

Technology would seem the obvious solution to the corporate governance and compliance problem. Much of governance is a matter of putting rules in place and ensuring that they are followed. Corporate finance systems, historically among the first business systems to be computerized, have always worked in just such a fashion. Why not tweak them to take new rules into account?

Unfortunately, it is not quite that simple. The scale of new governance standards brings many corporate systems—not just the finance function—into the picture. Customer databases, human resources systems, document management and electronic collaboration tools all can contain data relevant to corporate governance. In addition, the changing nature of regulation means that systems have to be kept up-to-date. This requires constant planning and monitoring on the part of the IT director.

The main problem for companies is documentation, including internal controls and the retention of documents. For this reason, good document management systems—which trace the history of all documents and allow for their fast retrieval—are key to any company seeking to comply with corporate governance standards. Specialized secure electronic storage areas must be established to store documents, a task made slightly less onerous thanks to the falling price of storage hardware. In addition, corporate policies on the retention of documents must be clearly articulated, whereas in the past they may have been only implicit.

Even e-mail has fallen under scrutiny. New accounting standards dictate that audit trails must be established showing exactly how executives arrived at conclusions such as the valuation of assets. As such discussions are now just as likely to take place electronically as at physical meetings, any e-mails in which valuation was discussed would also be implicated. Currently, these vital communications are simply thrown onto a server along with every other e-mail and, after a period of time, deleted to make room for more. Rooting out and keeping these documents can be an IT management nightmare.

The most important issue is trying to make the accounts that companies present as meaningful and accurate as possible so that investors and auditors can have confidence in what is being presented. In achieving this, one of the greatest difficulties that companies face is grappling with the subtle distinctions between accounting and finance systems in different countries. Companies need to put in place systems that allow them to compare apples with apples across different territories. That can be very detailed but is necessary to achieve the transparency needed.

The sheer volume of data presents further problems. Companies should try to simplify their systems, bringing more of their databases within a single overarching structure and reducing the number of points at which data enters the system. At all costs, companies must avoid rigid IT systems that will become a headache to change every time the accounting regulations are tweaked or new regulations come into force. Flexibility is key, and anything hard-coded is a dead end.

Technology is just an enabler. Once a governance structure has been agreed to at a corporate level, IT can be used to support it. Governance must not be built

around a company's existing IT; the IT systems should be made to fit the business. Policies and procedures should be worked out first, in detail, to calculate the best ways of complying with all the regulations that pertain to a company. Only then should the IT department be brought in to figure out what updates need to be made to the existing systems, to decide whether new technology investments are needed, and to implement the changes and the procedures that have been deemed necessary.

To a large degree, successful corporate governance depends on people: this is a management issue. People require training around governance and must be taught the needed skills. For a company specializing in electronic invoicing, however, the real answer may not lie with people, nor with the strict implementation of dedicated compliance systems to enforce every detail of corporate governance regulation, but with eliminating manual intervention. Automation of existing processes can achieve this. Automated systems, such as enterprise resource planning applications, are more transparent than those requiring manual intervention, and less prone to fraud.

### **Six Technologies That Can Assist with Compliance**

Much of governance is a matter of putting rules in place and ensuring that they are followed. Technology can provide the solutions to the corporate governance and compliance problem. It includes computer software for the following six functions:

1. *Business intelligence.* Because regulatory requirements stipulate real-time disclosure of factors that affect financial performance, executives need access to timely, relevant data from all areas of the business. By drilling down into financial and company data and providing sophisticated reporting and analysis tools, business intelligence software can help ensure the accessibility of information.
2. *Business process management (BPM).* Businesses have traditionally been built around functional "silos," making it difficult to share information and obtain a consistent, enterprisewide view. By extracting businesses processes from the underlying application code into an independent management layer, BPM software can help improve visibility.
3. *Document management.* Because of new corporate governance standards, companies need an efficient system for storing and retrieving important records and documents. Software packages that maintain audit trails of documents and set controls over how, where, and for how long files are stored can help companies meet these obligations.
4. *E-mail management.* As the volume of e-mail continues to soar, the logistics of storing essential e-mails and being able to retrieve them quickly become increasingly complex. And with new regulatory requirements around internal controls and disclosure obligations, the need for comprehensive e-mail management software becomes more compelling.
5. *Financing and accounting.* To help comply with new standards, such as Sarbanes-Oxley, many vendors are giving their traditional financing and accounting software a boost with additional modules that help with risk manage-

**Infor Financial Management**

<http://www.infor.com>

Freestyle reporting capabilities; multinational, multi-currency processing of payments, invoices, and receivables; Web-enabled accounts receivable function.

**Sage 50**

<http://na.sage.com/sage-50-accounting-us/?isnow=sage50us>

Designed for small to medium-sized businesses; features multi-user capabilities.

**Sage DacEasy**

<http://na.sage.com/sage%20daceasy>

Designed to meet the needs of small- and medium-size businesses. DacEasy offers extensive functionality that lends itself to a wide range of industries. Its powerful reporting increases users' knowledge of their business. Its fully integrated modular design allows companies to choose cost-effective solutions for their accounting, payroll, order entry, and point-of-sale needs.

**Mid-Level Packages.** Purchasers of mid-level programs, although tough to define by revenue, usually include four or five accounting users and have needs that are technically sophisticated. These buyers generally require more robust, multi-user features and management reporting while still retaining tools that are required for a small business. Essential features of a package include client/server architectures, custom report design, and Internet/intranet-enabled functions. Some mid-level packages are as follows:

**AccountMate Software—AccountMate**

<http://www.accountmate.com>

Client/server software available to almost any size business.

**CheckMark Software—MultiLedger**

<http://www.checkmark.com>

Integrated, cross-platform accounting program combining general ledger, accounts receivable/payable, and inventory.

**PC Accountant—ProBooks**

<http://pcaccountant.com>

Features integrated, point-and-click accounting.

**Sage BusinessWorks Accounting**

<http://na.sage.com/sage%20businessworks>

Features 10 fully integrated modules; can support up to 48 concurrent users.

**Low-End Packages.** Products in this category are not short on capabilities or features. Rather, they are made for sole proprietorships, partnerships, and corporations that are closely held with only a few employees. Users of these products need a package that will help them balance checkbooks, prepare payroll reports and deposits, and keep track of bills and customer invoices; they want features such as single points of entry for data, on-the-fly updating, tight integration with the

Internet, sophisticated customized reporting, built-in job costing, and electronic payroll and bill paying services. Some low-end packages are as follows:

**Aatrix Software—P&L Accounting for Mac and Windows**

<http://www.aatrix.com>

Full suite of applications at low cost, including general ledger, payroll, and inventory management.

**SAGE**

<http://na.sage.com/sage-na/products-solutions/by-small-business>

Entry-level package for the small office/home office user.

**Intuit—QuickBooks**

<http://quickbooks.intuit.com>

Features include time tracking, job costing, and estimations; integrated with Microsoft Excel, Word, Outlook, and Symantec ACT!

**Account Edge for Mac and Windows**

<http://www.accountedge.com>

Features more than 100 accounting and financial management reports; supports multiple-currency accounting.

**Selecting Accounting Software.** When selecting accounting software, consider the following:

1. *Customization.* Can the package be customized? Can it be customized enough to meet user requirements? Can it customize items such as reports, forms, input screens, and source codes?
2. *Vendor reliability.* Is the vendor reliable? Does the vendor have sufficient resources? Is the vendor profitable and supported by sufficient, knowledgeable staff?
3. *Reporting.* Can the package produce required financial statements in a timely and accurate manner? Do the reports include the required ratios? Do the reports include graphical output? Do the reports incorporate third-party products FRx (offers reporting capabilities for the general ledger module) and Crystal Reports (extracts and reports event data from all modules)?
4. *Database.* Do the databases available with the package—Btrieve, Microsoft SQL Server, Oracle, and IBM DB2—match the user's needs? The user's number of transactions is a typical determinant of the database required.
5. *Client/Server.* Does the package come with a client/server version (i.e., a version that allows the user to save the bandwidth and time on the LAN and to distribute single processes across multiple computers throughout the organization)?
6. *Account number structure.* Does the account number structure accommodate the number of segments—subsidiaries, divisions, accounts, subac-

new security standard called Wi-Fi Protected Access (WPA), which implements 802.1X and the EAP to provide better security.

