Financial Accounting

A. Introduction

Financial Accounting is concerned with the development and presentation of information about the financial condition of a firm for the use of the firm's stockholders.

A.1. Types of Accounting

(1) Financial Accounting – concerns the development and presentation of data for the shareholders of a public company.

(2) Managerial Accounting – deals with collection and use of data that will help management make business and operational decisions.

(3) Tax Accounting – collection and reporting of data used to determine amount of taxes to be paid to the government.

We will be interested in financial accounting. In some countries (e.g., many in Europe), financial accounting is very similar to tax accounting. In the US, the two have little to do with each other. For example, a corporation could report a profit to its shareholders (financial accounting) but a loss to the government (tax accounting), because the rules that apply to the two types of accounting are different.

A.2. What is a Public Corporation?

Small businesses often have few owners, and are sometimes even owned by a single individual. By contrast,

public corporations often have many owners, sometimes millions of owners. Ownership in a public corporation is represented by shares of stock. If a corporation has 1 million shares of stock outstanding, and an investor purchases 100 of those shares, that individual owns a 1/10,000 portion of that corporation, and is entitled to an equal share of the profits. The owners of a public corporation are often called stockholders or shareholders. Shares of stock are traded on organized exchanges (e.g., New York Stock Exchange or NASDAQ). An investor may purchase shares of stock in a corporation, thereby becoming an owner of that corporation, and keep those shares for many years, or sell them to someone else within minutes.

A board of directors, who are elected by the stockholders, usually governs public corporations. In the US, members of the board of directors have a responsibility to represent the interests of the stockholders. The stockholders are generally interested in increasing their wealth, but sometimes have other motives as well. (Witness the growth of "social responsibility" mutual funds, which invest only in the shares of companies that adhere to some code of conduct. Such a code might specify, for example, that the company's operations must meet certain environmental standards, or worker health and safety standards.)

A.3. Why Do Public Corporations Exist?

Some businesses are owned by individuals, who provide all the funds needed to start that business. However, the

owner may not be able to provide all the funds needed to ensure the growth of that business. If a corporation is growing very rapidly, typically large amounts of cash are needed to build new factories or warehouses, to buy new machinery, to hire new staff, etc. The owner of the business may not have sufficient financial resources to fund this rapid growth, and may therefore sell ownership in the business in order to secure additional funding.

Even if the owner has sufficient financial resources to fund the growth of the business, s/he may not wish to do so. If the owner has a large share of his or her personal wealth invested in the business, and that business fails, the consequences can be devastating. It may therefore be wise to sell a share of the business to someone else, and invest the proceeds from the sale in other assets.

A.4. Why Produce Financial Accounting Statements?

The short answer is, public corporations are required to do so by the Securities and Exchange Commission.

A longer answer is that, accurate disclosure of financial information benefits both the company and potential investors. Someone interested in investing in a public corporation can use accounting information to determine whether the investment is likely to be successful, how risky it is, etc. Furthermore, companies seeking to raise additional funds will find very few people willing to invest if it is unwilling to disclose information about its financial performance.

A.5. Who Sets Accounting Standards?

In the US, legal authority to set financial accounting standards rests with the Security and Exchange Commission (SEC). In practice, the commission relies on the Financial Accounting Standards Board (FASB). When proposing accounting standards, the FASB attempts to balance the interests of varying parties (firms, shareholders, governments, etc.). Although such a balance is probably desirable, standards are often developed by negotiation, and sometimes do not adhere to consistent or logical principles.

A.6. Is the Information in Financial Reports Accurate?

As discussed, the SEC and FASB set standards that corporations must follow when preparing their financial statements. Furthermore, independent auditors inspect a company's reports and perform various tests to make sure that the statements are accurate (e.g., verify that inventory mentioned in the statements actually exists). Nonetheless, there is often considerable room for judgment. Firms may frequently choose one of several accounting methods, and also must estimate certain quantities (e.g., the life of a piece of equipment). Furthermore, the people preparing financial statements may not have strong incentives for being as accurate as possible; for example, the managers may wish to overstate profits in order to receive a larger bonus. It is therefore important to be able to analyze accounting statements, and not simply accept the information presented uncritically.

A.7. What are the Principal Accounting Statements?

The three main accounting statements are:

(1) Balance sheet – presents information about financial condition of a firm at a point in time.

(2) Income (or earnings) statement – presents information about a firm's financial performance over a period of time, usually a year.

(3) Cash flow statement – presents information about the sources and uses of a firm's cash over a period of time, usually a year.

Financial reports often include additional statements, such as a statement of shareholder's equity, information on inventories, etc.

Financial reports almost always include numerous footnotes. The three principal statements are presented in tabular form; footnotes usually provide detailed information about the method by which various entries in the statements were calculated. Footnotes are often just as important as the three principal statements.

B. Balance Sheet

The first accounting statement we will examine is the *balance sheet.*

B.1. Structure

The balance sheet contains three components:

(1) Assets – things that will benefit the firm, by generating future cash flows.

(2) Liabilities – things that will consume cash flows.

(3) Shareholders' equity – the net value (assets minus liabilities) of the firm belongs to the shareholders.

Liquidity – different assets and liabilities are generally listed in decreasing order of liquidity.

B.2. Key Relationship

The balance sheet must satisfy the following relationship:

Assets = Liabilities + Shareholders' Equity

Every transaction must preserve this relationship.

Debits increase assets, decrease liabilities and shareholders' equity. Credits decrease assets, increase liabilities and shareholders' equity.

In every transaction, total debits must equal total credits.

B.3. What to Recognize?

One of the key issues with balance sheets is determining which assets should be recognized.

Generally, the more tangible an asset is, the more likely it is to be recognized as an asset or liability.

Examples – cash, buildings, accounts receivable, and marketable securities are all fairly tangible, and are recognized as assets. Bank loans and taxes due are tangible as well, and are recognized as liabilities.

More examples – good relations with the community, manufacturing expertise, and brand reputation are too intangible to be recognized as assets. Amounts due from lawsuits will often be too uncertain to be recognized as liabilities.

Ambiguous – patents. If a company receives a patent based on internal research, the future cash flows are too difficult to judge to be classified as an asset. However, if a company purchases a patent, there is a transaction that validates the value of that patent.

Goodwill – if a firm acquires another firm for more than its accounting value, the remaining amount is a "goodwill" asset. Goodwill is amortized over periods of up to 40 years, i.e., the amount of goodwill is reduced, and the reduction reduces shareholders' equity. (Note: there is a significant change in goodwill accounting in the works.)

B.4. How to Value Assets and Liabilities?

Assets and liabilities are generally valued based on one of two principles.

Acquisition cost – the original cost for which an asset is purchased, the amount received for an obligation, etc.

Market value –assets/liabilities for which there is a liquid market are often valued at the current market price.

Various adjustments are made, for example, buildings and machines are depreciated over time. So they are originally valued at acquisition cost, but value is reduced to zero over the estimated useful life.

B.5. Book Value vs. Market Value

Because of difficulties in determining which assets and liabilities to recognize, and what value to place on them, market value can often differ substantially from book value. This difference is likely to be larger for some firms than others. For example, a cement producer has mostly tangible assets. A high-tech company has many intangible assets whose value is hard to determine.

C. Income Statement

The next statement we examine is the *income statement*.

C.1. What Appears in Income Statement?

Income statements show revenue earned and expense incurred over a period of time. Revenue minus expense is net income. Net income increases shareholders' equity (and net loss decreases shareholders' equity).

Examples of net income:

(1) Sale of a product to a customer for more than the cost of producing that product.

(2) Sale of a piece of machinery for more than the book value of that machinery.

(3) Winning a lawsuit against a supplier.

Some revenue and expense are associated with specific transactions, but others are not.

Examples (which are associated with a specific transaction?):

(1) Cost of beef, bread, lettuce, tomato, etc. needed to produce a Big Mac.

(2) Revenue from sale of a Big Mac.

(3) CEO's salary.

(4) Cost of preparing annual reports.

(5) Research and development expense.

(6) Advertising brand image.

Note – comprehensive income is an illogical aberration. Certain types of income/expense are excluded from the income statement. We will discuss this point later in the course.

C.2. Cash vs. Accrual

Cash basis – revenues recognized when cash is received form customers. Expenses recognized when cash is paid.

Several problems:

(1) Does not match revenues and expenses well.

(2) Delays revenue recognition.

(3) Offers distortion opportunities.

Accrual basis – revenues recognized at time of sale of goods or provision of service. Expenses recognized at the same time as corresponding revenue.

Expenses not associated with specific revenues generally recognized at time incurred.

C.3. Timing of Revenue Recognition

(1) A firm has performed most services required.

(2) Received cash or some other asset that can be measured.

For many firms, these conditions will be met at time of sale. Note, however, that the more complex the sale, the trickier the issue of revenue recognition gets. Under certain circumstances, firms may recognize revenue before or after a sale is completed.

C.4. Measurement of Revenue

Several important issues arise in the measurement of revenue.

(1) Uncollectible accounts – when goods or services are sold on credit, there is a possibility that the purchases will be unwilling/unable to pay. A firm may therefore fail to collect the agreed upon price for all sales.

(2) Sales discounts – sometimes firms offer discounts or other incentives for prompt payment of bills. At time of sale, it is hard to determine how many customers will take advantage of such incentives.

(3) Sales returns – sometimes customers return products for refunds/exchanges

(4) Delayed payments – firms may offer long-term financing to customers. How much is revenue from sale of goods, and how much is interest from financing?

C.5. Recognition of Expense

In principle, expenses are matched with corresponding revenues. In practice, this is not always so easy:

(1) Some expenses cannot easily be allocated to specific sales (general and administrative, e.g.).

(2) At time of sale, not all associated expenses are known (cost of warranty service, e.g.).

C.6. Relationship between B/S and Income Statement

Income and expense accounts are components of shareholders' equity. They are set to zero at the beginning of an accounting period, and amounts in them are moved to retained earnings at the end. So these accounts are called temporary accounts.

$$Shareholders'Equity = \begin{bmatrix} PaidInCapital \\ +RetainedEarnings \end{bmatrix}$$

$$EndOfPeriodRetainedEarnings = \begin{bmatrix} BeginningOfPeriodRetainedEarnings \\ +Revenues - Expenses - Dividends \end{bmatrix}$$

D. Statement of Cash Flows

The statement of cash flows, like the income statement, shows how the firm's financial condition has changed over a period of time. But there are some important differences.

D.1. What is it and Why?

The statement of cash flows shows a firm's sources and uses of cash over a period of time (same period as the income statement).

Over the lifetime of a firm, total income earned is equal to total cash flows disbursed. However, the two differ in their timing.

We have discussed the advantages of the (required) accrual method of accounting, relative to the cash method. Nonetheless, there are advantages to the knowing the sources and uses of cash.

(1) It is possible for a firm to operate profitably, but be unable to generate sufficient cash to fund expansions, pay off debts, etc.

(2) Profits are somewhat subject to manipulation – values of inventories are sometimes estimated (we will cover inventories later), useful lives of property and equipment must be estimated, etc. Cash doesn't lie.

D.2. Direct and Indirect Methods

Firms could list sources and uses of cash directly, e.g., $10 million collected from customers, $8 million spent on inventories, etc. This method is the direct method. Very few firms do this.

Most firms use the indirect method, which begins with net income. The indirect cash flow statement then reconciles net income with change in cash, by noting those items that generate income (or expense) but not cash, and those items that generate or use up cash but do not generate income or cash.

