Fair Value Accounting: Tools and Concepts

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Course Description

Fair values are more common in financial reports because fair values have increased in business importance in recent years. Increasingly elaborate financial instruments and risk management practices have created financial statement elements for which historical cost is almost irrelevant, and fair value, and fluctuations in fair value, are extremely relevant. This course is a comprehensive survey of fair value accounting with a discussion of :(1) ASC 820*, Fair Value Measurements and Disclosures*, (2) A list of the financial statement items for which fair value reporting is required or allowed. (3) A variety of valuation models, and (4) Fair value disclosure requirements business.

Field of Study	Accounting
Level of Knowledge	Basic to Intermediate
Prerequisite	Basic Math
Advanced Preparation	None

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Fair Value Accounting

Learning Objectives:

After completing this section, you should be able to:

1. Identify the appropriate circumstances for using fair values in financial reporting.
2. Recognize the objectives of using present values and the elements used in present value measurement to help determine fair value.
3. Recognize several valuation models used in determining fair value for different assets and liabilities.
4. Calculate the present value for different investments.

Fair values are more common in financial reports because fair values have increased in business importance in recent years. Increasingly elaborate financial instruments and risk management practices have created financial statement elements for which historical cost is almost irrelevant, and fair value, and fluctuations in fair value, are extremely relevant.

Fair Value Principle

Fair value is defined as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date." Fair value is therefore a market-based measure. [ASC 820-10, Fair Value Measurements and Disclosures: Overall (FAS-157, Fair Value Measurements)]. Recently GAAP has increasingly called for use of fair value measurements in the financial statements. This is often referred to as the fair value principle. Fair value information may be more useful than historical cost for certain types of assets and liabilities and in certain industries. For example, companies report many financial instruments, including derivatives, at fair value. Certain industries, such as brokerage houses and mutual funds, prepare their basic financial statements on a fair value basis.

At initial acquisition, historical cost equals fair value. In subsequent periods, as market and economic conditions change, historical cost and fair value often diverge. Thus, fair value measures or estimates often provide more relevant information about the expected future cash flows related to the asset or liability. For example, when long-lived assets decline in value, a fair value measure determines any impairment loss. The FASB's position is that fair value information is more relevant to users than historical cost. Fair value measurement provides better insight into the value of a company's asset and liabilities (its financial position) and a better basis for assessing future cash flow prospects.

Recently the FASB has taken the additional step of giving companies the option to use fair value (referred to as the fair value option) as the basis for measurement of financial assets and financial liabilities. [ASC 825-10-25, Financial Instruments: Overall (FAS-159, The Fair Value Option for Financial Assets and Financial Liabilities)]. It considers fair value more relevant than historical cost because it reflects the current cash equivalent value of financial instruments. As a result companies now have the option to record fair value in their accounts for most financial instruments, including such items as receivables, investments, and debt securities.

Use of fair value in financial reporting is increasingly common. However, measurement based on fair value introduces increased subjectivity into accounting reports, when fair value information is not readily available. To increase consistency and comparability in fair value measures, the FASB established a fair value hierarchy that provides insight into the priority of valuation techniques to use to determine fair value. As shown in Exhibit 1, the fair value hierarchy is divided into three broad levels.

Exhibit 1
Fair Value Hierarchy

Level 1: Quoted (unadjusted) prices in active markets for identical assets or liabilities. **Level 2:** Inputs other than quoted prices included in Level 1 that are observable for the asset or liability either directly or indirectly. **Level 3:** Unobservable inputs (for example, the reporting entity's assumptions).	Most Reliable ↕ Least Reliable

As seen in Exhibit 1, Level 1 is the most reliable because it is based on quoted prices, like a closing stock price in financial dailies and investment websites. Level 2 is the next most reliable and would rely on evaluating similar assets or liabilities in active markets. At the least-reliable level, Level 3, much judgment is needed based on the best in-formation available, to arrive at a relevant and reliable fair value measurement. For major groups of assets and liabilities, companies must disclose: (1) the fair value

measurement and (2) the fair value hierarchy level of the measurements as a whole, classified by Level 1, 2, or 3. Given the judgment involved, it follows that the more a company depends on Level 3 to determine fair values, the more information about the valuation process the company will need to disclose. Thus, additional disclosures are required for Level 3 measurements. These disclosures will be covered in more detail in a later section.

It is easy to arrive at fair values when markets are liquid with many traders, but fair value answers are not readily available in other situations. The FASB provides guidance on estimating fair values when market-related data is not available. In general, these valuation issues relate to Level 3 fair value measurements. These measurements may be developed using expected cash flow and present value techniques, as described in Statement of Financial Accounting Concepts (SFAC) No. 7, Using Cash Flow Information and Present Value in Accounting, (to be discussed in the next section).

As indicated above, we presently have a "mixed-attribute" system that permits the use of historical cost and fair value. Although the historical cost principle continues to be an important basis for valuation, recording and reporting of fair value information is increasing. The recent measurement and disclosure guidance should increase consistency and comparability when fair value measurements are used in the financial statements and related notes.

Using Cash Flow Information and Present Value in Accounting (SFAC No. 7)

Accounting measurements ordinarily use an observable amount determined by market forces. In the absence of such an amount, estimated cash flows often serve as a measure of an asset or a liability. Thus, SFAC 7 establishes a framework that uses cash flows for

1. Measurements at initial recognition,
2. Fresh-start measurements, and
3. Applications of the interest method of allocation.

SFAC 7 also states principles for the use of present value, especially when the amounts of future cash flows or their timing are uncertain, and describes the objective of present value.

1. An estimated cash flow is a future amount, whether paid or received.
2. A fresh-start measurement occurs in a period subsequent to initial recognition. It results in a carrying amount not based on prior amounts or accounting treatments. An example is the reporting of trading securities at fair value at each balance sheet date.
3. An interest method of allocation uses present value in the absence of a fresh-start measurement to calculate the periodic change in the carrying amount of an asset or liability.
4. Present value is a current measure of an estimated cash flow after discounting.

Present Value Measurement

The objective is to estimate fair value by distinguishing the economic differences between sets of future cash flows that may vary in amount, timing, and uncertainty. For example, a series of $1,000 payments due at the end of each of the next 7 years has the same undiscounted amount as a single $7,000 payment due in 7 years.For initial recognition and fresh-start purposes, present value is based on an observable attribute. In the absence of observed transaction prices, present value should encompass the elements of a market price if one existed (fair value). Thus, the only objective of present value for initial recognition and fresh-start purposes is to estimate fair value. Present value should reflect uncertainty so that variations in risks are incorporated. Exhibit 2 lists key elements of a present value measurement.

Exhibit 2
Elements of a PV Measurement

1. Estimates of future cash flows
2. Expected variability of their amount and timing
3. The price of uncertainty inherent in an asset or liability
4. Other factors, such as lack of liquidity or market imperfections
5. The time value of money based on the risk-free interest rate

The traditional approach. It is to calculating present value uses one set of estimated cash flows and one interest rate. Uncertainty is reflected solely in the choice of an interest rate. This approach is expected to continue to be used in many cases, for example, when contractual cash flows are involved.

The expected cash flow approach. This approach is applicable in more complex circumstances, such as when no market or no comparable item exists for an asset or liability.

1. The expected cash flow results from multiplying each possible estimated amount by its probability and adding the products.
2. The expected cash flow approach emphasizes explicit assumptions about the possible estimated cash flows and their probabilities.
3. By allowing for a range of possibilities, the expected cash flow approach permits the use of expected present value when the timing of cash flows is uncertain.

Expected present value is the sum of present values of estimated cash flows discounted using the same interest rate and weighted according to their probabilities.

Liabilities

The purpose of a present value measurement of the fair value of a liability is to estimate the assets required currently to (a) settle it or (b) transfer it to an entity of comparable credit standing. Measurement of certain liabilities, for example, bonds payable, involves the same process as that used

for assets. The measure of such a liability is the price at which another entity is willing to hold it as an asset.

Some liabilities, however, are not typically held as salable assets by another entity, for example, liabilities for warranties or environmental cleanup. In this case, the estimate of the liability would be the estimate of the price a third person would have to be paid to assume the liability. Credit standing is always incorporated into initial and fresh-start measurements of liabilities.

Interest Methods

Present value is a feature of these methods. A typical example is amortization of the discount or premium on bonds. Unlike a fresh-start measurement, an accounting allocation does not attempt to reflect all factors that cause change in an asset or liability. Because no allocation method, whether or not interest-based, is preferable in every situation, the FASB will choose whether to require an interest method of allocation on a project-by-project basis.

An interest method is most likely to be used when

- The transaction is a borrowing and a lending.
- Similar assets or liabilities are allocated using an interest method.
- The asset or liability has closely related estimated cash flows.
- The initial measurement was at present value.

Changes in estimated cash flows may result in a fresh-start measurement or in a change in the plan of amortization. If remeasurement is not done, a change in the scheme may be effected by

a) Prospectively determining a new effective rate given the carrying amount and the remaining cash flows.
b) Retrospectively determining a new effective rate given the original carrying amount, actual cash flows, and the newly estimated cash flows and using it to adjust the current carrying amount.
c) Using a catch-up approach to adjust the carrying amount to the present value of the remaining cash flows discounted at the original rate (the FASB's preferred method).

Fair Value Measurements

ASC 820-10, *Fair Value Measurements and Disclosures: Overall* (FAS-157, *Fair Value Measurements*), establishes a framework for fair value measurements required by other pronouncements. But it does not determine when fair value measurements are required. Accordingly, ASC 820 (FAS-157)

1. Defines fair value,
2. Discusses valuation techniques,
3. Establishes a fair value hierarchy of inputs to valuation techniques, and
4. Requires expanded disclosures about fair value measurements.