Many corporations use Virtual Private Networks (VPNs) to protect remote access to their WLANs. The VPNs also protect their connections. A VPN creates a secure virtual tunnel from the user's computer all the way to the corporation's server. This means that a secure connection is established from the user's Wi-Fi hardware, through his or her Wi-Fi access point, over the public Internet, through the corporation's access point, to the corporation's hardware. Existing systems can be modified to make use of VPN as to support a Wi-Fi network. There are many different types of VPNs, some of which are very expensive. Microsoft, however, provides a very basic VPN technology that is free. The VPN is provided with Microsoft's advanced server operating systems.

A VPN works through a company's server. It encrypts any data transferred to company computers from outside the office. VPN software also operates on remote computers and laptops. VPNs enable the transfer of data while protecting that data from being viewed by intruding parties. Setting up a VPN gives a company mobility, supporting communications from areas such as airports and hotels, thus enabling people to stay abreast of developing situations, which may be crucial to a client company. Through VPNs, individuals can access information in company networks from anywhere and companies can expand their networks to the homes of their employees. Therefore, through the use of a WLAN with a VPN, part-time employees can do more from the personal computers in their homes. In addition, full-time employees can spend more time with their families, due to the fact that they can perform a variety of tasks from their homes. Another important aspect of Wi-Fi security is its ability to provide different levels of access. For example, a company can provide top-notch security while allowing open access to the Internet and e-mail accounts for guests on the network. This is accomplished by granting network access at different levels. Therefore, a company's visitors can still have unlimited access to the Internet and e-mail while the VPN access is given only to authorized employees.

In addition to a VPN, wireless networks have a standard technology called Remote Access Dial-Up User Service (RADIUS). RADIUS is used to protect access to wireless networks. Remote Access Dial-Up User Service is security that allows only approved users to access the network. In order for someone to access the network and the corresponding files contained on the network, he or she must input a user name and password. The RADIUS server then verifies the name and password and, if correct, allows that person to access the network. A key feature to RADIUS is that it may be used to provide different levels of access. A company may use a RADIUS server to provide access to the Internet, another level of access for network databases, and yet another for e-mail. Microsoft provides a basic RADIUS server with its advanced server operating systems for free. Other RADIUS servers may be purchased in the forms of software and hardware, but can be rather pricey.

One of the most formidable lines of system defense is the firewall. Firewalls work by blocking unwanted and unauthorized people from viewing company databases. Many Wi-Fi access points have built-in firewalls. In addition, all Wi-Fis

include a network capability enabling a group of devices to share one Internet provider (IP) address, regardless of whether the IP is from a dial-up, cable, or DSL connection. This capability is called Network Address Translation (NAT). NAT works by creating new IP addresses for each computer of the group from the original single IP address. Therefore, the new IP addresses are invisible to users of the public Internet. The new IP addresses function separately "under the cover" of the original one.

**Public Wi-Fi.** Wireless networks are making their way into today's businesses and are steadily becoming a reality in many public areas. Companies such as Wayport, a company that provides Wi-Fi to hotels, airports, and other public areas around the country, are teaming up with major companies such as Sony, Sharp, and other members of the Wi-Fi Alliance to provide wireless fidelity. The Four Seasons, Holiday Inn, Hampton Inn, Ramada, and other major hotels are also teaming up to provide wireless fidelity, through Wayport, in their hotel chains. With members of industry groups such as the Bluetooth SIG and Wi-Fi Alliance pushing the development and advancement of a global wireless infrastructure, more hardware will be built on this standard. Cellular phones and laptops equipped with Bluetooth and Wi-Fi certification are already on the market. Eventually, wired connections will be a thing of the past. With hotels and airports around the world upgrading to wireless, companies that go wireless will be a step ahead. They will have the up-to-the-minute information needed, full integration of technological equipment, full access to their network databases, and the infrastructure to make it possible from anywhere in the world. An interested party's best bet is to begin researching the benefits and detriments of going wireless. The benefits of going wireless are:

- It is cost-effective because there are no costs to wire or for the labor to do so (it requires only setting up a software protocol).
- The network is portable—computers can be moved around the wireless router (a radio transmitter).
- It has peer-to-peer flexibility because of the absence of wires, so a traditional wired router is not needed.

The detriments of going wireless are:

- Transmission time is slower than the fastest wired networks.
- Radio frequency transmission is believed by some to cause health problems similar to those caused by microwaves (this is controversial).
- There may be security problems.

With the use of a *bridge*, a wireless network may be hooked up to a wired network. Therefore, a company's system may have an integration of wired and wireless networks. Beginning to upgrade now may be beneficial in the long run.

#### **WiMAX, 3G, 4G, and LTE Technologies**

Worldwide Interoperability for Microwave Access (WiMAX) is a wireless metropolitan area network based on the 802.16 family of standards. It covers a much wider area than a Wi-Fi wireless network, has a long-range radio with a reach of up to 50kms, and has the potential for speeds of up to 70 mbps.

make the asset more useful. Capital expenditures improve the quality or quantity of services to be derived from the asset.

*Depreciation* is the allocation of the historical cost of a fixed asset into expense over the period benefited to result in matching expense against revenue.

*Fractional year depreciation* is computing depreciation when the asset is acquired during the year. A proration is required.

**EXAMPLE 12:** On October 1, 2X11, a fixed asset costing \$10,000 with a salvage value of \$1,000 and a life of 5 years is acquired.

Depreciation expense for 2X12 using the sum-of-the-years' digits method is:

1/1/2X12 - 9/30/2X12	$5/15 \times \$9,000 \times 9/12$	\$2,250
10/1/2X12 - 12/31/2X12	$4/1 \times \$9,000 \times 3/12$	600
		\$2,850

Depreciation expense for 2X12 using double declining balance is:

Year	Computation	Depreciation	Book Value
0			\$10,000
10/1/20X4- 12/31/20X4	$3/12 \times \$10,000 \times 40\%$	\$1,000	9,000
1/1/20X5- 12/31/20X5	$\$9,000 \times 40\%$	3,600	5,400

Group and composite depreciation methods involve similar accounting. The group method is used for similar assets while the composite method is used for dissimilar assets. Both methods are generally accepted. There is one accumulated depreciation account for the entire group. The depreciation rate equals:

$$\frac{\text{Depreciation}}{\text{Gross cost}}$$

Depreciation expense for a period equals:

$$\text{Depreciation rate} \times \text{Gross Cost}$$

The depreciable life equals:

$$\frac{\text{Depreciation cost}}{\text{Depreciation}}$$

When an asset is sold in the group, the entry is:

Cash (proceeds received)  
 Accumulated depreciation (plug figure)  
 Fixed asset (cost)

**Note:** Upon sale of a fixed asset in the group, the difference between the proceeds received and the cost of the fixed asset is plugged to accumulated depreciation. No gain or loss is recognized upon the sale. A gain or loss would only be recognized if the entire assets were sold.

**EXAMPLE 13:** Calculations for composite depreciation follow:

Asset	Cost	Salvage	Depreciable	Cost	Life	Depreciation
A	\$25,000	\$5,000	\$20,000		10	\$2,000
B	40,000	2,000	38,000		5	7,600
C	52,000	4,000	48,000		6	8,000
	\$117,000	\$11,000	\$106,000			\$17,600

Composite rate:

$$\frac{\$17,600}{\$117,000} = 15.04\%$$

Composite life:

$$\frac{\$106,000}{\$17,600} = 6.02 \text{ years}$$

The entry to record depreciation is:

Depreciation 17,600  
 Accumulated depreciation 17,600

The entry to sell asset B for \$36,000 is:

Cash 36,000  
 Accumulated depreciation 4,000  
 Fixed asset 40,000

**Capitalized Interest.** Disclosure should be given of the interest capitalized and expensed. Interest incurred on borrowed funds is expensed.

However, interest on borrowed funds is capitalized to the asset account and then amortized in the following cases:

- Self-constructed assets for the company's own use. To justify interest capitalization, a time period must exist for assets to be prepared for use.
- Assets for sale or lease constructed as discrete, individual projects (e.g., real estate development).