Examples:

(1) Sale of goods on credit. Generates income, but not cash.

(2) Purchase of Property, Plant, and Equipment. Does not generate income, but uses cash.

(3) Repayment of bank loan. No income effect, but uses cash.

(4) Payment of dividends to shareholders. No income effect, but uses cash.

(5) Depreciation. Reduces income, but no cash effect

D.3. Operations, Investing, and Financing

Cash flow statements are divided into sections on operations, investing, and financing. Classification is somewhat arbitrary.

(1) A firm builds a new factory – investing.

(2) A firm depreciates the same factory – operations.

(3) A firm borrows money from a bank – financing.

(4) A firm makes interest payments on the loan – operations.

(5) A firm repays a loan – financing.

(6) A firm issues new stock in exchange for cash – financing.

(7) A firm buys securities – investing.

(8) A firm receives interest or dividends from securities – operations.

(9) A firm sells back securities – investing.

D.4. Relationship To Other Statements

Assets = Liabilities

+Shareholders' Equity

$$\Delta\text{Assets} = \Delta\text{Liabilities} + \Delta\text{Shareholders' Equity}$$

$$\Delta\text{Cash} + \Delta\text{NonCashAssets} = \Delta\text{Liabilities} + \Delta\text{PaidInCapital} + \Delta\text{RetainedEarnings}$$

$$\Delta\text{Cash} = -\Delta\text{NonCashAssets} + \Delta\text{Liabilities} + \Delta\text{PaidInCapital} + \text{NetIncome} - \text{Dividends}$$

$$\Delta\text{Cash} = \text{NetIncome} - \Delta\text{NonCashAssets} + \Delta\text{Liabilities} + \Delta\text{PaidInCapital} - \text{Dividends}$$

E. Receivables and Revenue Recognition

Firms must have a revenue recognition policy. It is not always obvious when revenue should be recognized, and how much to recognize.

E.1. When do Firms Earn a Profit?

A business earns a profit when it engages in activity such that the net change in assets is positive (i.e., some combination of increases in assets or decreases in liabilities).

(1) Amazon.com sells *The Best of Guy Lombardo and His Royal Canadians* CD for $9.97. Amazon will earn a profit if the cost of acquiring, selling, and delivering the CD is less than $9.97.

(2) United Airlines charges $211.50 for a round-trip economy class ticket between Newark and Chicago. United earns a profit if the revenues received for a flight exceed the salaries of the pilot, flight attendants, etc., the depreciation on the airplane, associated ground costs, etc.

E.2. When should a firm recognize profits?

Producing a product or delivering a service is often an extended process. For example, consider the process Pfizer must go through when introducing a new drug:

(1) Conceive the idea for the new drug.

(2) Design/develop the new drug.

(3) Conduct clinical trials for safety and effectiveness.

(4) Secure approval from regulatory agencies.

(5) Manufacture the drug.

(6) Sell the drug.

(7) Deliver the drug.

(8) Collect cash from customers.

(9) Accept returns/spoilt shipments.

At what point has Pfizer "earned" its profit? How aggressive/conservative should they be in recognizing revenue?

GAAP permits revenue recognition when:

(1) A firm has performed all, or a substantial portion of, the services it expects to provide or, in the case of product warranties, can forecast with reasonable precision the cost of providing the future services.

(2) A firm has received cash, a receivable, or some other asset capable of reasonably precise measurement or, if the firm has offered to let the customer return the product for a refund, the firm can estimate the returns with reasonable precision.

Often satisfied at time of sale, but sometimes at other times.

E.3. Revenue Recognition at Time of Sale

Although revenue may be recognized at time of sale, the transaction may not be over yet.

(1) Returns.

(2) Warranties.

(3) Collection of cash.

How should we account for non-collectible accounts?

E.3.a. Direct Write-Off

Provided for illustrative purposes, this method is not GAAP!

All sales are recognized as revenue:

(1) Debit Accounts Receivable.

(2) Credit Sales.

When specific accounts are identified as non-collectible, write them off:

(1) Credit Accounts Receivable.

(2) Debit "Bad Debt Expense."

Does not match revenue with associated expenses, and provides opportunity for manipulation. In general, accounts receivable will not reflect amount of cash firm realistically expects to collect.

However, this method is used for income tax purposes.

E.3.b. Allowance Method

Estimate amount of accounts receivable that will not be collected. Make adjusting entry:

(1) Credit contra-asset "Allowance for Uncollectible Accounts."

(2) Debit expense (or contra-revenue) "Provision for uncollectibles."

When specific accounts are identified as non-collectible, make entry:

(1) Credit Accounts Receivable.

(2) Debit Allowance for Uncollectible Accounts.

Income effect is entirely at time of original sale.

E.3.c. Estimating Allowance

There are two main methods for estimation the allowance used under the allowance method.

E.3.c.1. Percentage-of-sales method

Management estimates percentage of sales that will be uncollectible, based on past experience

Subject to manipulation?

E.3.c.2. Aging-of-Accounts-Receivable Method

Firm keeps track of age of receivables in accounts receivable – not due, past due 30 days, etc.

Estimates percentage of each category that will be uncollectible.

Subject to manipulation?

Although we have discussed the allowance method in reference to receivable, it applies to many other areas.

(1) Returns

(2) Warranties

E.4. Revenue Recognition Before Sale

Long-term contractors often use this method.

(1) Period of construction spans multiple accounting periods.

(2) Firm identifies a customer and agrees on a price in advance.

(3) Buyer makes periodic payments.

E.4.a. Percentage of Completion Method

Based on amount of work completed - recognize equal percentage of revenue.

Example – 10% of the work required to build a new battleship is completed this year. Revenue on 10% of the sale price is recognized.

Revenue recognition in this case is not based on amount of cash collected from customers!

This approach matches expenses matched with revenues.

E.4.b. Completed Contract Method

Revenue and expense are recognized when job is finished, and expenses are capitalized until job is finished.

E.5. Revenue Recognition After Sale

This method is permitted only when seller cannot be reasonably certain about cash collection.

E.5.a. Installment Method

Revenue and Expense are recognized as cash is collected from customer.

Example – firm sells goods for $200 that cost $150 to produce. Buyer makes initial payment of $40, or 20% of sale price. Firm recognizes revenue of $40, and expense of $150*20%=$30.

E.5.b. Cost-Recovery-First Method

This method is used when there is uncertainty about amount of cash to be collected, and recognizes revenue dollar for dollar with expenses as cash is collected. When costs are recovered, additional cash collected is profit.

Example – same facts as before, but cost-recovery-first method. Firm recognizes revenue of $40 and expense of $40. No profit is recognized until an additional $110 (for a total of $150) is collected from buyer. After payments of $150, cost of sales is covered, and additional payments are recognized as profit.

F. Inventory

When accounting for the values of inventory, we must address several issues.

F.1. Costs Included in Purchased Inventory

Inventories may be purchased or manufactured. For example, a grocery store probably purchases most of its inventory; General Motors most likely manufactures its inventory. When inventories are purchased, there are two main issues that arise in determining the cost of acquisition.

F.1.a. Timing

The issues discussed during the balance sheet part of the course apply to inventories – when should they be recognized as an asset? This could be before or after time of physical shipment. To determine when inventories should be recognized, it may be useful to ask questions such as, "If the goods were stolen, who would bear the loss?" If the answer is "the seller," they are not yet an asset.

F.1.b. Adjustments to Purchase Price

When purchasing merchandise, a firm will often incur additional costs such as shipping, and may receive discounts for prompt payment, credit for returns, etc. Accounting for these adjustments is similar to accounting for bad debt, warranty expenses, etc., as discussed in the receivables part of the course. Increases in purchase price are recorded in adjunct accounts; decreases in purchase price are recorded in contra accounts.

F.2. Costs Included in Manufactured Inventory

Full absorption costing – required for both financial reporting and tax purposes. (For managerial accounting purposes, it may be better to use another technique such as variable costing.) All costs associated with production of goods are debited to inventory.

Revenue is usually recognized at time goods are sold – matching principle dictates that associated expenses should be recognized at the same time.

F.2.a. Inventory Accounts for Manufacturing Firms

Manufacturing firms often keep inventory in several different accounts:

(1) Raw materials inventory – materials purchased from suppliers but not yet used in manufacturing process.

(2) Work-in-process inventory – costs associated with goods in a partially processed state – i.e., neither raw materials nor finished goods.

(3) Finished goods inventory – costs associated with goods in a completed state, ready for sale.

F.2.b. Costs Included in Manufactured Inventory

Manufactured inventory costs include raw materials purchased to produce goods, wages and other labor costs directly associated with production of foods, and manufacturing overhead costs (such as depreciation and taxes on factories).

Other expenses, such as selling and administrative expenses, are treated as period expenses – i.e., they are recognized as expense, and are not included in inventory values.

F.2.c. Full Absorption vs. Variable Costing

Variable costing treats fixed costs as a period expense. This method is useful for internal decision making, but is not permitted for financial reporting (or for tax purposes).

F.3. Cost Basis for Inventory

No fewer than five methods!

F.3.a. Acquisition Cost Basis

The cost of inventory is the historical cost, and profit/loss from the sale of the inventory at a different price is recognized at time of sale.

F.3.b. Replacement Cost

Replacement cost is the price of a fair market transaction between a willing buyer and a willing seller.

No transaction actually takes place – who decides what is "fair"?

F.3.c. Net Realizable Value

How much could a firm realize as a seller in a transaction with a willing buyer?

This method presents problems if inventory is still in process – in this case, the selling amount of finished

product is reduced by cost of completing the manufacturing process.

F.3.d. Lower-of-Cost-or-Market

(1) Conservative

(2) Complicated

(3) Required

First, we compute market value – choose middle value out of:

(1) Replacement Cost

(2) Net Realizable Value

(3) Net Realizable Value less Normal Profit Margin

Then choose lower of:

(1) Market value

(2) Acquisition cost

F.4. Timing of Computations

Inventory cost calculations are either calculated periodically or continuously.

F.4.a. Periodic System

At time of sale (or other time of revenue recognition), simply ignore cost of inventory delivered to customer. At

the end of an accounting period, physically count inventory and assign a cost.

Cost of sales is calculated:

$$\underbrace{Beginning\ Inventory}_{\text{known}} + \underbrace{Purchases}_{\text{known}} - \underbrace{Ending\ Inventory}_{\text{counted and costed}} = \underbrace{Costof\ GoodsSold}_{\text{calculated}}$$

Whatever is missing at the end of the accounting period, is assumed to have been sold. (No differentiation between sales, theft, spoilage, etc.)

F.4.b. Perpetual System

Reductions in inventory are recorded as expenses at time of sale.

A physical count is still required to resolve discrepancies between calculated and actual ending inventory value.

$$\underbrace{Beginning\ Inventory}_{\text{known}} + \underbrace{Purchases}_{\text{known}} - \underbrace{Withdrawls}_{\text{recorded}} = \underbrace{Ending\ Inventory}_{\text{calculated}}$$

Discrepancies revealed by physical count (shrinkage) are recorded as an expense (loss), either as an increase in Cost of Goods Sold or a separate expense account.

Perpetual system is likely to provide benefits to a firm, by providing information that can be used to manage inventories more efficiently. Improved technology has made perpetual systems much more feasible.

F.5. Cost Flow Assumptions

When inventory consists of items acquired at different times at different costs, what is cost of an item sold?