Entry price is the price paid to acquire an asset or received to assume a liability in an exchange transaction. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date [ASC 820-10 (FAS-157)]. This is sometimes referred to as exit value. It is a market-based measurement. A fair value measurement reflects current market participant assumptions regarding future inflows of the asset and future outflows of the liability. A fair value measurement should take into account features of the specific asset or liability such as condition and location. In ASC 820-10, the FASB explains the key concepts associated with valuation. With the increasing use of fair values in financial reporting, you should understand the key concepts used in defining and estimating fair values. These key concepts are as follows:

- The hypothetical transaction
- The principal (or most advantageous) market
- Market participants
- Highest and best use
- Valuation techniques
- Inputs to valuation techniques

The Hypothetical Transaction

Fair value is based on the price that would be received to sell an asset (or paid to transfer a liability) in a hypothetical transaction on the date of the measurement. This hypothetical transaction is assumed to be an orderly one meaning that it is not a forced or hasty sale. In addition, this hypothetical transaction is assumed to occur between two unrelated, informed market participants. Thus, as a company seeks to determine the fair value of an asset it holds, it does not focus on the price it could receive in selling the asset. Instead, the company must determine what price would be acceptable to a seller without that particular company's special skills or unique handicaps.

The Principal (or Most Advantageous) Market

The hypothetical transaction is an orderly market transaction. The principal market has the greatest volume or level of activity for the asset in question. For example, if the asset in question is a share of IBM stock, then the principal market is the New York Stock Exchange (NYSE), and the relevant price in determining the fair value of the share of stock is the price at which a shareholder could sell the share in the NYSE on the measurement date. Similarly, the principal market for trading pork belly futures is the Chicago Mercantile Exchange (CME). In the absence of such a market, then the fair value should be determined using the price that could be obtained in the most advantageous market of those available.

Market Participants

The price of the hypothetical transaction used to determine the fair value of an asset is the price that would occur between two unrelated, informed market participants. They are independent of the reporting entity. They also are knowledgeable in the sense that they have a reasonable understanding based on all available information, including that obtainable from customary due diligence efforts. Further, they are willing and able to engage in transactions involving the asset or liability. Market participants do not include parties who engage in forced or liquidation sales or are otherwise compelled to act. Market participants need not be specifically identified. Instead, the entity must identify their general characteristics, with consideration of factors specific to (1) the asset or liability, (2) the market, and (3) parties with whom the entity would deal. Thus, it is based on pricing assumptions of hypothetical market participant.

Example

None of us have much knowledge of pork belly futures, so any price that we might agree to would not be appropriate to use in determining the fair value of a pork belly future because we are not knowledgeable, we probably don't have the necessary financial resources, and we are also probably not interested in buying or selling pork belly futures.

Highest and Best Use

A key assumption in appraising an asset is that in an unconstrained market with ample time given for market participants to consider whether they want to buy an asset, the asset will be sold to the market participant who will use that asset in the most valuable way and who will pay the highest price for the asset. The fair value measurement is based on *the highest and best use* by market participants. This use maximizes the value of the asset. The highest and best use is *in-use* if the value-maximizing use is in combination with other assets in a group. An example is machinery in a factory. The highest and best use is *in-exchange* if the value-maximizing use is as a stand-alone asset. An example is a financial asset.

Valuation Techniques

In measuring fair value, valuation techniques in conformity with the market, income, and cost approaches should be used.

1. Under the *market approach*, prices for market transactions for identical or comparable assets or liabilities are used. For example, valuation techniques consistent with the market approach often use *market multiples* derived from a set of comparables. Multiples might lie in ranges with a different multiple for each comparable. The selection of where within the range the appropriate multiple falls requires judgment, considering factors specific to the measurement (qualitative and quantitative). Another example of a market approach is *matrix pricing.* This is a mathematical method used primarily to value debt securities without solely relying on quoted prices for the particular securities. This method relies on the relationship of the securities to other benchmark quoted securities.

2. Under the *income approach*, valuation techniques are used to convert future amounts (e.g., profits, cash flows) to a present value amount. For example, future cash flows are discounted to their present value amount using the present value tables. The measurement is based on market expectations of the future amounts. Those valuation techniques include present value techniques; option-pricing models, such as the Black-Scholes-Merton formula (a closed-form model) and a binomial model (a lattice model), which incorporate present value techniques; and the multiperiod excess earnings method, which is used to measure the fair value of certain intangible assets (goodwill).

3. The *cost approach* is based on the amount that currently would be required to replace the service capacity of an asset (often referred to as *current replacement cost*). From the perspective of a market participant (seller), the price that would be received for the asset is determined based on the cost to a market participant (buyer) to acquire or construct a substitute asset of comparable utility, adjusted for obsolescence. Obsolescence encompasses physical deterioration, functional (technological) obsolescence, and economic (external) obsolescence and is broader than depreciation for financial reporting purposes (an allocation of historical cost) or tax purposes (based on specified service lives).

These tools are illustrated later in the course. Note that depending on the circumstances, a single or multiple valuation technique may be needed. For example, a single valuation method would be used to value an asset using quoted prices in an active market for identical assets, whereas a multiple valuation method would be used to value a reporting unit. Input availability and reliability associated with the asset or liability may influence the selection of the best-suited valuation method.

Fair Value Hierarchy

The fair value hierarchy prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. The levels range from the highest priority, which is assigned to quoted prices

(unadjusted) in active markets for identical assets or liabilities (Level 1), to the lowest priority, which is assigned to unobservable inputs (Level 3).

Level 2 inputs are those (except quoted prices included within Level 1) that are observable for the asset or liability, either directly or indirectly. If the asset or liability has a specified (contractual) term, a Level 2 input must be observable for substantially the full term of the asset or liability. Included as Level 2 inputs are:

- Quoted prices for similar assets or liabilities in active markets.
- Quoted prices for similar or identical assets or liabilities in markets that are not active namely in markets having few transactions, noncurrent prices, price quotations that vary significantly, or very limited public information.
- Inputs excluding quoted prices that are observable for the asset or liability. Examples are interest rates observable at often quoted intervals, default rates, credit risks, loss severities, volatilities, and prepayment speeds.
- Inputs derived in most part from observable market data by correlation or other means.

Adjustments to Level 2 inputs vary depending on factors specific to the asset or liability. Those factors include the location or condition of the asset or liability, market volume and activity level, and the extent to which the inputs relate to comparable items to the asset or liability. A major adjustment to the fair value measurement may result in a Level 3 measurement.

Level 3 inputs are unobservable for the asset or liability. Unobservable inputs are used to measure fair value to the extent that observable inputs are unavailable. This allows for cases in which there is little or no market activity for the asset or liability at the measurement date. Unobservable inputs reflect the reporting entity's own assumptions about the assumptions (e.g., risk) that market participants would use in pricing the asset or liability.

If an input used to measure fair value is based on bid and ask prices, the price within the bid-ask spread that is most representative of fair value shall be used to measure fair value regardless of where in the fair value hierarchy the input falls.

Fair Value Disclosures

Disclosures are mandated for fair value measurements to improve financial statement user understanding. Quantitative disclosures using a tabular format are required in all periods (annual and interim). Qualitative (narrative) disclosures are required about the valuation methods used to measure fair value. Disclosures of fair value in measuring assets and liabilities emphasizes the inputs used to measure fair value and the impact of fair value measurements on profit or change in net assets.

For assets and liabilities measured at fair value on a recurring basis in periods after initial recognition (e.g., trading securities), disclosures should be made to allow financial statement users to appraise the

inputs used to formulate fair value measurements. To achieve this, the following should be disclosed in annual and interim periods for each major category of asset and liability:

1. Fair value measurements at the reporting date.
2. The level within the fair value hierarchy in which the fair value measurements in their entirety fall, segregating the fair value measurements using quoted prices in active markets for identical assets or liabilities (Level 1), major other observable inputs (Level 2), and significant unobservable inputs (Level 3).
3. For fair value measurements using major unobservable inputs (Level 3), a reconciliation of the beginning and ending balances, separately presenting changes during the period attributable to the following:
    a. Total gain or loss (realized and unrealized), segregating those gains or losses included in earnings (or changes in net assets) as well as where those gains or losses are presented in the financial statements.
    b. Purchases, sales, issuances, and settlements (net).
    c. Transfers in or out of Level 3. An example is a transfer because of a change in the observability of major inputs.
4. For annual reporting only, the valuation techniques used to measure fair value and a discussion of any changes in those techniques.

For assets and liabilities that are measured at fair value on a nonrecurring basis in periods after initial recognition such as impaired assets, disclosure should be made of:

1. The level within the fair value hierarchy in which the fair value measurements fall.
2. Fair value measurements recorded during the period and the reasons for those measurements.
3. For fair value measurements using significant unobservable inputs (Level 3), a description of the inputs and the data used to develop them.
4. For annual reporting only, the valuation methods used and any changes in them to measure similar assets and liabilities in prior years.

FAS 157-4, *Determining Fair Value When the Volume and Level of Activity for the Asset or Liability Have Significantly Decreased and Identifying Transactions That Are Not Orderly*, provides guidance for estimating fair value in accordance with ASC 820-10 (FAS-157), when the volume and activity level for the asset or liability have significantly decreased. This statement includes guidance on identifying circumstances that indicate a transaction is not orderly. If the reporting entity decides there has been a major decrease in the volume and level of activity for the asset or liability relative to normal market activity for the asset or liability, transactions or quoted prices may not be determinative of fair value. Further analysis is needed, and a significant adjustment to the transaction or quoted prices may be necessary to estimate fair value. Significant adjustments also may be needed in other situations (for instance, when a price for a similar asset requires significant adjustment to make it more comparable to the asset being measured or when the price is old).