**Investing Activities**

Investing activities involve cash flows generally applicable to changes in long-term asset items. Investing activities include purchasing debt and equity securities in other entities, buying and selling fixed assets, and making and collecting loans. Cash inflows from investing comprise (1) receipts from sales of equity or debt securities of other companies, (2) amounts received from disposing of fixed assets, and (3) collections or sales of loans made by the company principal portion. Cash outflows for investing activities include (1) disbursements to buy equity or debt securities of other companies, (2) payments to buy fixed assets, and (3) disbursements for loans made by the company.

**Note:** Activities related to acquisition or sale of a business or part thereof are investing items.

**Caution:** Gains or losses on sales of noncurrent assets are included as investing activities along with the assets to which they relate. These gains or losses are not included in net cash flow from operating items. Thus, they are an adjustment to net income in obtaining cash flow from operations.

**Financing Activities**

Financing activities include cash flows generally resulting from changes in long-term liabilities and stockholders' equity items. Included in financing activities are receiving equity funds, furnishing owners with a return on their investment, debt financing, and repayment or settlement of debt. Another element is obtaining and paying for other resources derived from creditors on noncurrent credit. Cash inflows from financing activities are composed of (1) funds received from the sale of stock and (2) funds obtained from the incurrence of debt. Cash outflows for financing activities include (1) paying off debt, (2) repurchase of stock, (3) dividend payments, and (4) other principal payments to long-term creditors.

**Note:** Stock dividends, stock splits, and appropriations of retained earnings are not included as financing activities because they do not use cash. They are intra-stockholder equity transactions.

**Caution:** Gains or losses from the early extinguishment of debt are part of the cash flow related to the repayment of the amount borrowed as a financing activity. Such gains or losses are not an element of net cash flow from operating activities.

**Operating Activities**

Operating activities relate to manufacturing and selling goods or the rendering of services. They do not apply to investing or financing functions.

Cash flow derived from operating activities typically applies to the cash effects of transactions entering into profit computations. Cash inflows from operating activities include (1) cash sales or collections on receivables arising from the initial sale of merchandise or rendering of service; (2) cash receipts from returns on loans, debt securities (e.g., interest income), or equity securities (e.g., dividend income) of other entities; (3) cash received from licensees and lessees; (4) receipt of a litigation settlement; and (5) reimbursement under an insurance policy. Cash outflows for operating activities include (1) cash paid for raw material or merchan-

dise for resale; (2) principal payments on accounts payable arising from the initial purchase of goods; (3) payments to suppliers of operating expense items (e.g., office supplies, advertising, insurance); (4) wages; (5) payments to governmental agencies (e.g., taxes, penalties); (6) interest expense; (7) lawsuit payment; (8) charitable contributions; and (9) cash refunds to customers for defective merchandise.

Additional breakdowns of operating cash receipts and disbursements may be made to enhance financial reporting. For example, a manufacturing company may divide cash paid to suppliers into payments applicable to inventory acquisition and payments for selling expenses.

ASC 410, *Asset Retirement and Environmental Obligations* (ASC 410-20), provides that a cash payment to pay off an asset retirement obligation should be presented under operating activities.

**Other Considerations**

There should be a separate presentation within the statement of cash flows of cash inflows and cash outflows from investing and financing activities. For example, the purchase of fixed assets is an application of cash, whereas the sale of a fixed asset is a source of cash. Both are shown separately to aid analysis by readers of the financial statements. Debt incurrence would be a source of cash, but debt payment would be an application of cash. Thus, cash received of \$800,000 from debt incurrence would be shown as a source, and the payment of debt of \$250,000 would be presented as an application. The net effect is \$550,000.

Separate disclosure shall be made of investing and financing activities impacting upon assets or liabilities that do not affect cash flow. Examples of noncash activities of an investing and financing nature are bond conversion, purchase of a fixed asset by the incurrence of a mortgage payable, capital lease, and nonmonetary exchange of assets. This disclosure may be footnoted or shown in a schedule. An illustrative presentation is as follows:

Net increase in cash	\$980,000
Noncash investing and financing activities:	
Purchase of land by the issuance of common stock	\$400,000
Conversion of bonds payable to common stock	200,000
	<u>\$600,000</u>

If a cash receipt or cash payment applies to more than one classification (investing, financing, operating), classification is made as to the activity that is the main source of that cash flow. For instance, the purchase and sale of equipment to be used by the company is typically construed as an investing activity.

In the case of foreign currency cash flows, the exchange rate at the time of the cash flow should be used in reporting the currency equivalent of foreign currency cash flows. The effect of changes in the exchange rate on cash balances held in

- A derivative designed to hedge vulnerability to changes in the fair value of a recognized asset or liability or firm commitment will have the gain or loss included in net income in the year of change coupled with the offsetting loss or gain on the hedged item associated with the hedged risk. The net impact of this accounting is to include in net income the degree to which the hedge is not effective in offsetting changes in fair value.
- A derivative hedging exposure to variable cash flows of a forecasted transaction (cash flow hedge) will have the effective part of the derivatives gain or loss initially presented as an element of other comprehensive income (outside of earnings) and later reclassified into earnings when the forecasted transaction impacts earnings. The ineffective part of the gain or loss is immediately presented in earnings. If a cash flow hedge is discontinued because it is probable that the initial forecasted transaction will not take place, the net gain or loss in accumulated other comprehensive income shall be immediately reclassified into earnings.
- A derivative whose purpose is to hedge foreign currency exposure of a net investment in a foreign activity will have the gain or loss presented under other comprehensive income as an element of the cumulative translation adjustment. The hedge of the foreign currency exposure may apply to an unrecognized firm commitment or an available-for-sale security.

**Note:** If a derivative is not to hedge an instrument, the gain or loss is included in net income in the period of change.

A company opting to use hedge accounting must disclose the method it will use to evaluate the success of the hedging derivative and the measurement means to ascertain the ineffective part of the hedge. The methods chosen must conform to the company's risk management policy.

Accounting for the change in fair value (gain or loss) of a derivative depends on whether or not it qualifies as part of a hedging arrangement and, if such is the case, the purpose of holding the derivative. Either all or a proportion of a derivative may be considered a hedging instrument. The proportion must be stated as a percentage of the whole derivative so that the risk in the hedging part of the derivative is the same as the entire derivative.

Two or more derivatives, or parts thereof, may be considered in combination and jointly designated as a hedging instrument.

If an impairment loss is recorded on an asset or liability associated with a hedged forecasted transaction, any offsetting net gain associated with that transaction in accumulated other comprehensive income should be reclassified immediately into net income of the period. In a similar manner, a recovery of the asset or liability resulting in a reduction of the net loss should be shown in earnings.

Required disclosures include identifying derivatives, time period for intended hedging, risk management policies of the company, where net gain or loss associated with derivatives are presented in the financial statements, and description of transactions or other events that will result in reclassification into earnings of gain and loss reported in accumulated other comprehensive income.

ASC 815, *Derivatives and Hedging* (ASC 815-15-30), permits a fair value measurement of any hybrid instrument containing an embedded derivative that otherwise would require bifurcation. The statement clarifies which principal-only and interest-only strips are not subject to the requirements of ASC 815, *Derivatives and Hedging*. ASC 815-15-30 provides that concentration of credit risk in the form of subordination is not embedded derivatives. It requires one to evaluate interests in securitized financial assets to identify interests that are freestanding derivatives or that are hybrid financial instruments having an embedded derivative requiring bifurcation.