F.5.a. Specific Identification

When the item sold can be identified reliably, a firm may recognize Cost of Goods Sold as the cost of the specific item sold.

(1) TV sets have serial numbers.

(2) It is easy to keep track of jumbo jets.

Sometimes specific identification is not possible or practical.

(1) When the underground storage tanks at a filling station are refilled, the new gas and the old gas are mixed together.

(2) Ball bearings could have individual serial numbers etched in by laser, but it probably isn't worth the trouble.

Even when specific identification is possible, a firm may find it advantageous to use another method. There are three alternate methods – note that the method used does not have to match the actual physical flow of goods!

F.5.b. FIFO: First-In, First-Out

Also called LISH: Last-In, Still-Here.

Inventory sold is considered to be the least recently purchased.

What is the impact on the income statement? This method matches current sales with non-current costs.

What is the impact on the balance sheet? Inventory values reflect current values.

F.5.c. LIFO: Last-In, First-Out

Also called FISH: First-In, Still-Here.

Inventory sold is considered to be the most recently purchased.

What is the impact on the income statement? This method matches current sales with current costs.

What is the impact on the balance sheet? Inventory values are sometimes very out of date.

F.5.d. Weighted Average

Cost of goods sold reflects average cost of inventory on hand.

F.5.e. Comparisons

In times of generally rising prices (in the US, most of the 20th century), LIFO usually produces the lowest reported income because it matches sales with the most recently acquired (and therefore most expensive) inventory. FIFO usually produces the highest reported income because it

matches sales with the least recently acquired (and therefore least expensive) inventory. Beware the LIFO liquidation, though…

F.5.f. LIFO Liquidation

Suppose a firm continually sells its product over a many year period, but also continually purchases/manufactures inventory amounts in excess of sales? What happens then?

Inventory becomes very large, since the firm always acquires more in inventory than it sells. With FIFO, the inventory on the balance sheet is the most recently acquired inventory, and reflects current costs.

With LIFO, each year, a new layer of inventory is acquired. So long as amounts purchased or manufactured exceed amount sold, the layer acquired this year will remain forever. Each year, new layers will be deposited on top of it.

Under LIFO, the inventory on the balance sheet therefore consists of many layers acquired at different times, some of them very old, and reflecting very old costs of acquisition/manufacture.

Now, suppose the firm continues to sell the product, but ceases to purchase/manufacture replacement inventories. What happens?

With FIFO, this is not a big deal. The inventory on the balance sheet reflects relatively recent cost, and this is the

cost that goes into Cost of Goods Sold as the product is sold.

With LIFO, the effect is similar at first. The product sold is the "last in," which was acquired recently, and reflects recent costs. But, after this layer is gone, the firm dips into the next layer down, which is older and reflects less recent costs. As inventory is depleted further, the firm dips into older and older LIFO layers, reflecting older and older acquisition costs. In a time of generally rising prices, these older acquisition costs will grossly understate the value of the inventory sold, and consequently the profit earned will be very large.

A liquidation of LIFO layers can therefore result in very large profits. Why? For many years, the firm has been reporting lower profits with LIFO than would have been the case with FIFO. However, the firm has failed to "mark up" the very old inventory costs to market value. When this inventory is sold, the years of profits foregone through use of LIFO are suddenly realized.

What are the opportunities for manipulation?

G. Plant, Equipment, and Intangible Assets

A firm generally acquires numerous long-lived or intangible assets. Accounting for the value of these assets presents several issues.

G.1. Amortization

Amortization (bringing to death) is the process of allocating the cost of long-lived assets over their lifetimes. Equipment, buildings, machinery, etc. are depreciated. Oil wells, diamond mines, etc. are depleted. Intangible assets such as patents don't get their own special term, and are simply amortized.

Amortization is an application of the matching principle – an asset that is expected to produce revenues for many accounting periods has its cost allocated to those same accounting periods.

G.2. Acquisition Cost

G.2.a. Acquired Assets

The cost basis of an acquired asset includes not only the purchase price, but also costs incurred in preparing the asset for service. Example – cost of machine include purchase price, cost of transporting it to factory, cost of engineering survey of installation site, etc.

G.2.b. Self-constructed assets

When a firm produced a long-lived asset itself, the cost basis of the asset includes costs of production (labor,

materials, overhead attributable to production of the asset). Also included is capitalized interest.

Example - a firm purchases land and builds a golf course. The project takes several years, and generates no sales or revenue until the golf course is complete. During the first year, the average balance in the "Golf Course under Construction" account is $600,000. Provided the firm has at least $600,000 in debt, interest charges on this amount are added to the cost of the golf course.

Interest rate to use in calculating capitalized interest – if the firm issued new debt to pay for production of the asset, the interest rate on the new debt is used to calculate the amount of capitalized interest. If the amount of new debt issued is less than the cost of the asset, then the firm's average cost of existing debt is used to calculate the remainder. The amount of interest capitalized cannot exceed the total amount of interest incurred during the accounting period.

Scenario 1 – the firm borrowed $600,000 at 14% to build the golf course. $84,000 in capitalized interest is added to the cost.

Scenario 2 – the firm borrowed $200,000 at 14% to build the golf course, and has $1,000,000 in other debt outstanding at 12%. Then $28,000+$48,000=$76,000 is added to the cost of the golf course.

Scenario 3 - the firm has no debt and therefore incurs no interest. No capitalized interest is added to the cost of the golf course.

As shown, the acquisition cost of the golf course is not independent of the manner in which it was financed.

Capitalized interest delays the recognition of expense. If interest were not capitalized, it would be recognized as expense as it is incurred. When capitalized, however, it is included in the acquisition cost of an asset and recognized as expense only as the asset is depreciated.

G.3. Depreciation

Depreciation is a process of cost allocation. Long-lived assets are purchased (and often paid for) in advance, but provide benefits over many years. Expense is recognized as the benefit is provided, not at time of acquisition.

Depreciation is an expense. As such, firms may wish to recognize depreciation as quickly as possible for tax purposes (in order to get tax deductions sooner rather than later), but as slowly as possible for financial reporting purposes (in order to make net income look good).

G.3.a. Depreciation is Cost Allocation

The word "depreciation" is often used to mean a decline in value. This is not necessarily accurate for accounting purposes. Certainly an asset would tend to decline in value as its productive capacity is used up, but this isn't always the case.

Example – a factory produces memory chips for computers. A fire destroys the factory of a competitor where similar chips are made. A shortage ensues, and the price of

memory increases dramatically. The factory is certainly more valuable now (because the product it produces is more valuable), but historical cost-based accounting doesn't recognize this. It does recognize depreciation on the factory this year, though.

G.3.b. Salvage Value

Many assets are worth something even at the end of their useful lives. For example, a metal stamping machine may have value for spare parts even when it is no longer capable of stamping metal. Only the acquisition cost minus salvage value should be depreciated.

Salvage value can be negative. (Example – nuclear power plant.)

For tax purposes, salvage values can be ignored when calculating depreciation.

G.3.c. Service Life

In order to calculate depreciation charges, we must estimate the useful life of an asset.

The Modified Accelerated Cost Recovery System allows rapid depreciation for tax purposes. The IRS specifies the useful life on asset based on its type (e.g., 5 years for trucks, 27.5 years for residential rental property), and a firm can depreciate assets at this rate even if it is shorter than the estimated useful life of the asset. MACRS may not be used for financial reporting purposes, however.

G.3.d. Straight-Line Depreciation

Under this method, the depreciable basis of an asset (its acquisition cost minus salvage value) is allocated equally over its estimated useful life:

$$AnnualDepreciation = \frac{AcquisitionCost - SalvageValue}{EstimatedLife}$$

Example – a machine cost $500,000 to acquire, and has a salvage value of $50,000. The estimated useful life of the machine is six years. The annual depreciation charge is:

$$\begin{aligned} AnnualDepreciation &= \frac{\$500,000 - \$50,000}{6} \\ &= \frac{\$450,000}{6} \\ &= \$75,000 \end{aligned}$$

G.3.e. Straight-Line Use Depreciation

Rather than depreciating an asset equally over equal time periods, we may choose to depreciate it based on the number of units produced in a given accounting period:

$$DepreciationPerUnit = \frac{AcquisitionCost - SalvageValue}{EstimatedNumberUnits}$$

Example – same as above, but the machine is expected to produce 1,000,000 units over its life. 115,000 units are produced the first year.

$$DepreciationPerUnit = \frac{\$500,000 - \$50,000}{1,000,000} = \$0.45$$

$$DepreciationForYear = \$0.45 \bullet 115,000 = \$51,750$$

G.3.f. Declining Balance Methods

Multiply a fixed rate against the net book value. Net book value here is acquisition cost minus accumulated depreciation (salvage value is not subtracted out, but depreciation stops when net book value reaches salvage value).

The rate is calculated as follows:

$$DepreciationRate = 1 - \left(\frac{SalvageValue}{AcquisitionCost} \right)^{\frac{1}{UsefulLife}}$$

Because this formula involves mathematical operations beyond the abilities of many accountants, approximations and rules of thumb or often used instead.

G.3.f.1. Double declining balance

Depreciate an asset with 10 years of useful life at a rate of 20% per year.

Declining balance methods usually switch over to straight line near end of asset life.

G.3.f.2. Sum-of-the-Year's-Digits Method

We multiply the acquisition cost by a fraction. The numerator is the number of years of remaining life at the

beginning of the current accounting period; the denominator is the sum of all such numbers for each year of service life.

Example – five years of service:

$$Depreciation(1) = \begin{bmatrix} AcquisitionCost \\ -SalvageValue \end{bmatrix} \bullet \frac{5}{1+2+3+4+5}$$

$$Depreciation(2) = \begin{bmatrix} AcquisitionCost \\ -SalvageValue \end{bmatrix} \bullet \frac{4}{1+2+3+4+5}$$

$$Depreciation(3) = \begin{bmatrix} AcquisitionCost \\ -SalvageValue \end{bmatrix} \bullet \frac{3}{1+2+3+4+5}$$

$$Depreciation(4) = \begin{bmatrix} AcquisitionCost \\ -SalvageValue \end{bmatrix} \bullet \frac{2}{1+2+3+4+5}$$

$$Depreciation(5) = \begin{bmatrix} AcquisitionCost \\ -SalvageValue \end{bmatrix} \bullet \frac{1}{1+2+3+4+5}$$

G.3.g. MACRS

The Modified Accelerated Cost Recovery System is often used for tax purposes. The depreciation period is normally shorter than the actual useful service life of the asset.

Declining balance method – assets in 3-, 5-, 7-, and 10-year class use the 200-percent declining balance method. Assets in the 15 and 20-year classes use 150-percent declining balance method. Other assets are straight line. (The asset is assumed to have been purchased in mid-year.) In practice, one can just use published tables.

This method ignores salvage value.

G.3.h. Repairs and Maintenance

Repairs and maintenance are considered period expenses.

G.3.i. Improvements

Improvements are considered new asset acquisitions. Either a new asset is created, or the value of the existing asset is increased.

Distinguishing between repairs and improvements is often a matter of judgment.

G.3.j. Impairment

An asset impairment occurs when the sum of expected undiscounted cash flows has declined below the book value of an asset. An impairment may occur because of changes in the nature of the asset (e.g., physical damage), market conditions, etc.

When an impairment occurs, the asset is written down to either market value, or, if market value cannot readily be determined, to the expected net present value of the future cash flows.

The old acquisition cost (or other basis) and accumulated depreciation are removed from their respective accounts, and the new cost basis is recorded. Any difference is a loss on impairment.