Even in cases where there has been a significant decrease in the volume and level of activity, the objective of a fair value measurement remains the same. Determining the price at which willing market participants would transact at the measurement date under current market conditions depends on the facts and circumstances and requires the use of judgment. However, a reporting entity's intention to hold the asset or liability is not relevant in estimating fair value. Fair value is a market-based measurement, not an entity-specific measurement.

Even with a significant decrease in the volume and level of activity for the asset or liability, it is not appropriate to conclude that all transactions are not orderly (that is, distressed or forced).

Review Questions – Section 1

1. The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date is which of the following?

A. Cost.
B. Entry price.
C. Fair value.
D. Cost plus transaction fees.

2. According to SFAC 7, Using Cash Flow Information and Present Value in Accounting Measurements, the objective of present value when used to determine an accounting measurement for initial recognition purposes is to

A. Estimate fair value.
B. Capture the value of an asset or liability in the context of a given entity.
C. Calculate the effective-settlement amount of assets.
D. Estimate value in use.

3. According to ASC 820-10, Fair Value Measurements and Disclosures: Overall (FAS-157, Fair Value Measurements), fair value is

A. An entry price.
B. Based on an actual transaction.
C. An exit price.
D. An entity-specific measurement.

4. For the purpose of a fair value measurement of an asset or liability, a transaction is assumed to occur in the

A. Most advantageous market.
B. Principal market if one exists.
C. Market in which the result is optimized.
D. Principal market or most advantageous market at the election of the reporting entity.

5. In the absence of quoted prices for identical or similar assets or liabilities, fair value may NOT be estimated using which of the following valuation techniques?

A. Market approach.
B. Entry approach.
C. Income approach.
D. Cost approach.

6. Valuation techniques for fair value measurement must use

A. The market approach or income approach but not the cost approach.
B. Only observable inputs.
C. Current replacement cost to approximate fair value.
D. The pricing assumptions of market participants.

7. Fair value measurement of an asset or liability is based on a fair value hierarchy that establishes priorities among inputs to valuation techniques. According to the hierarchy,

A. Unadjusted quoted prices for an identical asset or liability are on Level 1.
B. Observable inputs are on Level 1.
C. Unobservable inputs are on Level 2.
D. Quoted prices for items similar to the asset or liability are on Level 3.

8. Fair value measurements of assets and liabilities are based on transactions between market participants at the measurement date. Market participants

A. Must be specifically identified.
B. Are willing and able to engage in transactions involving the asset or liability.
C. May be related parties if they are knowledgeable about the asset or liability.
D. Include parties who are forced to engage in the transactions if they are independent of the entity.

9. The fair value measurement of an asset

A. Reflects the highest and best use by market participants.
B. Assumes transfer, not a settlement.
C. Is based on the expected use by the reporting entity.
D. Includes the entity's own credit risk.

10. In the hierarchy for fair valuation process, which of the following levels would be observable market inputs other than quoted prices for identical assets or liabilities?

A. Level 1.
B. Level 2.
C. Level 3.
D. Level 4.

Fair Value Option for Financial Assets and Financial Liabilities

ASC 825-10-25, *Financial Instruments: Overall* (FAS-159, *The Fair Value Option for Financial Assets and Financial Liabilities*), allows companies to measure many financial instruments and some other items at fair value. Most provisions of the pronouncement solely apply to businesses that choose the fair value option.

Allowed Items

The eligible items for the fair value measurement option are:

1. Recognized financial assets and financial liabilities.
2. Nonfinancial insurance contracts and warranties that can be settled by the insurer by paying a third party for goods or services.
3. Firm commitments applying to financial instruments such as a forward purchase contract for a loan not readily convertible to cash. A firm commitment that would otherwise not be recognized at inception and that involves only financial instruments is *eligible* for fair value valuation. A firm commitment is an agreement with an unrelated party, binding on both parties and usually legally enforceable, with two characteristics:
    a. The agreement specifies all significant terms, including the quantity to be exchanged, a fixed price, and the timing of the transaction. The fixed price may be expressed as a specified amount of an entity's functional currency or of a foreign currency. It may also be expressed as a specified interest rate or specified effective yield.
    b. The agreement includes a disincentive for nonperformance that is sufficiently large to make performance probable.
4. Written loan commitment (i.e., a note payable such as a mortgage or credit line note). The option may be used whether the notes are discounted or not.
5. Host financial instruments arising from separating an embedded nonfinancial derivative instrument from a nonfinancial hybrid instrument.

Disallowed Items

The fair value option is *not* allowed for the following financial assets and liabilities:

1. Investments in a subsidiary that the entity is required to consolidate.
2. An interest in a variable interest entity that the entity is required to consolidate.
3. Employers' and plans' obligations (or assets from net overfunded positions) for pension benefits, other postretirement benefits, postemployment benefits, employee stock option and stock purchase plans, and other forms of deferred compensation arrangements.
4. Most financial assets and liabilities under lease contracts.
5. Deposit liabilities, withdrawable on demand, of banks, savings and loan associations, credit unions, and other similar depository institutions.

6. Financial instruments that are, in whole or in part, classified by the issuer as a component of shareholders' equity (including temporary equity), such as a convertible debt security with a noncontingent beneficial conversion feature.

ASC 825-10-25 (FAS-159) permits a company to choose to measure eligible items at fair value at stipulated election dates. A business measures at fair value the eligible items for which the fair value option election was made at a specified election date. The unrealized gains and losses on those items are reported in earnings at each subsequent reporting date. The fair value option is irrevocable (except if a new election date occurs) and is applied solely to entire instruments (not portions of those instruments or specified risks or specific cash flows). For example, an election date occurs when an entity recognizes an investment in equity securities with readily determinable fair values issued by another entity. A second election date occurs when the accounting changes because the investment later becomes subject to equity-method accounting. An original decision to classify the equity securities as available-for-sale may then be revoked at the second election date by choosing the fair value option, instead of the equity method.

In most cases, the fair value option may be applied instrument-by-instrument including investments otherwise accounted for under the equity method. There is no requirement that the fair value option be applied to all instruments issued or acquired in a single transaction except for multiple advances and investments accounted for under the equity method.

FAS-159's amendment to ASC 825-10-15, 4-4 (FAS-115, *Accounting for Certain Investments in Debt and Equity Securities,* applies to all companies with trading and available-for-sale securities. Upfront costs and fees applicable to items for which the fair value option is selected are expensed as incurred.

Electing the Fair Value Option and Election Dates

Companies have the option to report most financial instruments at fair value, with all gains and losses related to changes in fair value reported in the income statement. This option is applied on an instrument-by-instrument basis. The fair value option is generally available only at the time a company first purchases the financial asset or incurs a financial liability. If a company chooses to use the fair value option, it must measure this instrument at fair value until the company no longer has ownership.

In addition to the implementation date, an entity may choose to elect the fair value option for an eligible item only on the election date, which is the date on which one of the following occurs:

1. The company first recognizes the eligible item. This is actually the preferable time to make the option, so that the asset or liability is consistently reported from its inception.
2. The company engages in an eligible firm commitment. At this point, the entity is considered to have rights to and therefore control of the asset or liability and may record the transaction for reporting purposes.

3. There is a change in the accounting treatment for an investment in another company because the investment becomes subject to the equity method or the investor no longer consolidates a subsidiary or variable interest entity but retains an interest.
4. Specialized accounting treatment no longer applies for the financial assets that have been reported at fair value such as under an AICPA Audit and Accounting Guide.
5. An event mandates an eligible item to be measured at fair value on the event date but does not require fair value measurement at each subsequent reporting date.
6. An election date occurs when an event requires an eligible item to be measured at fair value at the time of the event but not subsequently. However, an exception to this rule is recognition of impairment for a nontemporary impairment. Another situation in which no election date occurs is recognition of impairment when writing down inventory to the lower of cost or market.

Events

An election date for the fair value option includes the date of an event requiring fair value measurement when it occurs but not subsequently (excluding recognition of impairment, e.g., of inventory or long-lived assets). Examples of events requiring either remeasurement at fair value or initial recognition of eligible items and that result in an election date are (1) a business combination, (2) sale of a portion of a consolidated subsidiary; any previously recorded noncontrolling interest must be measured at fair value, or (3) a significant modification of debt. A consolidation requires an initial recognition in the consolidated statements of eligible items on the books of the subsidiary but not measurement of those items at fair value. A business combination involves an initial recognition of the assets acquired and liabilities assumed, with measurement at fair value. However, an investment in a subsidiary required to be consolidated is not itself an item eligible for the fair value option.

Instrument Application

The fair value option may be selected for a single eligible item without electing it for other identical items except for the following:

1. If the fair value option is selected for an eligible insurance contract, it must be applied to all claims and obligations under the contract.
2. If the fair value option is selected for an investment under the equity method, it must be applied to all of the investor's financial interests in the same entity that are eligible items.
3. If multiple advances are made to one borrower under a single contract (e.g., construction loan) and the individual advances lose their identity and become part of the larger loan, the fair value option must be applied to the larger loan balance but not to the individual advances.
4. If the fair value option is selected for an insurance contract for which integrated or nonintegrated contract features or riders are issued at the same time or later, the fair value option must be applied also to those features or coverage.