Some types of derivative products are:

- *Interest rate swap*—an agreement between two entities to exchange interest payments on a specified principal amount over a given time period. Interest expense should be based on the adjusted interest rate. Any fees charged should be amortized over the life of the swap. Unrealized losses should be immediately reflected in the accounts on speculative swaps. On the other hand, unrealized gains are only footnoted.
- *Interest-only strip*—the right to receive the interest due on a bond, mortgage loan, or other interest-bearing financial asset.
- *Pay-in-kind (PIK) preferred stock*—the issuing company postpones paying cash dividends to holders and instead issues more preferred stock to them. The entry is to charge retained earnings and credit preferred stock.
- *Dual-currency bonds*—debt paying interest in one currency but paying the principal amount in another currency. The interest is usually paid in a currency having a low interest rate. Foreign exchange risk may be curtailed through hedging.
- *Bunny bond*—a bond in which interest is reinvested into comparable bonds. The issuing entity charges interest expense and credits debt payable for the reinvested funds.
- *Variable-coupon redeemable notes (VCRs)*—notes repriced periodically. The initial maturity date is one year but the interest rate changes weekly. Interest expense is charged at the actual interest rate for the period.
- *Floating-rate note (FRN)*—a note having a fluctuating interest rate based on some external measure such as the interest rate on Treasury bills.
- *Dutch auction notes*—notes for which the nominal interest rate is adjusted periodically (e.g., quarterly) based on new, low bids for the notes. Interest expense is recorded based on the interest rate set by the Dutch auction.
- *Increasing-rate debt*—an obligation maturing in the short term that may be extended periodically. Interest expense is based on the average interest rate for the anticipated time period of the debt. Issue costs are deferred and amortized into expense over the expected maturity period.
- *Zero-coupon bond*—a bond having no interest rate issued at a substantial discount. Interest is accrued each year irrespective of the fact that interest is not paid until the maturity date.

Distribution cost standards may be set jointly by the sales executives and the controller. Distribution cost standards may be either (1) generally applicable to overall distribution functions as a whole or by major division, or (2) in units that measure individual performance. Some illustrative standards that may be used for distribution costs are cost per sales order, cost per customer account, cost per call, cost per mile traveled, cost per day, cost per dollar of gross profit, selling expense as a percent of net sales, and selling expense per unit sold.

Distribution cost data may be analyzed in terms of number of new customers obtained, number of miles or days a salesperson travels, number of sales demonstrations, number of trucking miles, volume of goods handled in warehouse, and number of shipments handled.

Unlike manufacturing, for which there is typically only one standard cost for a product, many standard costs exist for distribution of the same item. For example, the cost per call may vary by territory. Further, even in one territory the standard cost to sell may vary, depending on the class of customers. Standards will vary because of different distribution channels, products, departments, territories, and customer classes. The conditions in each are not the same.

Distribution costs may be analyzed by size of order. Costs are segregated by factor of variability. Some costs will be recognized as fixed for all order sizes, and other costs may vary depending on volume (e.g., money volume, physical volume).

Although many distribution costs may be allocated based on sales, some distribution costs vary with factors other than sales volume itself, such as weight.

When distribution costs are to be prorated and determined based on products or territories, the predetermined distribution cost rate should be based on estimated sales by products or territories. The manager must establish standards for the activities of order getting and order filling.

When distribution costs are determined based on customers, costs should be allocated based on the amount of services received by each customer. This information will also help in determining which customers are entitled to price concessions and discounts.

The allocation of distribution expenses may be based on the credit terms associated with sales such as based on cash sales, credit sales, and installment sales.

Marketing costs may be evaluated based on distribution methods, such as direct selling to retailers and wholesalers as well as mail order sales.

### Allocation of Costs to Products

In allocating distribution costs to products, some guidelines that may be used are:

- Actual costs may be allocated based on actual activity.
- Budgeted costs may be allocated based on budgeted activity.
- Budgeted costs may be used because distribution costs for product lines are typically fixed and do not significantly change from actual costs. At the end of the year, the variance between budgeted and actual may be allocated to the product lines.

- Sales-effort costs (e.g., advertising samples) may be allocated on planned activity, and sales-service costs may be allocated based on actual activity. For example, when salespeople are required to report their time by product line, their salaries and related expenses should be allocated on this basis.

**Recommendation:** The preceding approaches will typically provide better product line costs than the generally used method of allocating total distribution costs on actual sales dollars or units.

Exhibit 19-5 presents different distribution costs and how they may be allocated to product lines.

In determining the amount of sales office expense assigned by dollar of sale groupings (e.g., sales less than 10,000 or sales between 10,000 and 20,000), the managerial accountant should consider the cost of taking an order, entering the order, billings, and accounting for the sale.

In evaluating a product line, consideration should be given to profitability, growth, competition, and capital employed. Accurate cost information aids in determining whether to drop unprofitable products or substantially raise prices.

### Exhibit 19-5: Distribution Costs and Allocation Bases to Products

Distribution Cost	Allocation Basis
Warehousing	Units or tonnage handled
Sales-service costs	Orders and invoices for each product
Direct selling costs (salespersons' salaries, commissions, and bonuses as well as sales or branch office expenses)	Sales value of product
Samples	Specific cost of each product sample
General corporate advertising	Sales value of products
Direct product advertising, newspaper, magazine, and direct mail	Directly to product being advertised
Shipping department sales and weight of product sales	Sales value of each product or relative
Delivery expenses	Size of product weighted by quantity sold

The purpose of allocating departmental overhead costs to products is similar to the purpose of allocating service department costs to production departments. A "fair share" of departmental overhead should be assigned to each product manufactured in the department.

An economic decision to allocate resources may have to be made, such as the allocation of capacity among products. This is especially important in the case of introducing a new product line.

When specific products have associated with them a greater portion of indirect costs, it may be preferable to allocate indirect costs to product lines. This approach

Project	Investment	Present Value
A	\$ 70,000	\$112,000
B	100,000	145,000
D	60,000	79,000
	<u>\$ 230,000</u>	<u>\$336,000</u>

where net present value = \$336,000 - \$230,000 = \$106,000

Unfortunately, the profitability index method has some limitations. One of the more serious limitations is that it breaks down whenever more than one resource is rationed.

A more general approach to solving capital rationing problems is the use of mathematical (or zero-one) programming. Here, the objective is to select the mix of projects that maximizes the net present value subject to a budget constraint.

**EXAMPLE 12:** Using the data given in Example 11, we can set up the problem as a mathematical programming one. First we label project A as  $X_1$ , B as  $X_2$ , and so on. The problem can be stated as follows:

Maximize

$$\text{NPV} = \$42,000 X_1 + \$45,000 X_2 + \$16,500 X_3 + \$19,000 X_4 - \$2,000 X_5 + \$15,000 X_6$$

subject to

$$\$70,000 X_1 + \$100,000 X_2 + \$110,000 X_3 + \$60,000 X_4 + \$40,000 X_5 + \$80,000 X_6 \leq \$250,000;$$

$$X_i = 0, 1 \quad (i = 1, 2, \dots, 6)$$

Using the mathematical program solution routine, the solution to this problem is:

$$X_1 = 1, X_2 = 1, X_4 = 1$$

and the net present value is \$106,000. Thus, projects A, B, and D should be accepted.

## CONTINGENT PROPOSALS

A contingent proposal is one that requires acceptance of another related one. Hence, the proposals must be looked at together. A profitability index for the group is computed.

**EXAMPLE 13:**

Proposal	Present Value of Cash Outflow	Present Value of Cash Inflow
A	\$160,000	\$210,000
B	60,000	40,000
Total	<u>\$220,000</u>	<u>\$250,000</u>

$$\text{Profitability index} = \frac{\$250,000}{\$220,000} = 1.14$$

## INTERNAL (TIME-ADJUSTED) RATE OF RETURN

The internal rate of return (IRR), also known as the time-adjusted rate of return, is the return earned on a given proposal. It is the discount rate equating the net present value of cash inflows to the net present value of cash outflows to zero. The internal rate of return assumes cash inflows are reinvested at the internal rate.

This method involves trial-and-error computations. However, the use of a computer or programmable calculator simplifies the internal rate of return process.

The internal rate of return can be compared with the required rate of return (cut-off or hurdle rate).

**Rule of Thumb:** If the internal rate of return equals or exceeds the required rate, the project is accepted. The required rate of return is typically a company's cost of capital, sometimes adjusted for risk.

The internal rate of return considers the time value of money, and is more realistic and accurate than the accounting rate of return method. It does not consider the varying size of investment in competing projects and their respective dollar profitabilities. Further, in limited cases, when there are multiple reversals in the cash flow stream, the project could yield more than one IRR.

To solve for internal rate of return where unequal cash inflows exist, the trial-and-error method can be used while working through the present value tables. Guidelines in using trial and error are:

- Compute net present value at the cost of capital, denoted here as  $r_1$ .
- See if net present value is positive or negative.
- If net present value is positive, use a higher rate than  $r_1$ .
- If net present value is negative, use a lower rate than  $r_1$ . The exact internal rate of return at which net present value equals zero is somewhere between the two rates.
- Compute net present value using  $r_1$  and the other rate chosen.
- Perform interpolation for exact rate.