G.3.k. Retirement

When an asset is sold or disposed off, the acquisition cost (or other basis) and the accumulated depreciation are removed from the respective accounts. If the net value of the asset is different than the proceeds, then the difference is recorded as a gain or a loss.

G.4. Depletion

Depletion is the term that describes cost allocation as natural resources are consumed. There are two main methods.

(1) Full costing – all explorations are capitalized as long as the expected benefits from successful efforts will cover costs of all efforts.

(2) Successful efforts costing – only costs associated with successful explorations are capitalized; others are treated as expense.

Example – an oil company drills 8 wells at cost of $8.8 million. One well has recoverable oil worth an estimated $13 million. With full costing, the entire $8.8 million is capitalized and then depleted over the life of the successful well. With successful efforts costing, $7.7 million is treated as expense, and the $1.1 million is capitalized and then depleted.

The most common method of depletion is units-of-production, which is analogous to the straight-line-use method of depreciation.

G.5. Intangible Assets

US GAAP generally recognizes purchased intangibles as assets, but does not recognize internally developed intangible assets.

What is the effect on financial ratios, such as return on assets?

G.5.a. Research and Development

The benefits of R&D expenditure are considered too difficult to quantify, and the expenditures are therefore immediately recognized as expense.

G.5.b. Patents

If purchased, patents are treated as an asset, and amortized over the remaining legal life, or the economic life of the product.

If a patent is not purchased (i.e., developed internally), it is not treated as an asset, does not appear on the balance sheet, and is not amortized.

G.5.c. Advertising

Advertising is treated as an expense when incurred.

G.5.d. Goodwill

Goodwill is the excess price paid over *fair market value* for net assets in acquisition.

Goodwill is usually amortized over 40 years, but the rules changed in 2001.

G.6. Which Method to Use?

Firms will often want to choose an amortization method for financial reporting purposes that results in high net income. For tax purposes, the goal is probably to receive the largest possible current tax deduction.

H. Liabilities: Introduction

Liabilities present a number of recognition and valuation issues.

H.1. Recognition

A liability is recognized when three conditions are met:

(1) The obligation involves probable sacrifice of future resources at a certain time. The firm can estimate the cash value of the obligation with reasonable precision.

(2) The firm cannot avoid the obligation.

(3) The transaction or event creating the obligation has occurred.

Examples of liabilities:

(1) Bonds issued.

(2) Wages and taxes accrued.

(3) Warranty repair obligation.

(4) Customer prepayments.

Executory contracts are not liabilities.

Contingencies – potential obligations arising from events that have occurred, such as lawsuits for injuries caused in

accidents, obligation to clean-up toxic waste on property owned, etc. Contingencies are generally not considered liabilities. For example, suppose a firm sells a product, and the purchaser is seriously injured while using the product. The event that causes the liability is not considered the sale of the product, but the outcome of the legal process. Contingencies are disclosed in the notes to financial statements.

H.2. Valuation

Liabilities are valued at the present value of the expected future payments. That is, future payments must be discounted at some interest rate.

Example: a firm has financed the purchase of a piece of machinery. In one year, the firm must pay $33.6 million. The appropriate interest rate is 12%. The amount of the liability is:

$$PV = \frac{\$33.6 \text{ million}}{1+12\%} = \frac{\$33.6 \text{ million}}{1.12} = \$30 \text{ million}$$

The firm uses historical interest rates. For example, suppose the $33.6 million obligation above is the repayment of a bank loan, and the bank is charging 12% interest. Then the firm uses 12% to calculate the present value of the final payment, even if the interest rate increases or decreases substantially.

Current liabilities are usually valued at an undiscounted value, since the effect of discounting would normally be very small.

H.3. Current Liabilities

(1) Accounts payable

(2) Wages payable

(3) Payroll taxes

(4) Paid vacations – accrue liability when earned, reduce liability as employees take vacation

(5) Income taxes payable – estimated for each reporting period, paid quarterly

(6) Advances from Customers

(7) Product Warranties

(8) Short-term Notes – a note payable is financing from bank or other source for less than one year. A liability is recorded when the obligation is incurred, and interest is accrued over time. Payments first reduce interest payable, then notes payable.

H.4. Long-term Liabilities

Interest usually paid over life of liability rather than at end.

Three relevant quantities:

(1) Amount of liability incurred.

(2) Interest rate charged.

(3) Amount of payments needed to discharge liability.

In general, only two of the above quantities are known, and the third must be solved for. Sometimes only one quantity (3) is known.

H.4.a. Amount of Liability and Interest Rate Known

Sometimes the firm incurs a liability by receiving cash from a creditor. For example, the firm may take a loan from a bank, and agree to repay the amount with interest.

Example – a firm borrows $100,000 at 12% interest, interest payments due annually, with the principal to be repaid after five years. The cash flows are $12,000 at the end of each of the first four years, and $112,000 at the end of the fifth year.

In this case, the value of the liability is equal to the amount of the cash received. The interest expense is $12,000 per year, and the final payment includes $12,000 in interest and $100,000 in principal.

H.4.b. Amount of Liability and Amount of Repayment Known

It may be that the amount of cash received is known, and amount of payments made are also known, but the interest rate is unspecified. In this case, we must calculate an Internal Rate of Return (IRR) that equates the amount of

the liability with the present value of all the future payments. This IRR is then the interest rate used to calculate interest expense.

Example – a firm issues bonds for $1000. Each bondholder will receive payments of $120 each year for the next ten years, with a final payment of $1000 (plus interest). The IRR for this bond is 12%:

$$\$1000 = \frac{\$1000}{(1+12\%)^{10}} + \sum_{i=1}^{10} \frac{\$120}{(1+12\%)^{i}}$$

Let's take a look at how things change each year:

Year	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					1000
1	1000	120	120	0	1000
2	1000	120	120	0	1000
3	1000	120	120	0	1000
4	1000	120	120	0	1000
5	1000	120	120	0	1000
6	1000	120	120	0	1000
7	1000	120	120	0	1000
8	1000	120	120	0	1000
9	1000	120	120	0	1000
10	1000	120	1120	1000	0

Example – a firm issues bonds for $886.99. Each bondholder will receive payments of $100 each year for the next ten years, with a final payment of $1000 (plus interest). The IRR for this bond is 12%:

$$\$886.99 = \frac{\$1000}{(1+12\%)^{10}} + \sum_{i=1}^{10} \frac{\$100}{(1+12\%)^{i}}$$

Let's take a look at how things change each year:

Year	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					886.99
1	886.99	106.44	100	-6.44	893.43
2	893.43	107.21	100	-7.21	900.64
3	900.64	108.08	100	-8.08	908.72
4	908.72	109.05	100	-9.05	917.77
5	917.77	110.13	100	-10.13	927.9
6	927.9	111.35	100	-11.35	939.25
7	939.25	112.71	100	-12.71	951.96
8	951.96	114.24	100	-14.24	966.2
9	966.2	115.94	100	-15.94	982.14
10	982.14	117.86	1100	982.14	0

Example – a firm issues bonds for $1,113.01. Each bondholder will receive payments of $140 each year for the next ten years, with a final payment of $1000 (plus interest). The IRR for this bond is 12%:

$$\$1{,}113.01 = \frac{\$1000}{(1+12\%)^{10}} + \sum_{i=1}^{10} \frac{\$140}{(1+12\%)^{i}}$$

Let's take a look at how things change each year:

Year	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					1113.01
1	1113.01	133.56	140	6.44	1106.57
2	1106.57	132.79	140	7.21	1099.36
3	1099.36	131.92	140	8.08	1091.28
4	1091.28	130.95	140	9.05	1082.23
5	1082.23	129.87	140	10.13	1072.1
6	1072.1	128.65	140	11.35	1060.75
7	1060.75	127.29	140	12.71	1048.04
8	1048.04	125.76	140	14.24	1033.8
9	1033.8	124.06	140	15.94	1017.86
10	1017.86	122.14	1140	1017.86	0

So far, we have been talking about bonds. A mortgage is similar, although the payments are generally calculated so that the debt is extinguished without a large final payment, i.e., the principal is repaid a little bit each month rather than all at once at the end.

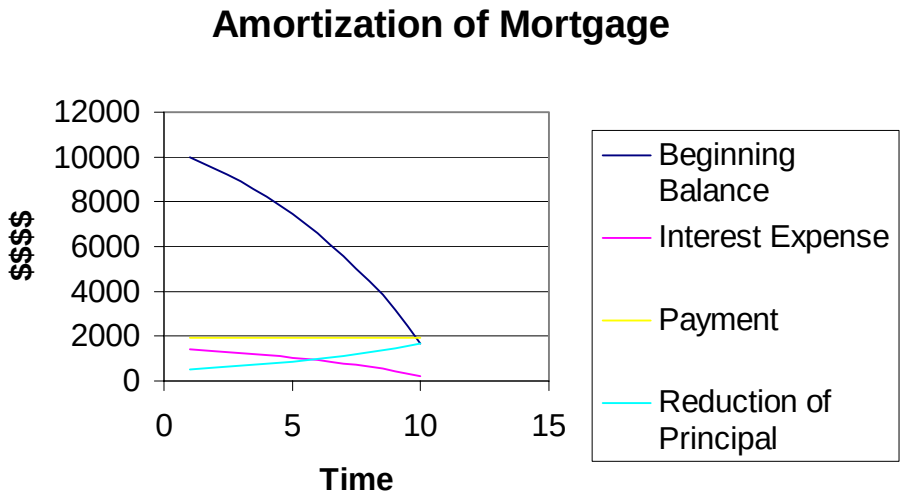
Example – a firm buys some equipment, agreeing to pay $1,917.13 at the end of the year for each of the next ten years. The fair market value of the equipment is $10,000. The IRR is 14%:

$$\$10,000 = \frac{\$1917.13}{(1+14\%)^{10}}$$

Year	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					10000
1	10000	1400	1917.13	517.13	9482.87
2	9482.87	1327.6	1917.13	589.53	8893.34
3	8893.34	1245.07	1917.13	672.06	8221.28
4	8221.28	1150.98	1917.13	766.15	7455.13
5	7455.13	1043.72	1917.13	873.41	6581.72
6	6581.72	921.44	1917.13	995.69	5586.03
7	5586.03	782.04	1917.13	1135.09	4450.94
8	4450.94	623.13	1917.13	1294	3156.94
9	3156.94	441.97	1917.13	1475.16	1681.78
10	1681.78	235.35	1917.13	1681.78	0

(Note that the last interest expense entry is off by $0.10; this was necessary to correct for rounding error over the life of the mortgage.)

Because the balance outstanding changes substantially over the life of a mortgage, the amount of interest charged each period also changes a lot:



H.4.c. Amount of Repayment Known

Sometime only the amount of the future payment is known. For example, a firm may agree to purchase equipment for $100,000, with payment due in two years. No current value of the equipment is specified, and no interest rate is mentioned either.

There are two ways to proceed:

(1) Use the current value of the equipment to value the liability. Find the IRR that equates the current value to the present value of the payments.

(2) If the current value of the equipment purchased cannot be ascertained reliably, then the firm must estimate the interest rate it would be on a similar loan. The payments can then be discounted to the present, and the result is the value both of the liability and the asset acquired.

