation procedures may require a declaration as to whether the remainder is a buildable lot. A brief statement to this effect should be made in the reviewer’s remarks.

AIRSPACE LEASE REVIEW:

Airspace agreements (ground leases) are initiated and completed by Division of Traffic. Typically, an airspace agreement involves a lease between a property owner (lessee) and the Commonwealth of Kentucky (lessor). The review follows the same procedures as outlined previously with particular attention paid to analysis of economic rentals and rates of return. As always, the review appraiser must be satisfied that the report accurately portrays the property and that all major value factors have been considered. The recommended value will, in most cases, be a rental return on the property which is the subject of the airspace agreement.

These reports are reviewed at two levels. Summaries (original) submitted with these reports

should carry (**AIRSPACE AGREEMENT)** in parenthesis after the identifier or parcel number. Copies of the report and summary are retained in the Division of Right of Way and Utilities Central Office files. (See also: AIRSPACE AGREEMENTS)

ACCESS POINT APPRAISAL REVIEW:

Appraisals to estimate the difference in value caused by granting access on a controlled or partially controlled access highway are initiated and completed in Division of Traffic. The review of these reports follows the procedures previously outlined, keeping in mind the nature and purpose of the report and the value being found. Basically, these will be before value (as the property presently exists) and after value (as the property exists with access granted) appraisals. The difference in value, if any, will be the change brought about by the granting of the access point.

These reports are reviewed at two levels. Summaries (original) submitted with these reports should carry (**ACCESS POINT**) in parenthesis after the parcel number. Copies of the report and summary are retained in Division of Right of Way and Utilities Central Office files.

SURPLUS/EXCESS PROPERTY REVIEW:

These reports are reviewed at two levels. Summaries (original) submitted with these reports should carry (**SURPLUS**) or (**EXCESS**) in parenthesis after the parcel number. Copies of the report and summary are retained in Division of Right of Way and Utilities Central Office files.

Review of these appraisals should follow the same procedures as outlined for acquisition appraisals keeping in mind the nature and purpose of these reports. For instance, if an adjoining property owner has made application to purchase a parcel of surplus property, the report should contain two values; a separate entity value and a contributing value of the surplus to the adjoining property. The recommended value will be the higher of the two. The review appraiser should contact the Division of Right of Way and Utilities to ascertain the adequacy of types of value in the report.

One important aspect of these reports is that the date of valuation may be a date prior to the date of inspection. The reason for this is that the applicant may have obtained a prior permit to do work (filling, leveling, etc.) on the parcel and may have already completed the work. In most of these cases, the date of valuation will be before that work was completed. The review appraiser must assure, especially if any work has been completed on the parcel, that the effective date of appraisal is correct.

SUMMARY PREPARATION AND SUBMISSION:

Summaries are filed separately from the appraisal reports in Central Office and provide a quick reference of which reports have been approved and at what dollar amounts. They also serve as final approval from the Division Director or his designated representative for the compensation recommended. Every group of appraisals submitted to Central Office must be covered by an original summary itemizing each report in that submission.

The following list shows the number of copies of appraisal reports required on the various types of projects:

Report Type	Required from Appraiser	Submit to Central Office
Right of Way Acquisition	Original	Original
Transportation Enhancement	Original and Three	All
Excess & Surplus	Original and Four	All
Airspace Agreements	Original and Three	All
Access Points	Original and Three	All
Court Testimony	Original and One	All

Summaries take one of two forms:

1. **Three Signature Summary:** This summary is signed by the Right of Way Supervisor, or project manager, review appraiser and Appraisal Manager. It does not require the signature of a second level review appraiser, even though second level review appraisers periodically spot check reports submitted under these summaries and may, at their discretion, request all appraisals be submitted to them for review, including those that are submitted under this summary format. This summary authorizes the opening of negotiations upon approval by the Appraisal Manager and does not require recommendation by a second level review appraiser. Submissions under this summary are limited to the following amounts of compensation:

   A. Total acquisitions on which compensation does not exceed $50,000.

   B. Partial acquisitions on which compensation does not exceed $25,000.

2. **Four Signature Summary:** All appraisals exceeding those limitations noted above are submitted under a four signature summary which requires a second level review and recommendation prior to the Appraisal Manager's final approval.