**EXAMPLE 14:** A project costing \$100,000 is expected to produce the following cash inflows:

Overhead Cost Pool	Predetermined Overhead Rate	Level of Cost Driver	Assigned Overhead Cost
Machine setups	\$1,000 per setup	2 setups	\$2,000
Material handling	\$2 per pound	10,000 pounds	20,000
Waste control	\$5 per pound	2,000 pounds	10,000
Inspection	\$75 per inspection	10 inspections	750
Other overhead costs	\$10 per machine hour	500 machine hours	5,000
Total			\$37,750

The total overhead cost assigned to job Number 3941 is \$37,750, or \$18.88 per tool. Compare this with the overhead cost that is assigned to the job if the firm uses a single predetermined overhead rate based on machine hours:

Total budgeted overhead cost	\$525,000
=	
Total predicated machine hour	20,000
= \$26.25 per machine hour	

Under this approach, the total overhead cost assigned to job Number 3941 is \$13,125 (\$26.25 per machine hour × 500 machine hours). This is only \$6.56 per tool, which is about one third of the overhead cost per tool computed when multiple cost drivers are used.

The reason for this wide discrepancy is that these special-purpose tools require a relatively large number of machine setups, a sizable amount of waste materials, and several inspections. Thus, they are relatively costly in terms of driving overhead costs. Use of a single predetermined overhead rate obscures that fact.

Misestimating the overhead cost per drum to the extent illustrated in the foregoing can have serious adverse consequences for the firm. For example, it can lead to poor decisions about pricing, product mix, or contract bidding. The managerial accountant needs to weigh such considerations carefully in designing a product costing system. A costing system using multiple cost drivers is more costly to implement and use, but it may save millions through improved decisions.

Activity-based costing is a useful profit analysis tool that can reveal hidden profitability sources and embedded costs. It assists in cost-to-serve activities, customer profitability, channel income, capacity planning and drive predictive modeling, and is also a good source of performance measures.

### ACTIVITY-BASED MANAGEMENT

Activity-based management (ABM) is one of the most important ways to be competitive. It is a system-wide, integrated approach that focuses management's attention on activities with the goal of improving customer value, reducing costs, and improving the resulting profit. The basic premise of ABM is: *Products consume activities; activities consume resources.* To be competitive, both (1) the activities that

go into manufacturing the products or providing the services and (2) the cost of those activities must be known. To cut down a product's costs, the activities the product consumes will likely have to be changed. Ordering across-the-board cuts to reduce cost by 10%, for example, rarely obtains the desired results.

In order to achieve desired cost reductions, first identify the activities that a product or service consumes. Then figure out how to rework those activities to improve productivity and efficiency. Process value analysis is used to try to determine why activities are performed and how well they are performed. Activity-based costing, discussed in this chapter, is a tool used in activity-based management.

### Process Value Analysis

Process value analysis is the process of identifying, describing, and evaluating the activities a company performs. It produces the following four outcomes:

1. What activities are performed.
2. How many people perform the activities.
3. The time and resources required to perform the activities.
4. An assessment of the value of the activities to the company, including a recommendation to select and keep only those that add value.

### Understanding What Causes Costs

Effective cost control requires managers to understand how producing a product requires activities and how activities in turn generate costs. Consider the activities of a manufacturer facing a financial crisis. In a system of managing by the members, each department is told to reduce costs in an amount equal to its share of the budget cut. The usual response by department heads is to reduce the number of people and supplies, as these are the only cost items that they can control in the short run. Asking everyone to work harder produces only temporary gains, however, as the pace cannot be sustained in the long run.

Under ABM, the manufacturer reduces costs by studying what activities it conducts and develops plans to eliminate non-value-added activities and to improve the efficiency of value-added activities. Eliminating activities that do not create customer value is a very effective way to cut costs. For example, spending \$100 to train all employees to avoid common mistakes will repay itself many times over by reducing customer ill will caused by those mistakes.

### Value-Added and Non-Value-Added Activities

A *value-added activity* is an activity that increases the product's service to the customer. For instance, purchasing the raw materials to make a product is a value-added activity. Without the purchase of raw materials, the organization would be unable to make the product. Sanding and varnishing a wooden chair are value-added activities because customers do not want splinters. Value-added activities are evaluated by how they contribute to the final product's service, quality, and cost.

Good management involves finding and, if possible, eliminating non-value-added activities. *Non-value-added activities* are activities that, when eliminated reduce costs without reducing the product's potential to the customer. In many

	No Opinion	Strongly Disagree	Some- what Disagree	Some- what Agree	Strongly Agree
--	---------------	----------------------	---------------------------	------------------------	-------------------

- 33. Job control instruction sets are menu-driven. \_\_\_\_\_
- 34. Jobs are executed only from the operator's terminal. \_\_\_\_\_

**IV. Outside Computer Service Organizations**

This section should be used to document your understanding of how the company uses an outside computer service organization to process significant accounting information. Guidance on auditing entities that use computer service organizations is contained in SAS No. 70, *Reports on the Processing of Transactions by Service Organizations* (AU section 324).

1. List the name of the service organization and the general types of services it provides.

\_\_\_\_\_

\_\_\_\_\_

2. Are the general ledger and other primary accounting records processed by an outside service organization? \_\_\_\_\_ Yes \_\_\_\_\_ No

If yes, describe the source documents provided to the service organization, the reports and other documentation received from the organization, and the controls maintained by the user over input and output to prevent or detect material misstatement.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. List the type and date of the most recent service auditor report.

\_\_\_\_\_

\_\_\_\_\_

**Exhibit 28-3: Financial Reporting Information Systems and Controls Checklist—Medium to Large Business**

**Revenue Cycle**

*Revenue, Accounts Receivable, and Cash Receipts*

.01 This checklist may be used on any audit engagement of a medium to large company when the revenue cycle is significant. Normally, the revenue cycle is significant in most audit engagements.

.02 The purpose of this checklist is to document your understanding of controls for significant classes of transactions. Your knowledge of the revenue cycle should be sufficient for you to understand—

- How cash and credit sales are initiated
- How credit limits are established and maintained
- How cash receipts are recorded
- How sales and cash receipts are processed by the accounting system
- The accounting records and supporting documents involved in the processing and reporting of sales, accounts receivable, and cash receipts
- The processes used to prepare significant accounting estimates and disclosures

*Interpreting Results*

.03 This checklist documents your understanding of how internal control over the revenue cycle is designed and whether it has been placed in operation. It should help you in planning a primarily substantive approach. To assess control risk below the maximum, you will need to design tests of controls and then test specific controls to determine the effectiveness of their design and operation.

.04 The processes, documents, and controls listed on this questionnaire are typical for medium to large business entities but are by no means all-inclusive. The preponderance of "No" or "N/A" responses may indicate that the entity uses other processes, documents, or controls in their information and communication systems. You should consider supplementing this questionnaire with a memo or flowchart to document significant features of the client's system that are not covered by this questionnaire. (See AAM section 4500 for example flowcharting techniques.)

.05

	Personnel	N/A	No	Yes
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**1. Revenue and Accounts Receivable**

**A. Initiating Sales Transactions**

- 1. Credit limits are clearly defined. \_\_\_\_\_
- 2. Credit limits are clearly communicated. \_\_\_\_\_
- 3. The credit of prospective customers is investigated before it is extended to them. \_\_\_\_\_
- 4. Credit limits are periodically reviewed. \_\_\_\_\_

	2X14	2X15
Estimated revenue to total revenue	59%	65%
Estimated revenue to net income	104%	148%
Estimated expenses to total expenses	64%	66%
Estimated expenses to total revenue	28%	37%
Estimated expenses to net income	49%	85%

In every case, there was greater estimation involved in the income measurement process in 2X15 relative to 2X14. The higher degree of estimation resulted in uncertain earnings.

**Discontinued Operations**

Income from discontinued operations is usually of a one-time nature and should be ignored when forecasting future earnings. Further, a discontinued operation implies a company is in a state of decline or that a poor management decision is the cause for the firm’s entering the discontinued line of business in the first place.