Example – the firm purchases equipment for $100,000, payable in two years. The current value of the equipment is $80,000. The IRR is 11.8034%:

$$\$80,000 = \frac{\$100,000}{(1+11.8034\%)^2}$$

The amortization table is:

Year	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					80000
1	80000	9442.72	0	-9442.72	89442.72
2	89442.72	10557.28	100000	89442.72	0

Example – the firm purchases equipment for $100,000, payable in two years. The equipment is very specialized, and it is not possible to estimate accurately its current value. However, the firm can generally get two year bank financing for 12% for loans such as this one. The present value of the liability is then $79,719.39:

$$\$79,719.39 = \frac{\$100,000}{(1+12\%)^2}$$

This is the value of both the liability and of the acquired asset. The amortization table is:

Year	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					79719.39
1	79719.39	9566.33	0	-9566.33	89285.72
2	89285.72	10714.28	100000	89285.72	0

Note that, in this case and in all others we have looked at, the total amount of expense does not depend on the interest rate – call cash payments will eventually be written off as expense. Different interest rates lead to different assumptions about:

(1) The amount of the cash payments that is considered interest vs. acquisition cost of an asset. (Since the

asset will be depreciated, it will all eventually be expense.)

(2) The timing of expense recognition. The depreciation of the asset may be different than the term of the financing, so different interest rates lead to different time patterns of expense.

H.4.d. Retirement before Maturity

A firm may have the option to pay off debt before it is due. For example, bonds are sometimes issued with a call provision, that allows the issuer to discharge the obligation in full by making a prespecified payment, usually somewhat more than the face value. If the bond is called, no further payments will be made. Many corporate bonds are callable. Or a firm may simply repurchase its bonds on the open market. Mortgages may have prepayment options, etc. When a debt is discharged early, the amount paid will usually not be equal to the carrying value of the debt. The difference is recorded as a gain or a loss.

H.5. Manipulation

There are at least two significant ways a firm can manage its long-term liabilities to manipulate net income.

H.5.a. Timing of Sale

Long-term liabilities such as bonds are valued using the historical interest rate. Suppose that interest rates have increased significantly. Then the market value of the bonds has declined significantly. However, the book value of the bonds has not changed.

The issuer could choose to purchase back some bonds and retire them. Since the market value of the bonds is significantly lower than the book value, the issuer will record a gain when repurchasing the bonds. So a company that is expecting poor net income for the year could give itself a little boost by repurchasing some its bonds, either with cash available or with cash received by issuing replacement bonds at the (new) interest rate.

For this reason, gains on early retirement of debt must usually be shown as an extraordinary gain on the income statement.

H.5.b. Constructive Liabilities

Constructive liabilities are obligations that arise because of decisions a company has made, for example, to close a factory. Workers may have a contract that requires severance pay; buildings and equipment may incur expenses while being dismantled, etc.

Firms sometimes recognize these expenses in advance, i.e., create a liability (e.g., Employee Severance Pay) and charge it as an expense (e.g., Restructuring Charges). Then when the severance pay is actually paid, it isn't an expense, but a reduction in the liability.

No problem so far, but a firm could overestimate restructuring charges. Then, when actual expenditures come up short, the liability can be reduced, and this reduction is a gain, added to current year income.

FASB is concerned that companies are using constructive liability accounts to transfer net income from good years to bad years – overestimate constructive liabilities when net income is high, and then reduce them when net income is low.

I. Liabilities: Additional Topics

I.1. Off-Balance Sheet Financing

Firms may wish to avoid showing debt on the balance sheet for two reasons.

I.1.a. Financial Ratios

Consider the debt equity ratio. When a firm purchases an asset and finances the cost, both debt and equity go up. However, the debt-equity ratio also goes up, making the firm appear more risky. If the firm can obtain the economic benefit of the asset without showing either the asset or the liability on the balance sheet, it will appear less risky.

Example – a firm has debt of $50 million, and total equities of $100 million. The debt/equity ratio is 0.5. This firm now purchases a building for $20 million, and finances the entire cost. Both an asset (the building) and a liability (the required payments) appear on the balance sheet. Debt has increased to $70 million, but equity increases to $120 million; the debt/equity ratio is now 0.5833.

Suppose instead that the firm leases the building. The required lease payments are exactly equal to the payments required by the financing, and the firm has full use of the building for the duration of the lease, and can keep the building at the end. There is no meaningful economic difference between the purchase and the lease. However, if

the firm can avoid carrying the future obligations incurred by the lease as a liability, the debt-equity ratio will remain 0.5.

If investors, creditors, etc., are deceived by this manipulation, then the firm can lower its financing costs by hiding sources or risk. (Can lenders, analysts, etc. be tricked in this way?)

I.1.b. Debt Covenants

When a company issues debt, it often does so with covenants, which are binding agreements. For example, a covenant may prevent the issuance of additional debt, the payment of excessive dividends, etc. Failing to live up to the terms of a debt covenant constitutes a default. Off-balance sheet financing may allow a firm to take on additional debt without violating the covenants on existing debt.

There are generally two ways to achieve off-balance sheet financing.

I.1.c. Executory Contracts

Recall that executory contracts do not result in the creation of an asset or a liability. Clever structuring of executory contracts can have the effect of keeping debt of the balance sheet.

Example (from book) – two forest product companies need to build more pulp-processing capacity. If they borrow funds to build additional capacity, this will result in creation of an asset (the new/expanded plant) and a liability

(the debt issued to raise the funds). Instead, they form a joint venture to build a new plant, and each agree to use 50% of the additional capacity for 20 years. They also agree to pay 50% of all costs. The joint venture borrows money for construction, based on the binding commitments given by the two partners. The commitment to purchase 50% of capacity is considered an executory contract – no liability is recognized.

Is there any meaningful economic difference between this scenario and one where both firms simply borrow money to build the processing plant?

I.1.d. Contingent Obligations

A firm may sell an asset, and agree to make payments back to the purchaser under specified conditions.

Example (from Stickney/Weil) – A department store has large amount of money in accounts receivable. It could borrow money, using the A/R as collateral. Such a debt would show up on the balance sheet as a liability. Instead, it could sell A/R to a bank. The purchase price is less than the expected amount of cash collections, just as the amount of money borrowed would have been less than the amount repaid. The department store collects the A/R and remits them to the bank.

Is there any difference between this scheme and simply borrowing money, using A/R as collateral?

I.1.e. Rules on Off-Balance Sheet Financing

The FASB generally requires recognition of a liability when the party receiving financing is the one deriving economic benefits and bearing economic risk from the transaction.

Example (from Stickney/Weil) – an airline leases aircraft for the entire term of their useful lives; the terms of the lease do not allow cancellation. The airline is receiving the financing, and also receives the economic benefit (i.e., use of the aircraft) and bears the economic risk (i.e., has to make payments whether or not the aircraft is earning its keep). The lease commitment will generally be recognized as a liability.

Suppose instead that the airline leases the aircraft for only a short time, and the leasing company bears the risk of obsolescence of the aircraft, a decline in demand for air travel, etc. Then the balance sheet may not reflect the asset (use of the aircraft) or liability (obligation to make payments).

The FASB constantly struggles to kill off schemes for off-balance sheet financing, and companies constantly devise new schemes. Some accounting professionals take the view that this was will never end so long as executory contracts are not recognized.

I.2. Leases

How is leasing something different than purchasing it outright and financing the cost?

Both methods require periodic payments, and grant the purchaser/lessee the rights to use the asset.

Criteria we might use are:

(1) Can the lessee cancel the lease?

(2) Does the lessee keep the property at the end of the lease term?

(3) Does the lease cover a substantial portion of the asset's useful life?

Leases receive one of two possible accounting treatments.

I.2.a. Operating Lease

A lease the can be cancelled, and some that cannot, are considered operating leases. No asset or liability is created; the lease payments are considered expenses as they are incurred.

Beginning of lease – no accounting entry recorded.

Passage of time – expense is recognized as the lessee uses the asset, and accrues to a liability.

Payments – when lease payments are made, they reduce the liability incurred above.

Example – a firm leases a $700,000 machine for 10 years, making payments of $129,002.69 at the end of each of the ten years. If this lease qualifies as an operating lease, then no entry is made at inception. Each year, $129,002.69 in

expense is accrued and then paid. At the end of the 10 years, the machine is returned (or scrapped) and no further accounting entry is made.

I.2.b. Capital Lease

A lease that is not cancelable, and that meets certain other criteria, is a capital lease. When entering into a capital lease, an asset and liability are simultaneously created. The asset is called a leasehold, and represents the right to use whatever it is that is being leased. The liability is the obligation to make the future lease payments. In effect, the lease is treated as if it were a financed purchase.

Beginning of lease – simultaneous acquisition of asset and incurring of liability. The value of the asset and the liability are equal, so no immediate effect on net income.

Passage of time – as the lessee uses the asset, two things are needed. First, interest accrues on the liability. Second, the value of the asset is reduced, or amortized.

Payments – when lease payments are made, they reduce the liability.

Example – same facts as above, but treat the lease as a capital lease. Upon inception, we record a leasehold asset of $700,000, and a liability of $700,000. The IRR in this case is 13%, and the amortization of the liability is as follows:

	Starting Balance	Interest Expense	Payment	Reduction of Principal	Ending Balance
0					$700,000.00
1	$700,000.00	$91,000.00	$129,002.69	$38,002.69	$661,997.31
2	$661,997.31	$86,059.65	$129,002.69	$42,943.04	$619,054.27
3	$619,054.27	$80,477.06	$129,002.69	$48,525.63	$570,528.64
4	$570,528.64	$74,168.72	$129,002.69	$54,833.97	$515,694.67
5	$515,694.67	$67,040.31	$129,002.69	$61,962.38	$453,732.29
6	$453,732.29	$58,985.20	$129,002.69	$70,017.49	$383,714.80
7	$383,714.80	$49,882.92	$129,002.69	$79,119.77	$304,595.03
8	$304,595.03	$39,597.35	$129,002.69	$89,405.34	$215,189.69
9	$215,189.69	$27,974.66	$129,002.69	$101,028.03	$114,161.66
10	$114,161.66	$14,841.03	$129,002.69	$114,161.66	$0.00

So each year, we record interest expense in the amounts shown above. When payments are made, they reduce the value of the liability, eventually to zero.

We must also amortize the asset. By the straight-line method, the expense will be $70,000 per year. We can reduce the value of the asset each year, or instead establish a contra-asset account.

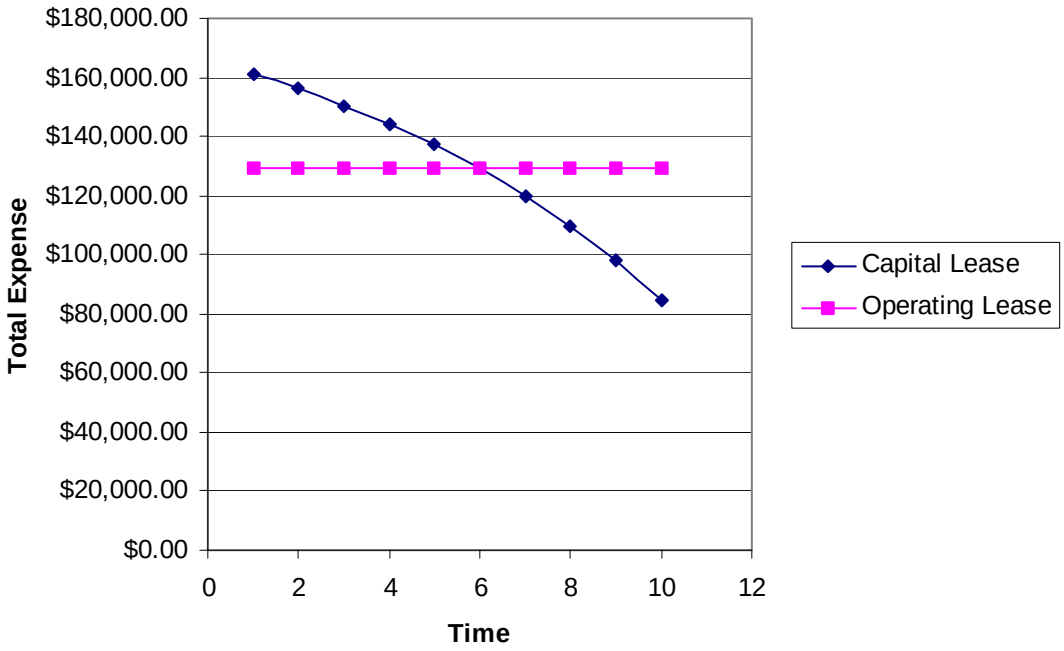
I.2.c. Total Expense Under Alternate Methods

Whether the lease is treated as a capital lease or an operating lease, all payments will eventually be treated as expense. However, the timing will be different.