The fair value option does not usually have to be applied to all financial instruments issued or bought in a single transaction. For example, an investor in stock or bonds may apply the fair value option to some of the stock shares or bonds issued or acquired in a single transaction. In this case, an individual bond is considered the minimum denomination of that debt security. A financial instrument that is a single contract cannot be broken down into parts when using the fair value option. However, a loan syndication may consist of in multiple loans to the same debtor by different creditors. Each of the loans is a separate instrument, and the fair value option may be selected for some of the loans but not others.

An investor in an equity security may choose the fair value option for its entire investment in that security including any fractional shares.

Balance Sheet

GAAP does not allow for the netting on the balance sheet. Companies must report assets and liabilities measured at the fair value option in a way that separates those reported fair values from the book (carrying) values of similar assets and liabilities measured with a different measurement attribute. To achieve this, a company must either:

- *Option 1:* Report two separate line items to display the fair value and nonfair value carrying amounts.
- *Option 2*: Report the aggregate fair value and nonfinancial fair value amounts in the same line items in the balance sheet and, in parenthesis, disclose the amount measured at fair value included in the aggregate amount.

Example

Option 1:

Long-term debt:	
At fair value	80
At carrying value	30

Option 2:

Long-term debt ($80 at fair value)	110

The fair value option does not limit the presentation of an asset or liability to the long-term section of the balance sheet. Most entities will have both long- and short-term items that are measured at fair value.

Income Statement

Unrealized gains and losses on items measured using the fair value option are recognized at subsequent reporting dates. Upfront costs and fees related to those items are recognized as incurred. Although the FASB does not address where the unrealized gain or loss should be presented on the income-statement, the most appropriate location is in the other income (expense) section of the income statement.

Statement of Cash Flows

Companies must classify cash receipts and cash payments for items measured at fair value based on their nature and purpose.

Review Questions – Section 2

11. A commercial entity should record unrealized gains and losses as a result of reporting at fair value at each reporting date:

A. In equity.
B. In long-term liabilities.
C. In earnings.
D. In the mezzanine section.

12. The reporting entity may elect the fair value option for

A. An investment consisting of more than 50% of the outstanding voting interests of another entity.
B. An interest in a variable interest entity if the reporting entity is the primary beneficiary.
C. Most financial assets and liabilities.
D. Its obligation for pension and other postretirement employee benefits.

13. According to ASC 825-10-25, Financial Instruments: Overall (FAS-159, The Fair Value Option for Financial Assets and Financial Liabilities), election of the fair value option

A. Permits only for-profit entities to measure eligible items at fair value.
B. Requires deferral of related upfront costs.
C. Results in recognition of unrealized gains and losses in earnings of a business entity.
D. Results in recognition of unrealized gains and losses in other comprehensive income of a business entity.

14. The decision whether to elect the fair value option

A. May be applied to a portion of a financial instrument.
B. Is irrevocable until the next election date, if any.
C. Must be applied only to classes of financial instruments.
D. Must be applied to all instruments issued in a single transaction.

15. An entity may elect the fair value option for an event requiring (1) initial recognition of eligible items or (2) measurement of an eligible item at fair value when the event occurs but not at subsequent reporting dates. Such events include:

A. A Consolidation of a Subsidiary, but not a Business Combination
B. A Business Combination, but not a Consolidation of a Subsidiary
C. Both a Consolidation of a Subsidiary and a Business Combination
D. Neither a Consolidation of a Subsidiary nor a Business Combination

16. The fair value option is NOT allowed for which of the following financial assets and liabilities?

A. A firm commitment that would otherwise not be recognized at inception and that involves only financial instruments.
B. A forward purchase contract for a loan that is not readily convertible to cash.
C. A written loan commitment.
D. Employers' and plans' obligations.

17. Which of the following is an election date for the purpose of determining whether to elect the fair value option?

A. The accounting treatment of an equity investment changes because it is no longer subject to equity-method accounting.
B. The accounting for an equity investment changes because the entity no longer consolidates a subsidiary.
C. The entity enters into a firm commitment to purchase potbellies in six months.
D. The entity recognizes an other than temporary impairment of long-lived assets.

18. Bing Company has three mortgage notes payable. Which of the following is correct as it relates to Bing's ability to use the fair value option?

A. Bing must use the option for all three notes payable.
B. Bing may not use the option for any of the three notes payable.
C. Bing may choose to use the option for all three notes payable.
D. Bing may only use the option if all three notes payable specify discounted rates.

19. Which of the following is NOT an event on which an entity may choose to elect the fair value option for an eligible item?

A. The entity first recognizes the eligible item.
B. The entity enters into an eligible firm commitment.
C. It is the anniversary date of the FASB statement's effective date.
D. The accounting treatment for an investment in another entity changes.

Sample Application of ASC 820-10-25 (FAS-159)

The following example illustrates the application of ASC 820 (FAS-159).

Example

At December 31, 2010, Manchester Company has $9,000,000 of long-term mortgage notes payable with various rates and terms. One particular note with a carrying value of $4,000,000 has a low interest rate of 4% while the market interest rate of a note with similar terms and conditions is 6%. Federal and state tax rate is 40%. Effective January 1, 2011, Manchester elects fair value treatment for this one mortgage note under FAS 159. Details follow as of January 1, 2011:

Mortgage note balance	$4,000,000
Fair value, present value discounted at 7%	3,300,000*
Discount to fair value	$(700,000)

*assumed.

The entry is:

Allowance for mortgage adjustment	700,000	
Cumulative effect to adopt FAS-159		700,000
Cumulative effect to adopt FAS-159	280,000	
Deferred income tax liability (700,000 x 40%)		280,000

At December 31, 2011, the fair value of the mortgage note is $3,200,000 (based on the market interest rate of 8%), as follows:

Mortgage note balance	$4,000,000
Fair value, present value discounted at 8%	3,200,000*
Discount to fair value	$(800.000)

*assumed.

The entry is:

Allowance for mortgage adjustment	100,000	
Unrealized gain (income statement)		100,000
Deferred income tax expense	40,000	
Deferred income tax liability (100,000 x 40%)		40,000

The December 31, 2011 year-end financial statements would present the above transactions as follows:

Manchester Company
Balance Sheet
December 31, 2011

Option1:	
Long-term debt:	
Mortgage notes payable:	
At carrying value	5,000,000
AT fair value	**3,200,000**
Option 2:	
Long-term debt	
Mortgage notes payable (including $3,200,000 at fair value)	8,200,000

Manchester Company
Income Statement
Year ended December 31, 2011

Income from operations	XX
Other income (expenses)	
Unrealized gain in mortgage note payable:	**100,000**
Net income before income taxes	XX
Income taxes	XX
Net income	$XX

Manchester Company
Statement of Retained Earnings
Year ended December 31, 2011

Retained earnings, January 1, 2011	
As originally reported	$XX
Cumulative effect to adopt FAS 159 to reflect change to fair value for mortgage note (net of $280,000 tax effect)	**420,000**
Restated	XX
Net income	XX
Retained earnings December 31, 2011	$XX

Manchester Company
Statement of Cash Flows
Year ended December 31, 2011

Net income	
Items not affecting cash from operating activities	$XX
Depreciation	
Deferred income taxes	
Unrealized appreciation on mortgage note payable	XX
Cash from operating activities	XX
	(100,000)
	$XX

Once elected, a company may not rescind the fair value election. The statement is quite clear that the election with respect to a particular financial asset or liability is irrevocable.

Disclosures

Disclosures of fair value are required in annual and interim financial statements. The following disclosures are required under ASC 825 (FAS-159) about items for which the fair value option has been elected, as of each date for which a balance sheet is presented:

1. The reasons why the company selected the fair value option for each allowable item or group of similar items.
2. In the event the fair value option is chosen for some but not all eligible items within a group of similar items, management must describe those similar items and the reasons for partial election. In addition, information must be provided so that financial statement users can comprehend how the group of similar items applies to individual line items on the balance sheet.
3. For every line item on the balance sheet that includes an item or items for which the fair value option has been selected, management must provide information on how each line item relates to major asset and liability categories. In addition, management must provide the aggregate carrying amount of items included in each line item that are not eligible for the fair value option.
4. To be disclosed is the difference between the aggregate fair value and the aggregate unpaid principal balance of loans, long-term receivables, and long-term debt instruments with contractual principal amounts for which the fair value option has been chosen.
5. In the case of loans held as assets for which the fair value option has been selected, management should disclose the aggregate fair value of loans past due by 90 days or more. If the company recognizes interest revenue separately from other changes in fair value, disclosure should be made of the aggregate fair value of loans in the nonaccrual status. Disclosure should also be made of the difference between the aggregate fair value and aggregate unpaid principal balance for loans that are 90 days or more past due or in nonaccrual status.
6. Disclosure should be made of investments that would have been reported under the equity

method if the company did not elect the fair value option.

The following disclosures are required about items for which the fair value option has been elected, for each period for which an income statement is presented:

1. An enumeration of how dividends and interest are measured and where they are presented in the income statement.
2. Gains and losses from changes in fair value included in profit and where they are shown.
3. For loans and other receivables, the estimated amount of gains and losses (including how they were calculated) included in earnings associated with changes in instrument-specific credit risk.
4. For liabilities with fair values that have been materially impacted by changes in the instrument-specific credit risk, the estimated amount of gains and losses from fair value changes (including how they were calculated) applicable to changes in such credit risk, and the reasons for those changes.

In annual periods only, an entity shall disclose the methods and significant assumptions used to estimate the fair value of the items for which the fair value option has been elected. Also to be disclosed is qualitative information about the nature of the event as well as quantitative information, including the impact on earnings of initially electing the fair value option for an item.