**Profitability Measures**

A sign of good financial health and how effectively the firm is managed is its ability to generate a satisfactory profit and return on investment. Investors will refrain from investing in the business if it has poor earning potential because of the adverse effect on market price of stock and dividends. Creditors will be reluctant to get involved with a company having poor profitability because of collection risk. Absolute dollar profit by itself has minimal significance unless it is compared to its source.

A company’s profit margin (net income to sales) indicates how well it is being managed and provides clues to a company’s pricing, cost structure, and production efficiency. A high gross profit percent (gross profit to sales) is favorable since it indicates the company is able to control its manufacturing costs.

Return on investment points to the degree to which profit is achieved on the investment. Two key ratios of return on investment are (1) *return on total assets* and (2) *return on owners’ equity*.

The return on total assets (net income/average total assets) points to the efficiency with which management has employed its resources to obtain income. Further, a decline in the ratio may result from a productivity problem.

The return on common equity (earnings available to common stock/average stockholders’ equity) measures the rate of return on the common stockholders’ investment.

An increase in the gross profit margin (gross profit to sales) may mean the company was able to increase its sales volume or selling price, or to reduce its cost of sales. In general, manufacturers have higher gross profit rates than merchandisers.

The net operating profit ratio (net operating profit to sales) reveals what is left over for interest, nonrecurring charges, taxes and profit for the stockholders. It may be used as a basis to evaluate operating managers. The analysis is before considering interest expense since financing is typically arranged by the finance managers.

A high ratio of sales to working capital indicates efficient utilization of liquid funds. The sales backlog should be used to monitor sales status and planning. Compute the days of sales in backlog equal to:

$$\frac{\text{Backlog balance}}{\text{Sales volume divided by days in period}}$$

Is the backlog for long-range delivery (e.g., five years from now) or on a recurring basis to maintain continuing stability?

Some other ratios reflective of operations are:

- Revenue to number of employees as well as revenue to employee salaries. Higher ratios are reflective of better employee productivity.
- Average yearly wage per employee and average hourly wage rate. These ratios examine the ability to control labor costs.
- Average fixed assets per employee. This shows the productivity of using fixed assets by employees.
- Indirect labor to direct labor. A low ratio is reflective of controlling the labor component of overhead.
- Purchase discounts to purchases. A high ratio indicates effective management of purchases.
- General and administrative expenses to selling expense. This ratio indicates the degree of control and surveillance over G&A expense relative to sales activities. G&A expenses relative to selling expenses should decline with increased sales volume. If the ratio is increasing, inadequate controls over administrative activities may exist.

**Growth Rate**

A company’s growth rate should be compared to that of competitors and industry norms.

Measures of growth rate =

$$\frac{\text{Change in retained earnings}}{\text{Stockholders' equity at beginning of year}}$$

$$\frac{\text{EPS (end of year) - EPS (beginning of year)}}{\text{EPS (beginning of year)}}$$

The growth rate in sales, dividends, total assets, and the like may be computed in a similar fashion.

In reengineering, the focus should be on the current and potential customer and then on corporate structure and processes designed accordingly—in other words, reengineering from the outside in. Managers must monitor and track the current and emerging satisfaction needs of customers and formulate the products and services they demand. New product innovation and creativity may be required. Reengineering must create “real value” for the customer. In so doing, consider whether the current product/service line helps in keeping present customers and expanding the customer base.

Objectives for cost reduction should be established, such as time for each job (task, operation, or activity), expected maintenance, and compatibility.

Employees must understand the why of reengineering so their support, contribution, and continued morale may be obtained. Cultural differences have to be taken into account. Disproportionate downsizing is a mistake. The company must be restructured logically and practically. Proper planning is required to avoid any surprises.

Reengineering may aid in developing new products and/or services, improving product distribution, and achieving growth. A successful strategy can include joint ventures and franchising. The purposes of reengineering include:

- Cost control and reduction (e.g., employee costs).
- Revenue, profit, and rate of return maximization.
- Growth and capacity.
- Reduction in risk.
- Appreciation in stock and bond price.
- Improvement in bond rating.
- Lowering the cost of financing.
- Inventory reduction.
- Improved market share.
- Remaining competitive.
- Reduction in headcount.
- Change in corporate culture.
- Additional flexibility.
- Spinoff of a segment or operation.
- Improved quality.
- Improved integration.
- Streamlining production and distribution.
- Staying current with the latest technology.
- Improved productivity.
- Improved interaction and communication.
- Improved product delivery and service.
- Change in the product/service mix.

In reengineering, consideration should be given to the cost and time of doing so, new ideas, developing products and services, managing operations and projects, portfolio management, retraining, acquisitions and mergers, joint ventures, automation, amount of restructuring needed, change to equipment, employee training, inspection requirements, infrastructure, risk profile, whether fundamental or incremental change is needed, reassignment (if any) of displaced employees, and legal and contractual provisions and limitations.

The right resources must be at the right places at the right time. Processes may be redesigned to improve service quality and promote efficiencies. Continuous improvement in processes and procedures, job descriptions, and workflow mandate commitment and follow through. However, be careful not to make inappropriate or incorrect changes to the system or process. The effect of current changes on the future must be taken into account. A manager does not want to make a change that will have an immediate benefit but will have a long-term negative effect. An example is laying off experienced supervisors who will be needed to train employees when business picks up in the future. Questions to be answered in reengineering follow:

- Should the reengineering effort be centralized or decentralized? If decentralized, how will integration be accomplished?
- Where does reengineering begin and end?
- What expectations are there to be achieved?
- What is the role of technology in the reengineering effort?
- What are the logistics throughout the project's life?
- What effect do reengineering efforts have on the environmental program of the business?
- How much value does the reengineering plan achieve?
- What uncertainties and risks does reengineering have and what steps have been undertaken to reduce such risks? The risks associated with reengineering include financial, technological, operational, and political.
- What legal issues and contract commitments are raised because of the reengineering program?
- Will outside consultants be involved? If so, to what extent?
- When and how will periodic reviews (reports) take place?
- Is reengineering proceeding as scheduled? If not, what is the problem and how may it be rectified?
- Who will be assigned to the reengineering effort, and why? What are their qualifications and time commitment?

Before full-scale reengineering takes place at the entire company, a pilot program and prototyping should be conducted to identify problems, learn from mistakes, and formulate sound strategies and approaches based on experience. By developing solutions to expected problems before full-scale implementation, the company may save in cost and time as well as reduce risks. It is best to complete

Instead of a simple average, a weighted-average adjusted historical earnings figure is recommended. This gives more weight to the most recent years<sup>3</sup> which reflects higher current prices and recent business performance. If a five-year weighted average is used, the current year is given a weight of 5 while the first year is assigned a weight of 1. The multiplier is then applied to the weighted-average five-year adjusted earnings to get the value of the business.

**EXAMPLE 11:**

Year	Net Income	×	Weight	=	Total
2X17	\$120,000	×	5	=	\$600,000
2X16	100,000	×	4	=	400,000
2X15	110,000	×	3	=	330,000
2X14	90,000	×	2	=	180,000
2X13	115,000	×	1	=	115,000
			15		\$1,625,000

Weighted-average five-year earning:

$$\$1,625,000 / 15 = \$108,333$$

Weighted-average 5-year earnings:	\$108,333
× Capitalization factor	× 4*
Capitalization-of-earnings valuation	\$433,332

\* The capitalization factor should be based on such factors as risk, stability of earnings, expected future earnings, liquidity, etc.

If the company's financial statements are not audited, you should insist on an audit to assure accurate reporting.

Has the owner of a closely held company failed to record cash sales to hide income? One way of determining this is to take purchases and add a typical profit markup in the industry. To verify reported profit, you can multiply the sales by the profit margin in the industry. If reported earnings are significantly below what the earnings should be based on the industry standard, there may be some hidden income.