Operating lease – lease payments are treated as period expenses

Capital lease – some lease payments are reduction in principal, not interest expense. However, the asset is amortized by the same amount.

Assuming straight line depreciation, capital leases result in faster recognition of expense.



I.2.d. Which Method?

Non-cancelable leases are capital leases when any of the four conditions are met:

(1) Lessee assumes ownership at the end of the lease

(2) Lessee has bargain purchase option

(3) Lease extends to 75% of asset life

(4) Present value of minimum lease payments is at least 90% of current value of asset

The fourth condition is the toughest one to evade.

I.2.e. Tax Implications

Recall that accelerated depreciation schedules are the norm for tax purposes. Accelerated depreciation does not change the amount of expense recognized, but does change the timing – a tax deduction now is better than a tax deduction years in the future.

However, tax deductions are worthless if there is no income for the deduction to reduce. What does a company do if it does not have sufficient income to take advantage of accelerated depreciation?

One technique is to lease equipment instead of buying it. If the lease qualifies as an operating lease, then it is the lessor, not the lessee, who retains ownership of the asset. If the lessor has sufficient net income to take advantage of accelerated depreciation, but the lessee does not, then it makes sense for the lessor to depreciate the asset. An operating lease allows this mutually beneficial arrangement; the lessor can share some of the benefit by lowering lease payments.

Rules for classifying capital and operating leases are different for tax purposes and financial accounting purposes.

I.3. Deferred Taxes

In some countries (e.g., Japan) the rules for financial accounting and tax accounting are very similar. In this case, we could simply apply the tax rate of the country in

question to income before taxes, and determine the amount of income taxes due.

In the US (and many other countries), the rules for financial accounting and tax accounting are often quite different. Consequently, there are differences between income reported to the shareholders and income reported to the taxing authorities:

Permanent differences – some revenues are exempt from taxation, and some expenses cannot be deducted form revenues when computing taxable income.

Temporary differences – financial accounting and tax accounting recognize the same total amount of revenue or expense, but do so in different accounting periods.

I.3.a. Recognizing Income Tax Expense

How much income tax expense should be recognized in a given accounting period? Should the amount be based on income for tax purposes, or for financial reporting purposes?

It seems clear that, when there are permanent differences in income for tax and financial reporting purposes, income tax expense should be based on income for tax purposes. However, what if there are temporary differences? Eventually, the difference will be reversed, so that the total amount of income for tax and financial reporting purposes will be the same.

The rule in the US (and in most other countries where the issue arises) is that, in the presence of temporary differences between taxable income and financial reporting income, tax should be based on the latter.

Example – a firm has income (before depreciation and income taxes) of $100,000. It records depreciation of $20,000 for financial reporting purposes (using straight line method), and $30,000 for tax purposes (using some accelerated depreciation method). The tax rate is 35%. Taxes payable are calculated based on the $30,000 figure:

$$TP = (\$100,000 - \$30,000) * 35\% = \$24,500$$

However, income tax expense is based on the $20,000 figure:

$$ITE = (\$100,000 - \$20,000) * 35\% = \$28,000$$

The remaining $3,500 is a deferred tax liability.

Income Tax Expense	$28,000	
Income Tax Payable		$24,500
Deferred Tax Liability		$3,500

Suppose that the next year, the situation is reversed. Income before depreciation and income taxes is once again $100,000, depreciation for financial reporting purposes is

$20,000, but this time, depreciation for tax purposes is only $10,000. Taxes payable are based on the $10,000 figure:

$$TP = (\$100,000 - \$10,000) * 35\% = \$31,500$$

Income tax expense is based on the $20,000 number:

$$ITE = (\$100,000 - \$20,000) * 35\% = \$28,000$$

Income Tax Expense	$28,000	
Deferred Tax Liability	$3,500	
Income Tax Payable		$31,500

In this example, income for financial reporting purposes was higher than for tax purposes, giving rise to a deferred tax liability. In cases where income for financial reporting purposes is lower than for tax purposes, we have deferred tax assets.

I.3.b. Criticism

The GAAP method of basing income tax expense on income for financial reporting purposes is not without critics.

First, valuation of deferred tax assets and liabilities does not take into account present value factors. For example, if differences between taxable and financial income result in a current reduction in taxes payable of $10,000, we record a deferred tax liability of $10,000, because eventually this temporary difference will be reversed. However, we may

not have to pay back the $10,000 for many years; in this case, should it really be recorded at $10,000?

Second, the income differences that result in deferred tax assets and liabilities may never be reversed. As companies grow, the income differences that gave rise to deferred tax assets are reversed, but new income differences arise to take their place. If a company keeps growing, it may have an ever-expanding quantity of deferred tax assets on the books, with no sign of reversal in sight. When the company does stop growing, this is often because there are problems – losses, restructuring charges, etc. In this case, the company may not have income against which the deferred tax asset can be applied. So the benefit of a deferred tax asset may never be realized at all.

I.3.c. Other Issues

Income tax rates might change, resulting in changes in the value of deferred tax assets and liabilities.

A firm might not realize the benefit of deferred tax assets if it has insufficient income. In this case, the firm must recognize a deferred tax asset valuation allowance (a contra-asset) that reduces the value of deferred tax assets.

I.3.d. Disclosure

Firms must report the following items in a footnote:

(1) Components of income before income taxes - shows domestic and foreign income.

(2) Components of income tax expense - shows domestic and foreign taxes payable, and shows amount of tax deferred.

(3) Reconciliation from statutory rates – shows items that result in an effective tax rate different than statutory tax rate. Examples include tax-exempt income, inter-company dividends, and tax rates in foreign countries that are different than the US rate.

(4) Components of deferred taxes and liabilities

I.3.e. Items Resulting in Deferred Tax Assets and Liabilities

A/R – for financial reporting purposes, firms must estimate and recognize as expense future uncollectible accounts. For tax purposes, uncollectible accounts are recognized as expense when they are deemed uncollectible.

Warranties – for financial reporting purposes, firms must estimate and recognize as expense future warranty expenses. For tax purposes, these are recognized as expense when incurred.

Depreciation – firms usually depreciate assets faster for tax purposes than for financial reporting purposes. Depreciation for tax purposes may also bring an assets value down below salvage value.

Inventory – if a firm uses LIFO for tax purposes, it must use LIFO for financial reporting purposes.

Installment sales – a firm recognizes revenue on installment sales when the sale is made for financial reporting purposes. For tax purposes, it recognizes the revenue when the cash is collected.

J. Marketable Securities and Investments

Marketable securities and investments are accounted for using several different methods, depending on the nature of the security, the amount held, the reason it is held, etc.

J.1. Types of Investments

For accounting purposes, financial investments are categorized along several dimensions.

J.1.a. Level of Influence/Control

A minority investment is one in which the investor owns less than 50% of the voting stock of a corporation; a majority investment is one in which the investor owns more than 50%. A passive investment is one in which the investor does not have significant influence or control over the management of the company; in an active investment, the investor does have such control. Majority investments are generally considered active, so there are three categories:

(1) Minority passive investments – an investor has acquired stock or other securities issued by a firm, but does not have sufficiently many shares to have influence over the management of that company. When an investor has less than 20% of the voting stock of a corporation, there is a presumption that the investment is minority passive. Such investments are accounted for with the market value method.

(2) Minority active investments – an investor has acquired stock of another firm, and does not own a controlling interest, but can exert influence on management of that company. An investment of between 20% and 50% of the voting stock of a corporation is presumed to be a minority active investment. Such investments are accounted for with the equity method.

(3) Majority active investments – an investor has a controlling interest in a company, i.e., more than 50% of the voting stock. Such investments are consolidated, i.e., the financial statements of the parent company and the subsidiary are presented together as if they were a single entity.

The criteria listed above are guidelines, and can be overridden when there is evidence that the classification is not appropriate.

J.1.b. Current/Non-current

Except for majority active investments, which are reported on a consolidate basis, securities appear on the balance sheet of the parent corporation. When (1) the securities can readily be converted into cash, and (2) the company intends to do so when it needs the cash, then the securities are classified as Marketable Securities, a current asset.

When one or both of these criteria are not met, the investment is classified as Investments in Securities, a non-current asset.

J.2. Market Value Method

The market value method is used for minority passive investments. Securities are divided into three categories:

(1) Debt held to maturity

(2) Trading securities

(3) Securities available for sale

The accounting treatment for the three types is different. There is also special treatment for derivatives securities that are treated as a hedge, but we will not discuss this treatment.

J.2.a. Debt held to maturity

A firm may have debt securities with both the ability and intent to hold them until maturity. Accounting for such securities is virtually identical to the accounting treatment we discussed under liabilities.

(1) Upon acquisition, debt held to maturity is recorded at acquisition cost.

(2) The IRR of the security is calculated.

(3) Each period, interest accrues at the IRR. This interest is recorded as income, whether or not it is actually paid.

(4) Coupon or other intermediate payments reduce the value of the security.

(5) If coupon payments exceed the amount of interest accrued, then the debt has a premium which is amortized over its lifetime.

(6) If coupon payments are less than the amount of interest accrued, then the debt has a discount which is amortized over its lifetime.

Example – a company purchases debt securities that make payments of $1,000 at the end of each of the next ten years, and an additional final payment of $10,000. The firm paid $10,000 for the securities.