Parcel allocation on individual summaries should be limited as follows:

1. No more than five (5) parcels carried on one summary regardless of dollar amounts of compensation.
2. A separate summary is prepared for each parcel on which two appraisals have been made regardless of dollar amounts of compensation.
3. Appraisals requiring two reviews are not to be submitted on the same summary with appraisals requiring only one review.

VERBAL APPROVALS, PHOTOCOPIES AND FAXED SUMMARIES:

Authority to buy parcels is not officially granted until the summary is signed by the Appraisal Manager. Verbal approvals are not to be given by second level review appraisers. Summaries are

not acceptable without original signatures. No action will be taken on photocopies, faxed, or pre-dated summaries.

REVISED REVIEWS AND SUMMARIES:

At times, it may become necessary to revise a review of an appraisal report which often may alter compensation. A revised review should be titled REVISED REVIEW in capital letters and underlined just below the review checklist on the Appraisal Review Sheet (RW 87). The total compensation (revised amount) should be shown as the recommended amount.

On the summaries accompanying revisions, the word (REVISED) in capitals and in parenthesis should follow the parcel number of the report which has been revised. Near the center of the summary sheet, immediately beneath that parcel, note should be made to the effect that this revision increases (or decreases) compensation by net plus (or minus) $ (dollars). The total revised amount is then entered under the AMOUNT column and the amount of increase (+) or decrease (-) for each parcel is displayed in the **"NET CHANGE"** column. Revised parcels and original submissions may be combined on the same summary.

With summaries containing revised parcels, the "Total This Summary" line should equal the net increase or decrease for those revised parcels plus the amount(s) approved for any additional parcels included on that summary. At times, a revision will result in no change in compensation even though something has changed in the property, the plans or the report. In those instances, it is still necessary to submit a revised review showing the same amount previously approved. This maintains the integrity of the appraisal since no one can then question that it was an appraisal oversight. Revisions which do not alter compensation do not require a summary.

Revisions that fall under the $25,000 limit for partial acquisitions, or $50,000 limit for total acquisitions, and which were caused by minor plan revisions, and which do not change the complexity of the appraisal problem, are not reviewed at the second level. Also, minor first level revisions in review caused by small area changes, etc., do not require a second level review.

SUMMARIES SUBMITTED WITH SUPPLEMENTAL ACQUISITIONS:

At times, it will be necessary to re-appraise a property from which additional right of way is needed after one acquisition has already taken place. In these cases, the report and review are submitted as though it were a new acquisition. On the summary, the letter **(F)** for "follow-up" in capitals and in parenthesis should follow the parcel number of the report which is being submitted. This is, in effect, compensation for a new parcel and not revised compensation for a parcel which has not been acquired. Likewise, it should be entered in the project totals at the bottom of the summary as if it were a new parcel.

REVIEWS AND SUMMARIES FOR UNECONOMIC REMNANTS:

When the remainder of a parcel is determined to be an uneconomic remnant, it is essential that fact be passed on to the buyer and others who read the report. In the review, the review appraiser should note that the parcel has a remainder which is an uneconomic remnant and set out (in the review) the total amount of compensation should the remnant be purchased along with the acquisition. Caution should be exercised here if the remnant has easements on it that would be eliminated by the acquisition of additional land areas.

On the summary, near the center of the sheet, immediately beneath that parcel, note is made to the effect that the parcel contains an uneconomic remnant that, if purchased, would increase total compensation to $ (dollars). The recommended amount of compensation (not including the remnant's value) is entered under the AMOUNT column. Project totals reflect only the amount of recommended compensation, not including the uneconomic remnant's value.

APPENDIX 5: LAND APPRAISAL REVIEW CHECKLIST

APPENDIX 6: REFERENCES

Babcock, Henry A. *Appraisal Principles and Procedures.* Washington, D.C.: American Society of Appraisers, 1980

Bernstein, Leopold A. *Financial Statement Analysis: Theory, Application and Interpretation.* 4th ed. Homewood, III.: Richard D. Irwin, 1989.