**Capitalization of Excess Earnings**

The best method is to capitalize excess earnings. The normal rate of return on the weighted-average net tangible assets is subtracted from the weighted-average adjusted earnings to determine excess earnings. It is suggested that the weighting be based on a five-year period. The excess earnings are then capitalized to determine the value of the intangibles (primarily goodwill). The addition of the value of the intangibles and the fair market value of the net tangible assets equals the total valuation. As per IRS Revenue Ruling 68-609 [1968-2 C.B. 327], the IRS

<sup>3</sup> American Institute of CPAs, Valuation of a Closely-Held Business, Small Business Consulting Practice Aid

No. 8, Management Advisory Services Practice Aids, New York, 1987, p. 13.

recommends this method to value a business for tax purposes. The Revenue Ruling states that the return on average net tangible assets should be the percentage prevailing in the industry. If an industry percentage is not available, an 8% to 10% rate may be used. An 8% return rate is used for a business with a small risk factor and stable earnings while a 10% rate of return is used for a business having a high risk factor and unstable earnings. The capitalization rate for excess earnings should be 15% (multiple of 6.67) for a business with a small risk factor and stable earnings and a 20% capitalization rate (multiple of 5) should be used for a business having a high risk factor and unstable earnings. Thus, the suggested return rate range is between 8% to 10%. The range for the capitalization rate may be between 15% to 20%.

**EXAMPLE 12:** Weighted-average net tangible assets are computed

below:

Year	Amount	×	Weight	=	Total
2X13	\$ 950,000	×	1	=	\$ 950,000
2X14	1,000,000	×	2	=	2,000,000
2X15	1,200,000	×	3	=	3,600,000
2X16	1,400,000	×	4	=	5,600,000
2X17	1,500,000	×	5	=	7,500,000
			15		\$19,650,000

Weighted-average net tangible assets:

$$\$19,650,000 / 15 = \$1,310,000$$

Weighted-average adjusted net income (5 years)—assumed	\$600,000
Tangible net assets (\$1,310,000 × 10%)	131,000
Excess earnings	\$469,000
Capitalization rate (20%)	× 5
Value of intangibles	\$2,345,000
Fair market value of net tangible assets	3,000,000
Capitalization-of-excess-earnings valuation	\$5,345,000

**Capitalization of Cash Flow**

The adjusted cash earnings may be capitalized in arriving at a value for the firm. This method may be suitable for a service business.

**EXAMPLE 13:**

Adjusted cash earnings	\$100,000
× Capitalization factor (25%)	× 4
Capitalization of cash flow	\$400,000
Less liabilities assumed	50,000
Capitalization-of-cash-flow earnings	\$350,000

tion concerning the expectations of a firm's future total market return. This is of interest to security analysts and investors.

### THE PERCENT-OF-SALES METHOD FOR FINANCIAL FORECASTING

Percentage of sales is the most widely used method for projecting the company's financing needs. This method involves estimating the various expenses, assets, and liabilities for a future period as a percent of the sales forecast and then using these percentages, together with the projected sales, to construct pro forma balance sheets.

Basically, forecasts of future sales and their related expenses provide the firm with the information needed to project its future needs for financing. The basic steps in projecting financing needs are:

1. Project the firm's sales. The sales forecast is the initial most important step. Most other forecasts (budgets) follow the sales forecast.
2. Project additional variables such as expenses.
3. Estimate the level of investment in current and fixed assets required to support the projected sales.
4. Calculate the firm's financing needs.

The following example illustrates how to develop a pro forma balance sheet and determine the amount of external financing needed.

**EXAMPLE 1:** Assume that sales for 2X14 = \$20, projected sales for 2X15 = \$24, net income = 5% of sales, and the dividend payout ratio = 40%. Exhibit 43-1 illustrates the step-by-step method. All dollar amounts are in millions.

**Exhibit 43-1: Pro Forma Balance Sheet (in millions of dollars)**

	Present (2X14)	% of Sales (2X14 Sales = \$20)	Projected (2X15 Sales = \$24)
<b>ASSETS</b>			
Current assets	2	10	2.4
Fixed assets	4	20	4.8
Total assets	<u>6</u>		<u>7.2</u>
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>			
Current liabilities	2	10	2.4
Long-term debt	2.5	n.a.	2.5
Total liabilities	<u>4.5</u>		<u>4.9</u>
Common stock	0.1	n.a.	0.1

	Present (2X14)	% of Sales (2X14 Sales = \$20)	Projected (2X15 Sales = \$24)	
Paid-in-Capital	0.2	n.a.	0.2	
Retained earnings	<u>1.2</u>		<u>1.92<sup>(a)</sup></u>	
Total equity	<u>1.5</u>		<u>2.22</u>	
Total liabilities and stockholders' equity	6		<u>7.12</u>	Total financing needed
			<u>0.08<sup>(b)</sup></u>	External financing needed
			<u>7.2</u>	Total

$$\begin{aligned}
 \text{(a) 2X15 retained earnings} &= \text{2X14 retained earnings} + \text{projected net income} - \text{cash dividends paid} \\
 &= \$1.2 + 5\%(\$24) - 40\%[5\%(\$24)] \\
 &= \$1.2 + \$1.2 - 0\$0.48 \\
 &= \$2.4 - \$0.48 \\
 &= \$1.92
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) External financing needed} &= \text{projected total assets} - (\text{projected total liabilities} + \text{projected equity}) \\
 &= \$7.2 - (\$4.9 + \$2.22) \\
 &= \$7.2 - \$7.12 \\
 &= \$0.08
 \end{aligned}$$

The steps for the computations are outlined as follows:

**Step 1.** Express those balance sheet items that vary directly with sales as a percentage of sales. Any item such as long-term debt that does not vary directly with sales is designated "n.a.," or "not applicable."

**Step 2.** Multiply these percentages by the 2X15 projected sales = \$24 to obtain the projected amounts as shown in the last column.

**Step 3.** Simply insert figures for long-term debt, common stock and paid-in-capital from the 2X14 balance sheet.

**Step 4.** Compute 2X15 retained earnings as shown in (b).

**Step 5.** Sum the asset accounts, obtaining total projected assets of \$7.2, and also add the projected liabilities and equity to obtain \$7.12, the total financing provided. Since liabilities and equity must total \$7.2, but only \$7.12 is projected, we have a shortfall of \$0.08 "external financing needed."

Reduction in average accounts receivable balance	\$1,116,667
Rate of return	× .15
Return	\$175,000

**Disadvantage**

Cost of the discount $0.30 \times 0.25 \times \$14,000,000$	\$105,000
Net advantage of discount	\$70,000

**CREDIT POLICY**

Should the company give credit to marginal customers? We have to compare the earnings on sales obtained to the added cost of the receivables.

**Note:** If the company has idle capacity, the additional earnings equal the contribution margin on the incremental sales because fixed costs are constant. The additional cost on the additional receivables results from the greater number of bad debts and the opportunity cost of tying up funds in receivables for a longer time period.

**EXAMPLE 5:**

Sales price per unit	\$120
Variable cost per unit	30
Fixed cost per unit	15
Annual credit sales	\$600,000
Collection period	1 month
Minimum return	16%

If you liberalize the credit policy, you project that

- Sales will increase by 40%.
- The collection period on total accounts will be two months.
- Bad debts on the increased sales will be 5%.

Preliminary calculations:

Current units ( $\$600,000/\$120$ )	5000
Additional units ( $5,000 \times 0.4$ )	2000

The new average unit cost is now calculated:

	Units	×	Unit cost	=	Total cost
Current units	5,000	×	\$95		\$475,000
Additional units	2,000	×	\$80		160,000
Total	7,000				\$635,000

$$\text{New average unit cost} = \frac{\text{Total cost}}{\text{Units}} = \frac{\$635,000}{7,000} = \underline{\$90.71}$$

Note that at idle capacity, fixed cost remains constant. Thus, the incremental cost is only the variable cost of \$80 per unit. This will cause the new average unit cost to drop.