The IRR in this case is 10%.

$$\$10{,}000 = \sum_{i=1}^{10} \frac{\$1{,}000}{(1+10\%)^{i}} + \frac{\$10{,}000}{(1+10\%)^{10}}$$

The amortization table is:

Year	Starting Balance	Interest	Payment	Change in Value	Ending Balance
0					$10,000
1	$10,000	$1,000	$1,000	$0	$10,000
2	$10,000	$1,000	$1,000	$0	$10,000
3	$10,000	$1,000	$1,000	$0	$10,000
4	$10,000	$1,000	$1,000	$0	$10,000
5	$10,000	$1,000	$1,000	$0	$10,000
6	$10,000	$1,000	$1,000	$0	$10,000
7	$10,000	$1,000	$1,000	$0	$10,000
8	$10,000	$1,000	$1,000	$0	$10,000
9	$10,000	$1,000	$1,000	$0	$10,000
10	$10,000	$1,000	$11,000	($10,000)	$0

Example – same facts, except that the company paid $10,642 for the debt securities. The IRR in this case is 9%:

$$\$10,642 = \sum_{i=1}^{10} \frac{\$1,000}{(1+9\%)^{i}} + \frac{\$10,000}{(1+9\%)^{10}}$$

The amortization table is:

Year	Starting Balance	Interest	Payment	Change in Value	Ending Balance
0					$10,642
1	$10,642	$958	$1,000	($42)	$10,600
2	$10,600	$954	$1,000	($46)	$10,554
3	$10,554	$950	$1,000	($50)	$10,504
4	$10,504	$945	$1,000	($55)	$10,449
5	$10,449	$940	$1,000	($60)	$10,389
6	$10,389	$935	$1,000	($65)	$10,324
7	$10,324	$929	$1,000	($71)	$10,253
8	$10,253	$923	$1,000	($77)	$10,176
9	$10,176	$916	$1,000	($84)	$10,092
10	$10,092	$908	$11,000	($10,092)	$0

Example – same facts, except that the company paid $7.913 for the debt securities. The IRR is 14%:

$$\$7,913 = \sum_{i=1}^{10} \frac{\$1,000}{(1+14\%)^{i}} + \frac{\$10,000}{(1+14\%)^{10}}$$

The amortization table is as follows:

Year	Starting Balance	Interest	Payment	Change in Value	Ending Balance
0					$7,913
1	$7,913	$1,108	$1,000	$108	$8,021
2	$8,021	$1,123	$1,000	$123	$8,144
3	$8,144	$1,140	$1,000	$140	$8,284
4	$8,284	$1,160	$1,000	$160	$8,444
5	$8,444	$1,182	$1,000	$182	$8,626
6	$8,626	$1,208	$1,000	$208	$8,834
7	$8,834	$1,237	$1,000	$237	$9,071
8	$9,071	$1,270	$1,000	$270	$9,341
9	$9,341	$1,308	$1,000	$308	$9,649
10	$9,649	$1,351	$11,000	($9,649)	$0

Accounting for debt held to maturity is therefore not that much different than accounting for long-term debt liabilities.

J.2.b. Trading Securities

Securities held for short-term profit potential are called trading securities, and appear under the Marketable Securities item in the current section of the balance sheet. Derivatives securities that are not hedges are classified as trading securities. Trading securities are usually held by financial firms, but other firms sometimes hold them as well. These securities are always valued at their current market value.

(1) On acquisition, trading securities are valued at cost. (Cost includes expenses such as brokerage fees.)

(2) Dividends or other payments are recorded as income.

(3) At the end of each accounting period, trading securities are marked to market. An increase (decrease) in market value is recorded with a debit (credit) to the Marketable Securities account, and a credit (debit) to an account such as Unrealized Holding Gain (or Loss) on Trading Securities. This amount is reported on the income statement.

(4) When the securities are sold, any difference between the book value (acquisition cost plus the effect of cumulative gains/losses) and the sales price is recorded as a Realized Gain (or Loss) on Sale of Trading Securities.

Trading securities are recorded at current market value rather than acquisition cost because a ready market for such securities provides an objective measure of value, and market value is thought to be a more accurate reflection of the true value of the securities than acquisition cost.

J.2.c. Securities Available for Sale

Securities accounted for under the market value method that are neither trading securities nor debt held to maturity are considered available for sale. Such securities may be recorded either as Marketable Securities (i.e., in the current section of the balance sheet) or as Investments in Securities (in the non-current section). Accounting for such securities is, too put it mildly, strange.

(1) On acquisition, available for sale securities are recorded at cost, which includes expenses such as brokerage fees.

(2) Dividends or other payments are recorded as income.

(3) At the end of each accounting period, available for sale securities are marked to market. An increase (decrease) in market value is recorded with a debit (credit) to the Marketable Securities or Investments in Securities account, and a credit (debit) to an account such as Unrealized Holding Gain on Securities Available for Sale. This amount is not reported on the income statement, but is maintained in a separate shareholders' equity account, and is a component of the gross illogical aberration known as comprehensive income.

(4) When the securities are sold, the difference between the sales price and the original acquisition cost is recorded as a Realized Gain on Sale of Securities Available for Sale, and included in net income. The accumulated unrealized holding gain is reversed at this point.

Note the difference in treatment of unrealized gains or losses between trading securities and available for sale securities. The balance sheet always reflects the current market value of the security. At some point, the gain/loss experienced by owning the security is reported on the income statement, and eventually becomes part of retained earnings. For trading securities, the gain/loss experienced each accounting period ends up in retained earnings in that period. For available for sale securities, the gain/loss is called comprehensive income until the security is sold; at

that point, the entire cumulative gain is moved to retained earnings. Until now, we have treated shareholders' equity as if it had only two components:

$$\text{Shareholders' Equity} = \begin{bmatrix} \text{Contributed Capital} \\ +\text{Retained Earnings} \end{bmatrix}$$

Any change in the value of an asset that is not offset by corresponding changes in other assets or liabilities must be reflected in shareholders' equity. Unrealized gains on securities (both trading and available for sale) are recognized on the balance sheet. For trading securities, the unrealized gain is recognized in retained earnings. (Where else would it go?) Recall that we do not record income and expenses directly in retained earnings, but rather in income and expense accounts whose balances get moved to retained earnings at the end of the accounting period.

For available for sale securities, we need a more complicated breakdown of shareholders' equity:

$$\text{Shareholders' Equity} = \begin{bmatrix} \text{Contributed Capital} \\ +\begin{pmatrix} \text{Accumulated} \\ \text{Comprehensive Income} \end{pmatrix} \\ +\text{Retained Earnings} \end{bmatrix}$$

Unrealized gains or losses from available for sale securities are not recorded in retained earnings, but rather in accumulated comprehensive income. When the security is sold, the entire cumulative gain/loss is recorded in retained

earnings, and the amount in accumulated comprehensive income is wiped out.

Example – A firm purchases a security for $50,000 in Year 1, and the security is classified as a Trading Security. At the end of Year 1, the market value of the security is $65,000. In Year 2, the firm sells the security for $55,000.

At purchase, the transaction recorded is:

Marketable Securities	$50,000	
Cash		$50,000

At the end of year 1, the gain is recorded as:

Marketable Securities	$15,000	
Unrealized Holding Gain on Trading Securities		$15,000

Note that this $15,000 will be included in net income. When the security is sold in year 2, we record:

Cash	$55,000	
Realized Loss on Sale of Trading Securities	$10,000	
Marketable Securities		$65,000

This $10,000 loss will also be included in net income.

Example – Same as above, but the security is classified as Marketable Securities Available for Sale.

At purchase, the transaction recorded is:

Marketable Securities	$50,000	
Cash		$50,000

At the end of year 1, the gain is recorded as:

Marketable Securities	$15,000	
Unrealized Holding Gain on Securities Available for Sale		$15,000

Note that this $15,000 will not be included in net income, but is part of shareholders' equity. When the security is sold in year 2, we record:

Cash	$55,000	
Unrealized Holding Gain on Securities Available for Sale	$15,000	
Realized Gain on Sale of Securities Available for Sale		$5,000
Marketable Securities		$65,000

(Note – this transaction may be recorded as two separate transactions, one at the time of sale, and the other as an adjusting entry at the end of the accounting period.)

J.2.d. Reclassification

Sometimes securities that were previous classified in one of the three categories (debt held to maturity, trading securities, or available for sale securities) is reclassified. FASB statement 115 describes how such a reclassification should be recorded.

J.2.e. Disclosures

Considerable additional information must be disclosed in the financial statements; typically there is a footnote describing the different securities, gross realized gains, gross realized losses, amortized cost of debt securities, etc.

J.2.f. Manipulation

Prior to 1993, securities were reported on a lower of cost or market basis, with a single balance sheet item for all securities. Firms therefore had considerable latitude in determining when to recognize income; gains were recognized on sale, so a firm could store up unrecognized gains in its portfolio of securities, and then recognize them in the years when net income needs a boost. The current treatment reduces the scope for such manipulation; in the case of available for sale securities, the appearance of gains/losses on the income statement can be timed, but not on the balance sheet.

J.3. Equity Method

Accounting for minority active investments uses the equity method. A firm that owns securities of another firm, and has some influence over the management of the other firm, has an opportunity to manipulate income by influencing whether profits are paid out as dividends or not. Dividends are recognized as net income. If instead earnings are retained, they would cause in increase in stock price, which would be reflected in comprehensive income for available for sale securities. The equity method prevents this sort of manipulation. Accounting under the equity method is as follows:

(1) The initial investment is recorded at acquisition cost.

(2) When the subsidiary company has earnings, the parent company records a share of those earnings (based on its percentage of ownership) as income. On the balance sheet, the value of the investment in the subsidiary is increased.

(3) Dividends are not treated as revenue, but rather as a reduction in the value of the investment in the subsidiary.

(4) Any excess of purchase price paid over the net book value of the assets and liabilities of the subsidiary firm is considered goodwill, and is amortized over a period not to exceed 40 years. (Note – in 2001, the FASB has decided to replace the amortization of goodwill with an impairment approach. Rather than

amortizing goodwill over a fixed time period, and test of impairment will be applied, and an expense recognized if the goodwill is determined to be impaired.)

(5) Sale of the security at a price different than book value results in a gain or loss.

Once goodwill is amortized (or impaired) down to zero, the carrying value of the investment is equal to book value of the parent's percentage ownership in the subsidiary.

Example – a firm pays $10 million to acquire 40% of the common stock of X Corp. at the beginning of X's fiscal year. The book value of X Corp. common stock is $15 million, and consists of 1 million shares. At the end of the first year, X Corp. reports net income of $3 million, declares a dividend of $1 per share, and pays the dividend. At the beginning of the next year, it sells its stake in X Corp. for $12 million.

Acquisition:

Investment in X Corp.	$10	
Cash		$10

To reflect net income earned by X Corp.:

Investment in X Corp.	$1.2	
Equity in Earnings Of Affiliate		$1.2

To reflect dividend payments:

Cash	$0.4	
Investment in X Corp.		$0.4

To reflect goodwill amortization:

Amortization Expense	$0.1	
Investment in X Corp.		$0.1

(Note – the above transaction would not occur under the new rules drafted in January of 2001. Instead the goodwill would have to be tested for impairment; an expense would only be recognized in the goodwill was determined to be impaired.)

To record the sale:

Cash	$12	
Investment in X Corp.		$10.7
Gain on Sale		$1.3

J.4. Consolidation

When a firm owns the majority of the voting stock of a subsidiary, the financial statements must be consolidated, unless there is significant evidence that the firm cannot exercise control over the subsidiary. If a firm does not

consolidate the statements of a majority owned subsidiary, this must be disclosed in the financial statements.

Consolidated statements include the assets, liabilities, revenues, expenses, etc. of the subsidiaries together on a single set of statements with the assets, liabilities, etc. of the parent.

Two complicating factors arise. First, there is a need to eliminate inter-company transactions on the joint financial statements. Second, if the subsidiary is less than 100% owned, the ownership interests of the minority owners must be accounted for somehow.

J.4.a. Intercompany Transactions

Each company (the parent and subsidiary) maintains its own accounting records; these records are then combined for financial accounting purposes at the end of each accounting period. Transactions between the two companies are recorded separately on the two sets of accounting records. For example, if the subsidiary sells goods to the parent (possibly at a profit), this sale will be reflected as a sale on the books of subsidiary, and a purchase on the books of the parent. If the parent company then sells the goods to an outside party, it will record revenue associated with the sale as well. So simply adding the revenue and expense accounts of the parent and subsidiary together will be misleading; revenues will show that the good was sold twice, when, treating the consolidate firm as a single economic entity, the good was only sold once.