Brock, Thomas. "More on Capitalization Rates." *ASA Valuation* (June 1986), pp.68-71. Also in *Business Valuation News* (December 1985), pp. 5-8.

Bloombury Publishing Plc. Financial Articles in Internet

Copeland, Tom, Tim Koller, and Jack Murrin. 1994. *Valuation* (New York, NY: John Wiley & Sons, T,,

Cornell, Bradford. 1993. *Corporate Valuation: Tools For Effective Appraisal and Decision Making* (New York, NY: Business One Irwin).

Cornell, Bradford and Kevin Green. 1991. "The Investment Performance of Low-Grade Bond Funds." *Journal of Finance, vol.* 46, no. 1: 29-48.

Craig, Darryl; Glenn Johnson; and Maurice Joy. "Accounting Methods and P/E Ratios." *Financial Analysts Journal* (March-April 1987), pp. 41-45.

Damodaran, Aswath. 1994. *Damodaran on Valuation* (New York, NY: John Wiley & Sons, Inc.). Ehrhardt, Michael C. 1994. *The Search For Value* (Boston, MA: Harvard Business School Press).

Desmond, Glenn M., and John Marcello. *Handbook of Small Business Valuation Formulas.* Los Angeles, Calif.: Valuation Press, 1987.

Gilson, Stuart. *1997.* "Transactions Costs and Capital Structure Choice." *Journal of Finance, vol.* 52, no. 1: 161-196.

Gilson, Stuart, Edith Hotchkiss, and Richard Ruback. 2000. "Valuation *of* Bankrupt Firms." *Review of Financial Studies, vol.* 13, no.1: 43-74.

Grinblatt, Mark and Sheridan Titman. 1998. *Financial Markets and Corporate Strategy* (New York, NY: Irwin/McGraw-Hill).

Grimes, John Alden, and William Horace Craigue. *Principles of Valuation.* New York: Prentice-Hall, 1928.

Goff, Garry A. "Fair Market Value: A Primer for Texas Legal Practice." *Texas Tech Law Review* 15 (May 1984), pp. 637-71.

Hampton, John J. *Financial Decision Making: Concepts, Problems, and Cases.* 3rd ed. Reston, Va.: Reston Publishing, 1983.

Kaplan, Steven and Richard Ruback. 1995. "The Valuation of Cash Flow Forecasts: An Empirical Analysis." Journal of Finance, vol. 50, no. 4: 1059-1093.

King, Alfred M. "Fair Value Reporting." *Management Accounting* (March 1985), pp. 25- 30.

Largay, James A., III, and Clyde P. Stickney. "Cash Flows, Ratio Analysis and the W.T. Grant Company Bankruptcy." *Financial Analysts Journal* (July-August 1980), pp. 51-54.

Leung, T.S. Tony. "Myths about Capitalization Rate and Risk Premium." *Business Valuation News* (March 1986), pp. 6-10.

Levine, Sumner N., ed. *The Financial Analyst's Handbook.* 2nd ed. Homewood, III.:Dow Jones-Irwin, 1984

Mayfield, Scott. 1999. "Estimating the Market Risk Pre and Business School working paper.

Merton, Robert C. 1980. "On Estimating the Expected Return on the Market: An Exploratory Investigation." *Journal of Financial Economics, yol.* 8,, no. 4: 323-361.

McCarthy, George D., and Robert E. Healy. *Valuing a Company: Practices and Procedures.* New York: John Wiley & Sons, 1971.

Miles, Raymond C. *Basic Business Appraisal.* New York: John Wiley & Sons, 1984.

Nevers, Thomas J. "Capitalization Rates." *Business Valuation News* (June 1985), pp. 3-6

Patterson, Cleveland S. 1995. *The Cost of Capital: Theory and Estimation* (Westport, CT: Quorum Books). Pratt, Shannon P. 1998. *Cost of Capital* (New York, NY: John Wiley & Sons, Inc.).