Eligible Items at Effective Date

A company may select the fair value option for eligible items at the effective date. The difference between the book (carrying) value and the fair value of eligible items chosen for the fair value option at the effective date must be removed from the balance sheet and included in the cumulative-effect adjustment. These differences include: (1) valuation allowances (e.g., loan loss reserves); (2) unamortized deferred costs, fees, discounts and premiums; and (3) accrued interest associated with the fair value of the eligible item.

A company that selects the fair value option for items at the effective date must provide, in the financial statements that include the effective date, the following:

1. The impact on deferred tax assets and liabilities of selecting the fair value option.
2. The reasons for choosing the fair value option for each existing eligible item or group of similar items.
3. The amount of valuation allowances removed from the balance sheet because they applied to items for which the fair value option was selected.
4. The schedule presenting the following by line items in the balance sheet: (a) before tax portion of the cumulative-effect adjustment to retained earnings for the items on that line and (b) fair value at the effective date of eligible items for which the fair value option is selected and the book (carrying) amounts of those same items immediately before opting for the fair value option.
5. In the event the fair value option is selected for some but not all eligible items within a group of similar eligible items, a description of similar items and the reasons for the partial election. In

addition, information should be provided so financial statement users can comprehend how the group of similar items applies to individual items on the balance sheet.

Available-for-Sale and Held-to-Maturity Securities

Available-for-sale and held-to-maturity securities held at the effective date are eligible for the fair value option at that date. In the event that the fair value option is selected for any of those securities at the effective date, cumulative holding (unrealized) gains and losses must be included in the cumulative-effect adjustment to retained earnings. Separate disclosure must be made of the holding gains and losses reclassified from accumulated other comprehensive income (for available-for-sale securities) and holding gains and losses previously unrecognized (for held-to-maturity securities). There is no requirement that the gain or loss be netted against other investment gains and losses and recorded as part of other income.

If FAS 157 is adopted at the same time that FAS 159 is adopted, the change in an eligible item's fair value due to adopting FAS 157 is included as part of the cumulative-effect adjustment under FAS 159. If the fair value option is elected for a held-to-maturity or available-for-sale security, the security is reported as a trading security under FAS 115.

Example

Effective January 1, 2011, Hammer Company elects the fair value option for available-for-sale securities. Federal and state tax rate is 40%.

Balance Sheet Prior to Fair Value Option Election

	Carrying Value 1-1-2011	*Fair Value 1-1—2011*	*Unrealized Gain (Allowance)*	*Deferred Tax Liability*	*Accumulated Other Comprehensive Income (Part of Stockholders' Equity)*
Available-for-sale securities	$1,000,000	$1,300,000	$300,000	$(120,000)	$(180,000)

Prior to adopting the fair value option, the balance sheet looks like this:

Assets:	
Investments in available-for-sale securities,	
at fair value (cost $1,000,000 plus allowance of $300,000)	$1,300,000
Liabilities and stockholder's equity:	$XX
Liabilities:	$XX
Deferred tax liability	**120,000**
Stockholder's equity:	
Common stock	XX
Retained earnings	XX
Accumulated other comprehensive income	
($300,000 less tax effect of $120,000)	**180,000**
	$XX

The entry to elect the fair value option as of January 1, 2011 follows:

Accumulated other comprehensive income (SE)	180,000	
Cumulative effect to adopt FAS-159		180,000
To adopt the fair value option under FAS 159 with respect to available-for-sale securities.		

Data at December 31, 2011 follows:

	Carrying Value	*Fair Value*	*Deferred Income Tax Liability*	*Unrealized Gain*
At 1-1-2011, as adjusted	$1,000,000	$1,300,000	$(120,000)	$300,000
At 12-31-2011	1,000,000	1,400,000	(160,000)	400,000
Adjustment	$0	100,000	$(40,000)	$(100,000)

The entry is:

Allowance for unrealized gain on securities	100,000	
Unrealized gain		100,000
Deferred income tax expense	40,000	
Deferred income tax liability		40,000
To adjust fair value of available-for-sale securities at 12-31-2011.		

Hammer Company
Balance Sheet
December 31, 2011

Assets:	
Current assets:	
Investments in trading securities, at fair value (cost $1,000,000 plus allowance of $400,000)	$1,400,000
	$XX
Liabilities and stockholders' equity:	
Liabilities:	$XX
Deferred tax liability	**160,000**
Stockholder's equity:	
Common stock	XX
Retained earnings	XX
Accumulated other comprehensive income	**0**
	$XX

Hammer Company
Income Statement
Year ended December 31, 2011

Income from operations	XX
Other income (expenses)	
Unrealized gain in mortgage note payable:	**100,000**
Net income before income taxes	XX
Income taxes	XX
Net income	$XX

FASB Staff Position FAS 107-1 and APB 28-1, *Interim Disclosures about Fair Value of Financial Instruments*, states that disclosures are required about fair value of financial instruments for interim periods of public companies. A company must disclose in the body or notes to the summarized financial information the fair value of all financial instruments for which it can practically estimate fair value, whether recognized or not recognized in the balance sheet.

Fair value information disclosed in the notes shall be presented along with the related carrying amount of the asset or liability. Disclosure shall also be made of the method(s) and major assumptions used to estimate fair value of financial instruments and describe any changes in method(s) and significant assumptions.

Accounting Standards Update (ASU) No. 2009-05 (August 2009) (ASC 820, *Fair Value Measurements and*

Disclosures), *Measuring Liabilities at Fair Value*, provides information on the following:

- Offers guidance for identifying fair value in an active market. The best indication of fair value is the price in an active market. The quoted price is a Level 1 measurement. If a quoted priced for an identical liability is not present, fair value may be measured based on the prevailing price for an identical liability traded as an asset. An income method using present value or a market method may also be used (ASC 820-10-35-41) (FAS-157).
- Discusses the measurement of fair value. In measuring fair value, there is a presumption of an exchange of debt in an orderly way. In reality, the transfer of liabilities is rare; certain liabilities are traded as assets (ASC 820-10-35-16A).
- States that observable inputs should be maximized and unobservable inputs should be minimized (ASC 820-10-35-16C).
- Specifies that in measuring the fair value of a liability, the quoted price of the asset should not be adjusted for any limitation on its sale (ASC 820-10-35-16D).
- States that in valuing a liability, an independent input applicable to a limitation on liability transfer should not be included (ASC 820-10-35-16E).
- Explains that a Level 1 valuation for a liability is the quoted price in an active market. If the quoted price is adjusted, the liability has a lower level measured fair value associated with it (ASC 820-10-35-41A).
- Discusses Level 2 inputs, which, when modified, vary based on asset or liability characteristics. Factors include asset or liability status and location, activity and volume levels, and comparability of inputs (ASC 820-10-35-50) (FAS-157).

Accounting Standards Update (ASU) No. 2010-06 (January 2010) (ASC 820, *Fair Value Measurements and Disclosures*), *Improving Disclosures about Fair Value Measurements*, provides that a transfer between Levels 1 and 2 must be footnoted along with the reasons. (ASC 820-10) Gross information should be furnished for Level 3 items such as for sales. Each type of asset and liability must have a disclosure as to how fair value was determined. Valuation methods should be disclosed including inputs used (ASC 820-10-50-2) (FAS-157).

Not-For-Profit Organizations

Not-for-profit organizations apply the provisions of FAS 159 subject to the following changes:

- References to an income statement should be replaced with references to a statement of activities, statement of changes in net assets, or statement of operations. References to earnings should be replaced with references to changes in net assets.
- Health care organizations subject to the AICPA Auditing and Accounting Guide, Health Care Organizations, shall report unrealized gains and losses on items for which the fair value option has been elected within the performance indicator or as part of discontinued operations. Not-for-profit may present such gains or losses either within or outside other intermediate measures of operations unless such gains or losses are part of discontinued operations.

- The disclosure requirements apply not only with respect to the effect on performance indicators or other intermediate measures of operations, if presented, but also with respect to the effect on the change in each of the net asset classes (unrestricted, temporarily restricted, and permanently restricted), as applicable.

Where Are Fair Values Used in Financial Statements?

Creating a list of the financial statement items for which fair value reporting is required or allowed brings home the pervasiveness of fair values in financial reporting. The FASB has standardized the use of fair values in existing accounting standards. Those standards impact many of the financial reporting areas addressed in this textbook. Those areas, and the location of the relevant coverage in this text, are summarized in this section.

The purpose of this section of this fair value module is simple—to illustrate how wide-spread the use of fair value already is in financial statements. Exhibit 3 is a list of the financial statement uses of fair values. The list includes the item, a brief description of how fair value is used with that item, and a U.S. GAAP reference.