Suppose the parent and subsidiary prepare separate statements, and the parent uses the equity method to account for its investment in the subsidiary. Then the following are examples of inter-company assets, liabilities, etc. that need to be eliminated:

Accounts receivable/payable – amounts payable by one of the companies to another are excluded from consolidated statements.

Investment in the subsidiary – under the equity method, the investment in the subsidiary is recorded at the net book value of the subsidiary's assets (plus goodwill that has not yet been amortized or impaired). So the subsidiary's books show its assets and liabilities, and the parent's books show the same assets and liabilities again (as investment in subsidiary). Similarly, shareholders' equity in the subsidiary includes the ownership interests of the parent company, which then also effectively records shareholders' equity of the subsidiary on its own books. Both of these need to be eliminated.

Inter-company sales – if the parent or subsidiary sell products or services to each other, the sales revenue and cost of goods sold arising from the transaction need to be eliminated.

J.4.b. Minority Interest

If a firm consolidates the statements of a subsidiary (because the investment in the subsidiary is classified as majority active), it may nonetheless own less than 100% of the stock of the subsidiary. In this case, simply listing the

assets and liabilities of the subsidiary together with lose of the parent overstates the parent's ownership interest; some of the net assets of the subsidiary belong to minority shareholders. Some of the net income of the subsidiary also belongs to the minority shareholders. This ownership of the net assets and right to the income stream must be accounted for somehow.

The ownership interests of minority shareholders in the net assets of the subsidiary is usually listed on the balance sheet as Minority Interest, between liabilities and shareholders' equity. The value of the minority interest is the shareholders' equity of the subsidiary, multiplied by the percentage of the subsidiary that is not owned by the parent.

Example – a subsidiary is 70% owned, and has assets of $200 million, liabilities of $50 million, and shareholders' equity of $150 million. Assuming no inter-company transactions need to be eliminated, the parent will show assets related to the subsidiary of $200 million, liabilities of $50 million, and a minority interest of $45 million.

Similarly, the claim of the minority interest to the net income of the subsidiary must appear in the income statement of the parent company.

J.5. Accounting for Acquisitions

When one company purchases another, there are two ways to account for the purchase: the purchase method and the pooling-of-interests method. The pooling-of-interests method is not permitted for business combinations initiated

after 30 June 2001, but nonetheless appears in many recent financial statements.

J.5.a. Purchase Method

Under the purchase method, the assets and liabilities of the subsidiary company appear on the balance sheet of the parent company at fair market value on the date of the acquisition.

If the value of cash or other consideration (e.g., stock of the parent company) exceeds the fair market value of the net assets of the subsidiary, the difference is goodwill, and appears on the balance sheet of the parent company. Prior to 2001, such goodwill would then be amortized over some period, typically 40 years. During 2001, FASB switched over to an impairment method for goodwill accounting; expense is recognized for goodwill only if it is deemed to be impaired.

If the value of cash or other consideration is exceeded by the market value of the tangible net assets of the subsidiary, then we have what is sometimes called negative goodwill. However, it isn't really goodwill, i.e., we do not record a negative goodwill asset or a positive goodwill liability. The net assets of the subsidiary are marked down on a pro-rata basis until the negative goodwill is eliminated. (Assets with readily ascertainable market value, such as investments in securities, do not get marked down.) If there is still negative goodwill remaining, an extraordinary gain is recorded on the income statement.

J.5.b. Pooling-of-Interests Method

This method treats the business combination as if it were a merger, not an acquisition of one company by another. Pooling transactions involve the exchange of stock of the two companies; holders of the stock of either company receive stock of the combined entity.

Under the pooling-of-interests method, the assets and liabilities of the two companies continue to be recorded at their book values after acquisition. That is, there is no mark-up to market value as there typically would be with purchase accounting. Furthermore, there is no cash exchanged, and therefore no goodwill to amortize.

Certain conditions must be satisfied to qualify for pooling-of-interests accounting.

J.5.c. Effects on Net Income

In the past, firms often liked to use pooling when possible. Net income is usually substantially higher under the pooling method. Under the purchase method, any excess of purchase price over the book value of assets acquired must be accounted for in one of two ways:

(1) The acquired assets are marked up to market value, which is often higher than book value.

(2) Anything left over is goodwill.

The goodwill (up until now) has been amortized, and therefore reduces net income. The increase in value of acquired assets often results in additional (future)

depreciation and amortization charges, so this also tends to reduce net income.

Under the pooling method, there is no mark up to market value and no goodwill to amortize, so that net income will be usually be higher than when purchasing accounting is used.

K. Shareholders' Equity

K.1. Transactions Affecting Shareholders' Equity

Recall that shareholders' equity can be divided into two main components: contributed capital and retained earnings. We have recently added a third component, accumulated comprehensive income. Transactions affecting shareholders' equity are therefore of two types:

(1) Capital transactions are generally infusions or disbursements of cash to shareholders. Examples include issuance of stock, repurchase of stock, and payment of dividends.

(2) Operating transactions arise from the conduct of the firms business. Examples include sales of goods exceeding cost of goods sold, sale of an asset for a price different than its book value, general and administrative expenses not directly linked to specific revenues, etc.

K.2. Operating Transactions

K.2.a. Net Income

Operating transactions (with some exceptions) appear on the income statement.

(1) Earnings from continuing operations – most of a firm's activities will fall into this category, which is

sometimes subdivided into operating income and non-operating income.

(2) Earnings, gains, and losses from discontinued operations – if a firm has disposed of a division, or plans to do so soon, earnings and other income/loss must be disclosed separately. These items are reported net of tax effects.

(3) Extraordinary gains and losses – items in this category must be both unusual and infrequent. Such items are reported net of tax effects.

(4) Adjustments for changes in accounting principles disclose the effects on current and sometimes previous years.

K.2.b. Comprehensive Income

Certain types of unrealized gains and losses are not included in net income. We have already seen one example.

(1) Unrealized gains and losses on securities available for sale.

(2) Unrealized gains and losses on derivative securities used as cash flow hedges.

(3) Foreign currency translations – change in value of assets/liabilities due to exchange rate changes.

(4) Some pension transactions.

Gains and losses from these sources are included in comprehensive income, a category of shareholders' equity that is separate from retained earnings. Such gains and losses must be disclosed in one of three ways:

(1) On income statement, below net income.

(2) In separate statement of comprehensive income.

(3) On statement of shareholders' equity

K.3. Types of Stock

Shareholders' Equity generally consists of the equity of common stockholders and preferred stockholders, although firms often issue complicated financial instruments that blur the distinction between the two, or between stock and debt.

K.3.a. Preferred Stock

Preferred stock generally earns dividends at a prespecified rate, and has cumulative dividend rights, i.e., all dividends due on preferred stock must be paid before any dividends on common stock can be paid. Preferred stock could be thought of as intermediate between common stock and debt.

Some preferred stock has special features, such as a call option (the issuing company can retire the stock at a specified price), or a conversion option (the holder of the preferred stock can exchange it for common stock). Such options can often only be exercised on certain dates.

Some preferred stock is redeemable, i.e., the issuer has the obligation to retire the stock at a specified time and price. There are special disclosure requirements for redeemable preferred stock, since it rather resembles debt.

K.3.b. Common Shareholders' Equity

All corporations issue common stock, which generally grants rights to all income not already allocated to other claimants (e.g., creditors and preferred stock holders) and voting rights.

When common stock is issued, the amount of cash received is often broken into two categories, par value and additional paid-in capital. The distinction does not have much economic meaning, but is nonetheless required by some jurisdictions.

In addition to the contributed capital, common shareholders' equity includes the cumulative net income of the firm, less the amount that has been paid out in dividends. This amount is retained earnings.

Accumulated Other Comprehensive Income includes the various types of gains or losses (already discussed) that are excluded from net income.

Treasury stock is common stock that a firm has acquired in market transactions. Such stock is effectively out of circulation, and does not earn dividends or carry voting rights.

K.4. Transactions Involving Issuance of Stock

Stock can be issued for cash, for other assets, in satisfaction of a debt, against options, rights, or warrants, or against convertible debt or preferred stock.

K.4.a. Issuance for Cash

Nothing to complicated here, just debit cash, credit common stock (i.e., par value) and Additional Paid-in Capital by the appropriate amounts.

Note that the amount credited to common stock (per share) should always be the same, but the amount of additional paid-in capital will vary over time.

K.4.b. Issuance for Non-Cash Assets

The main issue is determining the value of the stock issued and the assets received. If the market value of the assets can be determined, this is the value to use; if not, then the appropriate amount is the market value of the stock issued.

K.4.c. Issuance in Satisfaction of an Obligation

When stock is issued, for example, in place of wages, the appropriate expense account is debited directly.

K.4.d. Employee Stock Options

Employees sometimes receive stock options on a grant date, allowing them to purchase stock at a pre-specified exercise price. The date on which an employee exercises the option is the exercise date.

If, on the grant date, the market price of the company stock does not exceed the exercise price, then no accounting entry is recorded. When the option is exercised, cash is debited, and common stock and additional paid-in capital are credited.

K.4.e. Alternate Stock Option Treatment

Even if the exercise price is equal to or greater than the current market price of the stock, the options nonetheless have economic value, which is related to the volatility of the stock.

Firms are permitted (but not required) to recognize as expense the value of the options on the grant date; the amount of the expense is also recorded as a new type of shareholders' equity (e.g., Common Stock Options). The value of the options is determined by the Black-Scholes option pricing formula. When exercised, both the cash and common stock options are debited. If they expire, the value of the options is transferred to additional paid-in capital.

This treatment is not required; however, comparable information must be disclosed in footnotes.

K.4.f. Stock Rights

Stock rights are similar to options, but are granted to existing shareholders rather than employees. Furthermore, the rights are often transferable. No entry is made at time of issuance of the stock right, only when the right is exercised.

K.4.g. Stock Warrants

Stock warrants are similar to options, but are sold for cash. Since there is a transaction that validates the value of the warrants, they are recorded upon issuance at a value equal to the amount of cash received.

When exercised, both cash and Common Stock Warrants are debited, and Common Stock and Additional Paid-in Capital are credited.

If the warrants expire, their value is transferred to additional paid-in capital.

Sometimes warrants are issued with bonds; if the value of the bonds and warrants can be identified separately, the issuance is treated as two separate transactions. If not, then the full issue price is allocated to the bond.

K.5. Treasury Shares

Firms sometimes acquire their own stock. Stock that has been thus acquired is called treasury stock. No profit or loss is recognized on treasury stock transactions; the appropriate shareholders' equity accounts are debited or credited directly.

K.5.a. Acquisition of Treasury Stock

When a company purchases its own stock, it debits Treasury Stock and credits Cash.

K.5.b. Reissuance of Treasury Stock at Higher Price

When treasury stock is reissued at a higher price than its original acquisition cost, we debit cash, credit treasury stock, and credit the remaining amount to additional paid-in capital.

K.5.c. Reissuance of Treasury Stock at Lower Price

When treasury stock is reissued at a lower price than its original acquisition cost, we debit cash, credit treasury stock, and debit the remaining amount to additional paid-in capital. If the credit balance in additional paid-in capital is not sufficient to make up the difference, we reduce this account to zero, and debit the remaining amount to retained earnings.