Pratt, Shannon P. "A Note on Developing a Capitalization Rate Using the Capital Asset Pricing Model." *Business Valuation News* (March 1985), p.24.

"Rates of Return as an Influence on Value." New York University Proceedings of the Third Annual Institute on State and Local Taxation and Conference on Property Taxation (1985), pp.21.1-21.15.

"Understanding Capitalization Rates." *ASA Valuation* (June 1986), pp. 12-29.

Readings in Business Valuation. Washington, D.C.: American Society of Appraisers Educational Foundation, 1986.

Valuing a Business – The Analysis and Appraisal of Closely Held Companies. Homewood, 1989.

Ruback, Richard. 2000. "Capital Cash Flows: A Simple Approach to Valuing Risky Cash Flows." Harvard Business School working paper.

Schilt, James H. "Selection of Capitalization Rates for Valuing a Closely Held Business." *Business Law News* (Spring 1982), pp. 35-37.

Schnepper, Jeff A. *The Professional Handbook of Business Valuation.* Reading, Mass.: Addison-Wesley Publishing, 1982

Siegel, Joel G. *How to Analyze Businesses, Financial Statements, and the Quality of Earnings.* Englewood Cliffs, N.J.: Prentice-Hall, 1982.

Speedy, Squire L. *Financial Appraisal.* Wellington, New Zealand: New Zealand Institute of Valuers, 1982.

Welch, Ivo. 2000. "Views of Financial Economists on the Equity Premium and Other Issues." *Journal of Business, vol.* 74, no. 3: 501-537.

APPENDIX 7: TRAINING MODULES/AGENDAS

TRAINING NUMBER 1 (MODULE ONE)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with basic finance and accounting. At a minimum they will gain the ability to read, understand and create financial statements, think critically about cost accounting, business valuation, and corporate financial issues, and understand appraisals. The training will include presentations and interactive exercises

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 Types of financial statements - VD

10:15 – 11.15 Creation of Financial Statements + Exercises

11.15 – 11.30 Break

11.30 – 12.30 Creation of Financial Statements + Exercises (Continue)

12.30 – 13.45 Lunch

13.45 – 14:45 Interpreting of Financial Statements (Balance Sheet. Income Statement, Cash-flow Statement)

14:45 – 15.00 Break

15.00 – 16.00 Working Capital Analysis

TRAINING NUMBER 2 (MODULE TWO)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with advanced finance and accounting. At a minimum they will gain the ability to analyze financial statements, think critically about financial results, business valuation, and corporate financial issues, and understand appraisals. The training will include presentations and interactive exercises

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 Cash-flow analysis - VD

10:15 – 11.15 Cash-flow analysis + Exercises

11.15 – 11.30 Break

11.30 – 12.30 Ratio Analysis

12.30 – 13.45 Lunch

13.45 – 14:45 Ratio Analysis +Exercises

14:45 – 15.00 Break

15.00 – 16.00 Ratio Analysis +Exercises (Continue)

TRAINING NUMBER 3 (MODULE THREE)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with basics of advanced finance and business valuation. At a minimum they will gain the ability to read and understand the concept of value of money in time, think critically about financial results, business valuation, and corporate financial issues, and understand valuation assignment and approaches. The training will include presentations and interactive exercises

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 Introduction to business valuation – Valuation approaches

10:15 – 11.15 Concepts of Present Value, Future Value, Discounted Cash-flow, Net Present Value

11.15 – 11.30 Break

11.30 – 12.30 Exercises

12.30 – 13.45 Lunch

13.45 – 14:45 Concepts for Rate of Return, Internal Rate of Return, Capitalization Rate

14:45 – 15.00 Break

15.00 – 16.00 Valuation assignment

TRAINING NUMBER 4 (MODULE FOUR)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with income approach of business valuation. At a minimum they will gain the ability to determine appropriate discount rates, growth rates, understand the application of the discounted cash-flows in business valuation, and think critically about financial projections, critical assumptions and terminal value issues. The training will include presentations and interactive exercises

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 Introduction to Income Valuation approaches

10:15 – 11.15 Determining of Discount Rate, Capitalization Rate and Growth Rate

11.15 – 11.30 Break

11.30 – 12.30 Weighted average cost of (WACC) model: Exercises

12.30 – 13.45 Lunch

13.45 – 14:45 Projections of net result, critical assumptions (financial, business, industry) and application of the discounted cash-flow method for the determining of the Net present Value of the company.