EXHIBIT 3
A LIST OF THE FINANCIAL STATEMENT USES OF FAIR VALUES

Financial Statement Item	Description of Use of Fair Value	U.S. GAAP (ASC) Reference*
Financial assets accounted for using the fair value option	Companies have the option of reporting almost any financial asset at its fair value in the balance sheet. Associated unrealized gains and losses are reported in the income statement.	ASC 825, *Financial Instrument—Fair Value Option* Subsections
Financial liabilities accounted for using the fair value option	Companies have the option of reporting almost any financial liability at its fair value in the balance sheet. Associated unrealized gains and losses are reported in the income statement.	ASC 825 *Financial Instrument—Fair Value Option* Subsections
Long-term receivables	Long-term receivables are initially recorded at the discounted value of the future contractual cash receipts under the terms of the receivable. With the correct specification of the discount rate, this approximates the fair value, or the amount for which the receivable could be sold.	ASC 835-30, *Imputation of Interest*

Investment securities	Investment securities classified as trading or available for sale are reported in the balance sheet at their fair value on the balance sheet date.	ASC 320, *Investments—Debt and Equity Securities*
Pension plan assets	Pension plan assets are reported at their fair value on the balance sheet date. This fair value, along with the projected benefit obligation, are netted against each other, and a single amount is reported in the balance sheet.	ASC 715, *Compensation—Retirement Benefits*
Assets acquired in a business combination	Assets acquired in a business combination are recorded in the books of the acquiring company at their fair value on the acquisition date.	ASC 805, *Business Combinations*
Long-lived tangible assets that are impaired	If a long-lived tangible asset is determined to be impaired, is it written down to its fair value.	ASC 360-10-35, *Impairment or Disposal of Long-Lived Assets*
Intangible assets and goodwill that are impaired	If a long-lived intangible asset, including goodwill, is determined to be impaired, is it written down to its fair value.	ASC 350, *Intangibles—Goodwill and Other*
Long-term payables	Long-term payables are initially recorded at the discounted value of the future contractual cash payments under the terms of the payable. With the correct specification of the discount rate, this approximates the fair value, or the amount which could be paid to transfer the payable obligation to a third party.	ASC 835-30, *Imputation of Interest*
Liabilities assumed in a business combination	Liabilities assumed in a business combination are recorded in the books of the acquiring company at their fair value on the acquisition date.	ASC 805, *Business Combinations*
Asset retirement obligation (ARO)	An asset retirement obligation is recognized at its fair value at the time the obligation is incurred, and that same fair value is added to the cost of the long-term operating asset being acquired.	ASC 410, *Asset Retirement and Environmental Obligations*
Valuation of nonmonetary items received such as assets or services	Nonmonetary assets or services are recorded at the fair value of the asset or service received or the asset or service given up, whichever is more clearly determinable.	ASC 845, *Nonmonetary Transactions*

***IFRS Connection**

1. No substantial differences between U.S. GAAP and IRFS. Both the FASB and the IFRS plan to have revised fair value standards finalized by 2011; the revised standards will be mutually consistent.

2. There is a fair value option for financial assets under IFRS, but as of 2011 there was not yet a fair value option for financial liabilities.

As you can see from this list, fair values are already widely used in financial statements. ASC 820 does not require additional use of fair value beyond what is required in other statements.

Fair Value Valuation

There are many possible ways to define "fair value" for financial reporting purposes. In Statement of Financial Accounting Concepts No. 5, the FASB describes five measurement attributes.

- *Historical cost:* Amount paid to acquire an asset (adjusted for depreciation).
- *Replacement cost:* Amount that would have to be paid to acquire the same or an equivalent asset.
- *Fair value:* The price that would be received to sell an asset in an orderly transaction between market participants.
- *Net realizable value:* Amount of cash into which an asset is expected to be converted in due course of business less direct costs, if any, necessary to make that conversion.
- *Present value of future cash flows*: Present or discounted value of future cash inflows into which an asset is expected to be converted. One can argue that, conceptually, the present value of future cash flow is the fair value of an asset or a liability, and that market participants implicitly do present value calculations when settling on transaction prices in markets. The FASB confirms that present value techniques are one way of estimating fair value (see ASC paragraph 820-10-55-4).

In the glossary for ASC 820-10-20, the FASB defines fair value as follows:

> *"Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between- market participants at the measurement date."*

Note that this fair value definition covers both assets and liabilities.

Inputs to Valuation Techniques. All of the valuation techniques discussed previously--market, income, and cost approaches - require data inputs in estimating a fair value. Some data inputs are independently verifiable such as market prices for shares of stock or selling prices for comparable pieces of commercial real estate. These are called *observable inputs.* In the absence of observable inputs based on market data, a company must use its own assumptions to generate reasonable estimates of the cash flow forecasts, discount rate assumptions, or other valuation inputs that would be used by market participants. These are called *unobservable inputs.* Their use should be minimized.

Examples of Valuation Models

Accountants and users associated with financial reports containing fair values should understand the valuation process and the connection between the inputs to and outputs from common valuation models.

Valuation models employ the use of both observable and unobservable inputs. Models that employ observable inputs focus on the adjustments necessary to convert the observed market data into a fair value for the asset in question. Models that employ unobservable inputs, such as models using the income approach, exhibit much greater sensitivity to the possible model inputs.

The following simple valuation models are illustrated in this section:

- Market multiples
- Matrix pricing
- Discounted cash flows
- Employee share options
- Adjusted replacement cost

Market Multiples

When it comes to stock valuation, market multiples include several pragmatic techniques such as *price-earnings (P/E), price-sales (P/S), price-dividends,* and *price-book (P/B)* ratios. As for real estate valuation, one can use *gross income multiplier, net income multiplier*, or *capitalization rate.*

Stock Valuation

Price-Earnings Ratio Method: For publicly traded stocks, stock trading prices are often directly proportional to earnings. Often, within industries, there is a consistency between companies. The price-earnings ratio method is predicated on the notion that price-earnings ratios (P/Es) of publicly traded

stocks might be indicative of a closely held company's value. The notion is this: if the closely held company were publicly traded, it would trade at a price similar to the price at which comparable companies trade. The formula for this method is as follows:

Value of the Business = Earnings per share (EPS) x Price-Earnings Multiplier (P/E)

Typically, earnings for this method is the most recent year's earnings per share (EPS) or an average of two to five prior years. The P/E multiplier is usually an historical average based on comparable, actively traded stocks. Some use a P/E ratio based on the most current period rather than an average of prior years.

Example

Earnings after taxes	$1,000,000
Outstanding shares	250,000
Earnings per share (EPS)	$4
P/E ratio	15
Estimated market price per share	$60
x Number of shares outstanding	250,000
Valuation	$15,000,000

The Price-Sales (P/S) Ratio: This is an increasingly popular tool for determining underlying stock value. It is computed as:

$$\frac{\text{Market Price Per Share}}{\text{Sales Per Share}}$$

A P/S of, say, 0.83 means you are paying 83 cents for every dollar of sales. The P/S ratio reflects a company's underlying strength. You may use the simple formula:

Expected price = projected sales per share x average P/S ratio

Example

The XYZ corporation projects sales to be $3.5 per share. The company's 5-year average P/S ratio is 14.4, which is used as the multiplier. The value of the stock is $51.0 ($3.5 x 14.4)

The Price-Dividends (P/D) Ratio: This is another popular tool for determining underlying stock value. It is computed as:

$$\frac{\text{Market Price Per Share}}{\text{Dividends Per Share}}$$

You may use the simple formula:

Expected price = projected dividends per share x average P/D ratio

Example

The XYZ Corporation projects dividends to be $0.88 per share. The company's 5-year average P/D ratio is 61.3, which is used as the multiplier. The value of the stock is $53.94 ($0.88 x 61.3)

The Price-Book (P/B) Ratio: The price-book (P/B) ratio is a ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share. Book value (net asset, liquidation value) per share is the amount of corporate assets for each share of common stock.

$$\frac{\text{Market Price Per Share}}{\text{Book Value Per Share}}$$

where book value per share = total stockholders' equity/total shares outstanding.

You may use the simple formula:

Expected price = projected book value per share x average P/B ratio

Example

The XYZ corporation projects the book value per share to be $60 per share. The company's 5-year average P/B ratio is .8, which is used as the multiplier. The value of the stock is $48 ($60 x .8)

Note: Various financial services track industries and companies. They offer expectations as to future earnings, sales, dividends, book value and even market prices of stock. For example, Tomson Reuter's *Institutional Brokers Estimate System* (I/B/E/S) is a database available on CompuServe that provides consensus earnings estimates on more than 21,000 companies in 480 established and emerging markets worldwide. *Zacks* performs a similar service and is available through Dow Jones News/Retrieval. These provide a thorough analysis of companies and provide clues as to future expectations and a source of earnings estimates.

Bond Valuation

A long-term bond produces two cash flows: (1) periodic interest payments during the life of the bond, and (2) the principal (face value) paid at maturity. At the date of issue, bond buyers determine the present value of these two cash flows using the market rate of interest.

The periodic interest payments represent an annuity. The principal represents a single-sum problem. The current market value of the bonds is the combined present values of the interest annuity and the principal amount. The interest is usually paid semiannually.

$$V = \sum_{t=1}^{n} \frac{I}{(1+r)^t} + \frac{M}{(1+r)^n}$$

$$= I \times T2(i,n) + M \times T1(i,n)$$

where I = interest payment per period
M = par value, or maturity value (usually $1,000)
i = investor's required rate of return
n = number of periods
T1 = present value of $1 (from Table 1 in the Appendix)
T2 = present value of an ordinary annuity of $1 (from Table 2 in the Appendix)

Example

Myra Corporation on January 1, 2X12 issues $100,000 of 8% bonds due in 5 years with interest payable annually at year-end. Investors consider 12 percent to be an appropriate required rate of return in view of the risk level associated with this bond. The annual interest payment is $80 (8% x $1,000). The present value of this bond is:

$$V = \sum_{t=1}^{n} \frac{I}{(1+i)^t} + \frac{M}{(1+i)^n}$$

$$= I \times T2(r,n) + M \times T1(r,n)$$

$$= \sum_{t=1}^{10} \frac{\$8,000}{(1+0.12)^t} + \frac{\$100,000}{(1+0.12)^{10}}$$

= $8,000 x T2(12%,5) + $100,000 xT1(12%,5)
= $8,000(3.605) + $100,000(0.567)
= $28,840 + $56,700
= $85,540

Note: By paying $85,540 at date of issue, the buyers of the bonds will realize an effective yield of 12% over the 5-year term of the bonds. This is true because Myra discounted the cash flows at 12%.