**Advantage**

Additional profitability:	
Incremental sales volume	2,000 units
× Contribution margin per unit (Selling price – variable cost)	
\$120 – \$80	× \$40
Incremental profitability	\$80,000

**Disadvantage**

Incremental bad debts:	
Incremental units × Selling price $2,000 \times \$120$	\$240,000
Bad debt percentage	× 0.05
Additional bad debts	\$12,000

Opportunity cost of funds tied up in accounts receivable:

Average investment in accounts receivable after change in policy:	
Credit sales	Unit cost
_____	_____
Accounts receivable turnover	× Selling price
\$840,000 <sup>a</sup>	\$90.71
_____	_____
6	× \$120
_____	\$105,828

<sup>a</sup> 7,000 units × \$120 = \$840,000

Current average investment in accounts receivable:

\$600,000	\$95	
_____	_____	
12	× \$120	39,583
Additional investment in accounts receivable		\$ 66,245
Minimum return		× 0.16
Opportunity cost of funds tied up		\$ 10,599

$$\sigma_p = \sqrt{0.0089 + 0.0089\rho_{AB}} = \sqrt{0.0089 + 0.0089(0)} = \sqrt{0.0089} = 0.0943 = 9.43\%$$

(c) If  $\rho_{AB} = -1$  (a perfectly negative correlation coefficient), then as the price of A rises, the price of B declines at the very same rate. In such a case, risk would be completely eliminated. Therefore, when  $\rho_{AB} = -1$ , the portfolio risk is:

$$\sigma_p = \sqrt{0.0089 + 0.0089\rho_{AB}} = \sqrt{0.0089 + 0.0089(-1)} = \sqrt{0.0089 - 0.0089} = \sqrt{0} = 0$$

When we compare the results of (a), (b), and (c), we see that a positive correlation between assets increases a portfolio's risk above the level found at zero correlation, whereas a perfectly negative correlation eliminates that risk.

**EXAMPLE 3:** To illustrate the point of diversification, assume data on the following three securities are as follows:

Year	Security X (%)	Security Y (%)	Security Z (%)
2X08	10	50	10
2X09	20	40	20
2X10	30	30	30
2X11	40	20	40
2X12	50	10	50
$r_j$	30	30	30
$\sigma_p$	14.14	14.14	14.14

Note here that securities X and Y have a perfectly negative correlation, and securities X and Z have a perfectly positive correlation. Notice what happens to the portfolio risk when X and Y, and X and Z are combined, assume that funds are split equally between the two securities in each portfolio:

Year	Portfolio XY (50% = 50%)	Portfolio XZ (50% = 50%)
2X08	30	10
2X09	30	20
2X10	30	30
2X11	30	40
2X12	30	50

Year	Portfolio XY (50% = 50%)	Portfolio XZ (50% = 50%)
$r_p$	30	30
$\sigma_p$	0	14.14

Again, see that the two perfectly negative correlated securities (XY) result in a zero overall risk.

### THE CAPITAL ASSET PRICING MODEL

An asset's risk consists of two components: (1) diversifiable risk and (2) nondiversifiable risk.

*Diversifiable risk*, sometimes called *company-specific risk*, *controllable risk*, or *unsystematic risk*, represents the portion of a security's risk that can be eliminated by diversification. This type of risk is unique to a specific company's operations—new products, patents, acquisitions, competition, for example—and thus is not priced.

*Nondiversifiable risk*, sometimes referred to as *market risk*, *noncontrollable risk*, or *systematic risk*, results from forces outside of the firm's control and cannot be eliminated by diversification. The relevant risk of an individual asset is its contribution to the riskiness of a well-diversified portfolio, which is the asset's market risk. Because market risk cannot be controlled by diversification, investors must be compensated for bearing it. The market risk is measured by the *beta* coefficient. Beta measures the extent to which the stock's returns move relative to the market.

The capital asset pricing model (CAPM) relates the market risk to the level of expected or required rate of return on a security. It answers the question: How much return is required to compensate investors for a given amount of risk?

The model is given as follows:

$$r_i = r_f + b(r_m - r_f)$$

where

$r_i$  = the expected (or required) return on security I

$r_f$  = the risk-free security (such as a T-bill)

$r_m$  = the expected return on the market portfolio (such as Standard & Poor's 500 Stock Composite Index)

$b$  = beta, an index of market risk.

In words, the CAPM equation shows that the required (expected) rate of return on a given security ( $r_j$ ) is equal to the return required for securities that have no risk ( $r_f$ ) plus a risk premium required by investors for assuming a given level of risk. The higher the degree of market risk ( $b$ ), the higher the return on a given security demanded by investors.

purpose. A growth company also needs funds to satisfy working capital requirements. Here, 45.8% of financing is necessary to pay overdue accounts payable and accrued liabilities. The firm also needs sufficient cash to capitalize on lucrative opportunities. The present cash balance to total assets is at a low 1.4%.

Long-term debt financing is recommended for the following reasons:

1. The ratio of long-term debt to stockholders' equity is a low 21.8%. The additional issuance of long-term debt will not impair the overall capital structure.
2. The company has been profitable and there is an expectation of future growth in earnings. Internally generated funds should therefore ensue, enabling the payment of fixed interest charges.
3. During inflation, the issuance of long-term debt generates purchasing power gains because the firm will be repaying creditors in cheaper dollars.
4. Interest expense is tax deductible.

**EXAMPLE 27:** On average over the past ten years, Tektronix's return on equity has not been sufficient to finance growth of the business, thus an infusion of new capital from outside sources has been required. Most of the additional capital has been in the form of long-term debt, which represented 13% of total capital in fiscal 2X11 and 21% of total capital in fiscal 2X15.

With expansion of the business expected to accelerate in the next few years after the current lull, but with return on equity likely to remain somewhat depressed because of competitive factors and costs associated with "preparing for the millennium," a need for additional capital is developing. Also, of the \$146 million of long-term debt outstanding at the fiscal 2X15 year-end, nearly \$65 million matures in the fiscal-2X16-to-fiscal-2X18 period. Thus, it is possible that as much as \$100 million of capital may have to be raised to meet all requirements.

In anticipation of capital needs, Tektronix in fiscal 2X15 borrowed funds in the commercial paper market, and the company intends to replace these commercial paper borrowings at some future time with long-term financing.

Given the foregoing circumstances, and also given that Tektronix common stock currently is quoted on the New York Stock Exchange at 160% of book value and that the current interest rate on newly issued triple A industrial bonds of long maturity is 14%, evaluate on an immediate-and longer-term basis each of the following options. Include in your answers economic and capital market assumptions: (a) Tektronix is selling two million shares of common stock at \$50 per share, (b) Tektronix is selling a \$100 million straight debenture issue maturing in 20 years, and (c) Tektronix is selling a \$100 million bond issue convertible into common stock and maturing in 20 years. (CFA, adapted.)

### Solution

- (a) From the timing viewpoint, selling equity is attractive considering price-to-book rates (160%) and comparatively modest dilution (two million shares represents 11% of currently outstanding shares, less impact of after-tax cost of borrowing to be retired). However, price soon could move higher given a better economic environment, earnings recovery, and resultant stronger general stock market. Over the long term, selling equity is expensive, as continuing dividend service is with after-tax dollars. Also, immediate return on equity capital will diminish with reduced leverage as debt matures.
- (b) Increasing debt, net of maturities, to a larger part of total capital is tolerable by most standards. According to the data provided, debt of about \$146 million would increase to around \$181 million ( $\$146 + \$100 - \$65$ ), and by 2X18 this sum presumably would not represent much more than the current 21% subject to earnings retention during the interim. However, this would be an appealing option only if interest rate assumptions indicate other than a rather meaningful decline over the next year or two, and if pro forma interest charge coverage and/or the current lull in the business do not seriously impact the rating and issue price of the bonds. The after-tax cost of debt service will be comparatively low, and so would be the net cost of capital. Another consideration will be sinking fund requirements and call restrictions and price.
- (c) A convertible bond issue has certain disadvantages but it also has advantages: (1) it can be sold at a lower interest cost than a straight debt, and (2) the potential dilution is less than an issue of common reflecting the premium over the common market.

### PRIVATE EQUITY

Private equity is an asset class consisting of equity securities in operating companies that are not publicly traded on a stock exchange. Private equities are generally illiquid and thought of as a long-term investment. Private equity investments are not subject to the same high level of government regulation as stock offerings to the general public. Private equity is also far less liquid than publicly traded stock. Types of private equity include the following:

1. **Venture Capital.** Venture capital refers to equity investments made, typically in companies in their early stages, to either launch, develop, and/or expand a new business. Venture capital investment is often associated with new ideas or products that have not yet been tested. The earlier the investment stage, the greater the risk/return characteristics for the investor. In other words, investing at the very beginning of what may become a profitable technology could offer substantial returns if successful, but the probability of success may not be high. Waiting until a business or idea has begun and just investing in the expansion of that business may provide a lower return, but the investor has a higher probability of success when compared to the start-up investor.