14:45 – 15.00 Break

15.00 – 16.00 Determining of the Terminal Value and application of the debt-free discounted cash-flow method.

TRAINING NUMBER 5 (MODULE FIVE)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with comparative approach of business valuation. At a minimum they will gain the ability to understand the different market multiples, determine appropriate discount rates, growth rates, understand the application of the discounted cash-flows in business valuation, and think critically about financial projections, critical assumptions and terminal value issues. The training will include presentations and interactive exercises

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 Introduction to Discounted Cash Flow Valuation Method

10:15 – 11.15 Introduction to Discounted Cash Flow Valuation Method (continue)

11.15 – 11.30 Break

11.30 – 12.30 Discounted Cash Flow/Capitalization case study

12.30 – 13.45 Lunch

13.45 – 14:45 Discounted Cash Flow/Capitalization case study (continue).

14:45 – 15.00 Break

15.00 – 16.00 Determining of the case's Terminal Value and drafting of scenarios for price range.

TRAINING NUMBER 6 (MODULE SIX)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with basics of legal due diligence in business valuation. At a minimum they will gain the ability to read and understand legal papers, think critically about possible legal outcomes and appropriately design provisions for these, understand concepts of ownership, debt, secured debt and other legal. The training will include presentations and interactive exercises

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 Review of assets and ownership rights

10:15 – 11.15 Review of the legal issues where company is acting as a plaintiff/defendant and design of most appropriate provisions for the possible outcomes

11.15 – 11.30 Break

11.30 – 12.30 Review of the company's receivables and design of most appropriate provisions for the possible outcomes

12.30 – 13.45 Lunch

13.45 – 14:45 Review of company's debt and obligations issues

14:45 – 15.00 Break

15.00 – 16.00 Review of secured debt and issues related to it.

TRAINING NUMBER 7 (MODULE 7)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with the standards for writing of an appraiser's report. At a minimum they will gain the ability to apply the their skills build up under the previous training modules, learn the valuation administration procedures, forms and apply sequence approach to write an appraisers report. Additionally they will understand what are the main omissions, misconnects and usual problems that could be found in appraiser's report. The training session will drive all participants through a case study ending with the presentation of the appraiser's report.

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 How to write an appraiser's report

10:15 – 11.15 Case Study

11.15 – 11.30 Break

11.30 – 12.30 Case Study – (cont.) + writing of appraiser's report

12.30 – 13.45 Lunch

13.45 – 14:45 Writing of appraiser's report

14:45 – 15.00 Break

15.00 – 16.00 Presentation of appraiser's report, critical assessment.

TRAINING NUMBER 8 (MODULE 8)
BANKRUPTCY TRAINING FOR APPRAISERS

This training will familiarize appraisers with the standards for reviewing of an appraiser's report, and the writing of an audit review of an appraiser's report. At a minimum they will gain the ability to apply the their skills build up under the previous training modules, learn the valuation administration procedures, forms and apply sequence approach to write a review report. Additionally they will build up skills on how to identify the main omissions, misconnects and usual problems that could be found in appraiser's report. They will learn how to critically asses these issues and how to address them in the reviewer's report The training session will drive all participants through a case study ending with the presentation of the reviewer's report.

Agenda

9.00 – 9.15 Welcome and Overview of training – VD, KD

9.15 – 10.15 How to review and audit appraiser's report

10:15 – 11.15 How to write an audit review of an appraiser's report - Case Study

11.15 – 11.30 Break

11.30 – 12.30 Case Study – (cont.)

12.30 – 13.45 Lunch

13.45 – 14:45 Writing of an audit review of an appraiser's report.

14:45 – 15.00 Break

15.00 – 16.00 Presentation of reviewer's report