If the interest is paid semiannually, then

$$V = \sum_{t=1}^{2n} \frac{I/2}{(1+2/r)^t} + \frac{M}{(1+r/2)^{2n}}$$

= I/2 xT2(r/2,2n) + M xT1(r/2,2n)

Example

Assume the same data as in the previous example, except the interest is paid semiannually.

$$V = \sum_{t=1}^{20} \frac{\$4{,}000}{(1+0.06)^t} + \frac{\$100{,}000}{(1+0.6)^{10}}$$

= $4,000 xT2(6%,10) + $100,000 xT1(6%,10)
= $4.000(7.360) + $100,000(0.558)
= $29,440 + $55,800
= $85,240

Real Estate Valuation

There are several rule of thumb methods to arrive at the estimated value of an income-producing property. They include:

Gross Income Multiplier: Gross income multiplier is calculated as: Purchase price/gross rental income.

Example

Mr. Smith is considering a duplex apartment. The property is located in an attractive suburb. The cost of the building is $219,000. Assume the following data for the property:

ANNUAL PROPERTY OPERATING DATA (12 MONTHS – PROJECTED)			
Gross Scheduled Income			$22,800
+ Other Income			800
Total Gross Income			23,600
- Vacancy/Credit Losses (2%)			472
Gross Operating Income (GOI)			23,128
Operating Expenses (with percent of GOI)			
Property insurance	1.93%	$446	
Real Estate Taxes	13.22%	3,058	
Repairs and Maintenance	1.45%	335	
Sewer and Water	2.90%	671	
Total Operating Expenses (19.50%)			4,510
Net Operating Income (80.50%)			18,618
- Debt Service (Principal and Interest)			21,601
Before-Tax Cash Flow			($2,983)

In Mr. Smith's example, the gross income multiplier is:

$$\$219{,}000 / \$23{,}600 = 9.28$$

A duplex in the similar neighborhood may be valued at "8 times annual gross." Thus, if its annual gross rental income amounts to $23,600, the value would be taken as $188,800 (8 x $23,600).

Net Income Multiplier: Net income multiplier is calculated as: Purchase price/net operating income (NOI). *Note:* This is equivalent to the price-earnings (P/E) ratio used in the analysis of stocks.

In Mr. Smith's example, the net income multiplier is:

$$\$219{,}000/\$18{,}618 = 11.76$$

Capitalization rate: Capitalization rate is almost the same as the net income multiplier, only used more often. It is the reciprocal of the net income multiplier. That is:

Net operating income (NOI)/purchase price

Example

Let us go back to Mr. Smith's example. The duplex's capitalization rate is $18,618/$219,000 = 8.5%. Whether it is over-priced or not depends on the rate of the similar type property derived from the market place. Suppose the market rate is 10%. That means the fair market value of the similar duplex is $18,618/10% =$186,180. Mr. Smith may be overpaying for this property.

Discounted cash flows (DCF): This method uses the present value technique under which the asking price or value of a real estate investment is the present worth of the future after-tax cash flows from the investment, discounted at the rate of return required by the investor.

Example

You require a rate of return of 10 percent on a piece of property advertised for sale at $150,000. You estimate that rents can be increased each year for five years. You expect that after all expenses you would have an after-tax cash flow of $5,000, $5,200, $5,400, $5,600, and $5,800 for each year. You also expect that this property can sell for 200,000 at the end of the fifth year. To determine the amount you would be willing to pay for this property, we can set up the present value table as follows:

Year	*After-tax cash flow*	*Present value of $1 =T1 (Table 1)*	*Present Value*
1	$5,000	.909	$4,545
2	5,200	.826	4,295
3	5,400	.751	4,055
4	5,600	.683	3,825
5	5,800	.621	3,602
Sell property	$200,000	.621	124,200
Present value of property			$144,522

You would be willing to pay $144,522 for this property.

Matrix Pricing

Matrix pricing is a mathematical method used primarily to value debt securities without solely relying on quoted prices for the particular securities. This method relies on the relationship of the securities to other benchmark quoted securities.

Example

Debreu Company has purchased two corporate bonds as temporary investments. The bond investments are to be reported in Debreu's books at their fair values on the balance sheet date. Each of the bonds has unique terms, and the bonds are not traded in active markets, so Debreu cannot look to quoted market prices to directly determine how much each bond would bring in a sales transaction. However, Debreu has assembled the following matrix of bond price data for actively traded bonds which can be used to indirectly estimate the selling price of each of Debreu's bonds.

Bond Prices (% of par)					
	Bond Ratings				
Term (in years)	*AAA*	*AA*	*A*	*BBB*	*B*
2	103.85	103.56	102.71	102.37	100.29
5	103.66	102.53	101.45	100.17	98.5
10	101.64	100.29	99.56	98.54	91.98
20	95.66	91.49	90.00	89.31	82.06

Debreu has learned that the selling price of a bond is related to both its term (the number of years until the bond matures) and to the underlying riskiness of the company that issued the bond. *(Note:* Another important valuation variable is the coupon interest rate on the bond. In this example, that rate is assumed to be the same for all bonds and so is ignored in this analysis.) This underlying riskiness is represented by the "bond rating" which is a label attached to a bond by a bond rating agency such as Standard & Poor's. The rating agency assigns the rating after an analysis of the bond issuing company's finances and the strength of its industry. A lower bond rate (AAA is the highest in the table and BB is the lowest) indicates that rating agency views the bond issuing company as being more risky. The higher this risk, the lower the bond price if everything else is held constant. Also, somewhat independent of the underlying riskiness of the bond issuing company, the longer time until a bond matures the more risk is associated with the bond. Thus, holding all else constant, bonds with longer times to maturity have lower prices.

For the two bonds it purchased, Debreu has determined the time to maturity and has also looked up the bond rating from Standard & Poor's. These data for the two bonds are as follows:

	Term	*Bond Rating*
ABC Bond	15	AA
XYZ Bond	6	BBB

The fair value of each of the two bonds can be estimated as follows. (Note: The par value of each of the bonds is $1,000, and the numbers given in the matrix of bond prices are expressed in terms of a percentage of par value.)

ABC Bond

- Look at the AA bond rating column.
- Based on the term of the bond, ABC Bond is exactly halfway between 100.29 and 91.49.
- Estimated bond price as a percent of par = 95.89 = 100.29 - 0.5(100.29 - 91.49)
- Estimated price of ABC Bond= 0.9589 x $1,000 = $958.90

XYZ Bond

- Look at the BBB bond rating column.
- Based on the term of the bond, XYZ Bond is 20% of the way from 100.17 to 98.54.
- 6 Estimated bond price as a percent of par = 99.844 = 100.17 - 0.2(100.17 - 98.54)
- Estimated price of XYZ Bond = 0.99844 x $1,000 = $998.44

Discounted Cash Flows (DCF)

The DCF are tools used to convert future amounts (e.g., profits, cash flows) to a present value amount. For example, future cash flows are discounted to their present value amount using the present value tables. The measurement is based on market expectations of the future amounts. As described in SFAC No.7, the present value of future cash flows can be used to estimate fair value in one of two ways. In the traditional approach, which is often used in situations in which the amount and timing of the future cash flows are deter-mined by contract, the present value is computed using a risk-adjusted interest rate that incorporates expectations about the uncertainty of receipt of the future contractual cash flows. In the expected cash flow approach, a range of possible outcomes is identified, the present value of the cash flows in each possible outcome is computed (using the risk-free interest rate), and a weighted-average present value is computed by summing the present value of the cash flows in each outcome, multiplied by the estimated probability of that outcome. To illustrate the traditional and the expected cash flow approaches, consider the following two examples.

Traditional Approach: A Delta Digital asset has the right to receive royalty payments in the future. The future royalty cash flows are $10,000 at the end of Year1, $20,000 in Year2, and $5,000 in Year 3. The risk-free interest rate is 5%; the receipt of these royalty cash flows is not certain, so a risk-adjusted interest rate of 10% is used in computing their present value. The fair value of Delta Digital is estimated as follows:

The present value of this series of mixed streams of cash inflows is calculated as follows:

Year	*Cash inflows*	*x*	*T1(10%, n)**	*Present Value*
1	$10,000		0.909	$9,090
2	$20,000		0.826	$16,520
3	$5,000		0.751	$3,755
				$29,365

* From Table 1 in the Appendix.

This $29,365 amount is the estimated fair value of Delta Digital.

Expected cash flow model: Traditionally, most accounting calculations of present value relied on the most likely cash flow amount. FASB introduces an *expected cash flow approach*. ("Using Cash Flow Information and Present Value in Accounting Measurements," *Statement of Financial Accounting Concepts No. 7* (SFAC No. 7). It uses a range of cash flows and incorporates the probabilities of those cash flows to provide a more relevant measurement of present value. In using the present value method, the company must discount future estimated cash flows based on a credit-adjusted risk-free rate (e.g., rate on a zero-coupon U.S. Treasury Security) increased for the company's actual credit risk. After the final rate is decided on, the present value of cash flow calculation must reflect any relevant probabilities, uncertainties, and assumptions. Multiple cash flow and probability scenarios are used based on a range of possible outcomes.

Example

Suppose that Sonic Electronics offers a 2-year warranty on all products sold. In Year 1 Sonic Electronics sold $200,000 of a particular type of washer/dryer. Sonic Electronics entered into an agreement with Ralph's Repair to provide all warranty service on the dryers sold in Year 1. To determine the warranty expense to record in Year 1 and the amount of warranty liability to record on the December 31, Year 1, balance sheet, Sonic Electronics must measure the fair value of the agreement. Since there is not a ready market for these warranty contracts, Sonic Electronics uses expected cash flow techniques to value the warranty obligation.

Based on prior warranty experience, Sonic Electronics estimates the expected cash outflows associated with the dryers sold in Year 1, as shown in Exhibit 4. It shows Sonic Electronics' estimated warranty cash outflows of $6,725 in Year 1 and $7,200 in Year 2. The last column the present value of these cash flows, assuming a risk-free rate of 6 percent and cash flows occurring at the end of the year.

EXHIBIT 4

EXPECTED CASH OUTFLOWS

AND PRESENT VALUE CALCULATIONS

	Cash Flow Estimate	*x*	*Probability*	=	*Expected Cash Flow*	*x*	*PV of $1 =T1(6%,n)*	=	*Present Value*
	$ 4,700		25%		$ 1,175				
Year 1	6,500		50%		3,250				
	9,200		25%		2,300				
			Total		$ 6,725		0.943		$ 6,341.68
	$ 5,300		25%		$ 1,325				
Year 2	7,000		50%		3,500				
	9,500		25%		2,375				
			Total		$ 7,200		0.890		$ 6,408.00
									$ 12,749.68

Note: In applying the expected cash flow approach, we really should take the analysis one step further and convert the expected cash flows into "certainty equivalents." The basic idea is that there is a lower amount of cash that you would accept for sure in exchange for a higher, uncertain amount.

Example

If a quoted market price in an active market or the price of a similar liability is not available, a present value method may be used to estimate fair value. Hence, probability-weighted present values, not undiscounted amounts, may be used to measure the asset retirement obligation. The fair value of the asset retirement obligation liability is recognized when incurred.

A long-lived asset's carrying cost includes a $250,000 original cost plus the capitalized retirement cost of $53,459, which equals the initial liability amount. The business entity incurs an obligation to retire the asset upon installation. The asset retirement obligation is based on the following data:

Original cost	$250,000
Credit-adjusted risk-free rate at date of installation	8%

Depreciation is based on the straight-line method for a five-year period of benefit.

The four possible alternative estimated market-based cash flows in year 5 to settle the obligation, along with their related probabilities are:

Scenario	*Projected Cash Outflow (Year 5)*	*Probability*
1	$100,000	30%
2	80,000	35%
3	70,000	15%
4	50,000	20%
Total probability		100%

The computation of the capitalized retirement cost of $53,426 follows:

Scenario	*Projected Cash Outflow (Year 5)*	*Probability*	*Weighted Cash Outflow*
1	$100,000	30%	$30,000
2	80,000	35%	28,000
3	70,000	15%	10,500
4	50,000	20%	10,000
Expected cash outflow			$78,500
Present value for year 5 at 8% = Table 1 = 0.681			$53,459

The retirement entry for the long-term asset, based on the assumption that actual cash flows to settle the retirement liability, are the same as those projected follows:

Accumulated depreciation	303,459	
Asset retirement liability	78,500	
Long-term asset		303,459
Cash		78,500

Choosing an Appropriate Discount Rate. The FASB takes the position that after computing the expected cash flows, a company should discount those cash flows by the risk-free rate of return. That rate is defined as the pure rate of return plus the expected inflation rate. The Board notes that the expected cash flow framework adjusts for credit risk because it incorporates the probability of receipt or payment into the computation of expected cash flows. Therefore, the rate used to discount the expected cash flows should consider only the pure rate of interest and the inflation rate. On the other hand, ASC 820-10-35-15A and 35-55[A-B] (FAS 157-3, *Determining the Fair Value of a Financial Asset When the Market for That Asset Is Not Active*) states that irrespective of the valuation technique, a company must include suitable risk adjustments that market participants would use for nonperformance and liquidity risks.

When markets are not active, brokers may rely on models with inputs based on information available to the broker. An income approach (e.g., present value) may be used to maximize the use of relevant observable inputs to value a financial asset that is *not* actively traded. A discount rate adjustment technique may be used to determine fair value of a financial asset at the measurement date. Risks considered in the discount rate include liquidity risk (e.g., difficulty selling an asset under present market conditions) and nonperformance risk (e.g., collateral value risk, default risk).

Employee Share Options

ASC 718-10-05 (FAS-123R, *Share-Based Payment*) requires a public entity to measure the cost of employee services received in exchange for an award of equity instruments based on the grant-date fair value of the award. A few valuation models are described below.

The Black-Scholes-Merton Option Pricing Model: The model provides the relationship between call option value and the five factors that determine the premium of an option's market value over its expiration value:

1. Time to maturity. The longer the option period, the greater the value of the option.
2. Stock price volatility. The grater the volatility of the underlying stock's price, the greater its value.
3. Exercise price. The lower the exercise price, the greater the value.
4. Stock price. The higher the price of the underlying stock, the greater the value.
5. Risk-free rate. The higher the risk-free rate, the higher the value.

The formula is

$$V = P[N(d_1)] - PV(E)\,[N(d_2)]$$

where V = Current value of a call option

P = current stock price

PV(E) = present value of exercise or strike price of the option, E

$= E/\, e^{-rt}$

r = risk-free rate of return, continuously compounded for t time periods

e = 2.71828

t = number of time periods until the expiration date (ex: 3 months means t = 3/12 = 1/4 = 0.25)

N(d) = probability that the normally distributed random variable Z is less than or equal to d

σ = standard deviation per period of (continuously compounded) rate of return on the stock

$d_1 = \ln[P/PV(E)]/\sigma\sqrt{t} + \sigma\sqrt{t}/2$

$d_2 = d_1 - \sigma\sqrt{t}$

The formula requires readily available input data, with the exception of σ^2, or volatility. P, X, r, and t are easily obtained. The implications of the option model are as follows**:**

1. The value of the option increases with the level of stock price relative to the exercise price [P/PV(E)], the time to expiration, and the time to expiration times the stock's variability ($\sigma\sqrt{t}$).
2. Other properties:
   a) The option price is always less than the stock price.
   b) The option price never falls below the payoff to immediate exercise (P - E or zero, whichever is larger).
   c) If the stock is worthless, the option is worthless.
   d) As the stock price becomes very large, the option price approaches the stock price less the present value of the exercise price.

Example

The current price of Sigma Corporation's common stock is $59.375 per share. A call option on this stock has a $55 exercise price. It expires in 30 days. If the standard deviation of continuously compounded rate of return on the stock is 0.2968 and the risk free rate is 5 percent per year, the value of this call option is:

First, calculate the time until the option expires in years,

t in years = 30 days/365 days = 0.0822

Second, calculate the values of the other variables:

PV(E) = E/ ert = $55/$e^{0.05 \times 0.0822}$ = $54.774

d1 = ln[P/PV(E)]/$\sigma\sqrt{t}$ + $\sigma\sqrt{t}$ /2

= ln[$59.375/$54.774]/(0.2968 x $\sqrt{0.0822}$) + (0.2968 x $\sqrt{0.0822}$)/2 = 0.9904

d2 = d1 - $\sigma\sqrt{t}$ = 0.9904 - 0.2968 x $\sqrt{0.0822}$ = 0.9053

Next, Use a table for in the standard normal distribution (See the Appendix) to determine N(d1) and N(d2):

N(d1) = N(0.9904) = 0.8389
N(d2) = N(0.9053) = 0.8173

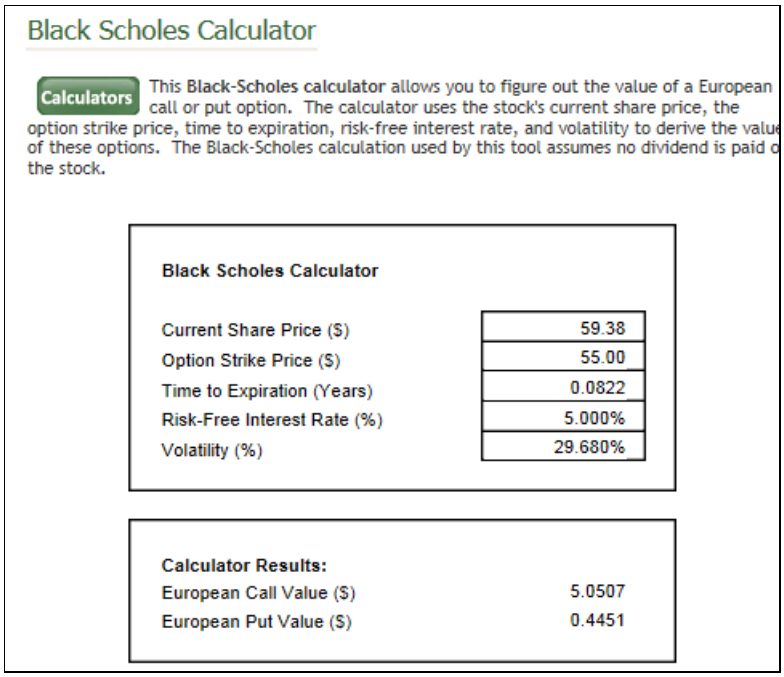
Finally, use those values to find the option's value:

V = P[N(d1)] – PV(E) [N(d2)]
= $59.375[0.8389] - $54.774[0.8173]
= $5.05

This call option is worth $5.05, a little more than its value if it is exercised immediately, $4.375 ($59.375 - $55), as one should expect.

Note: Many websites provide a calculator for option calculations. One example is given in Exhibit 5.

EXHIBIT 5
BLACK-SCHOLES CALCULATOR



Source: www.money-zine.com/Calculators/Investment-Calculators/Black-Scholes-Calculator.

Example

You want to determine the value of another option on the same stock that has an exercise price of $50 and expires in 45 days. The time until the option expires in years is t in years = 45 days/365 days = 0.1233

The values of the other variables are:

PV(E) = E/ ert = $50/$e^{0.05 \times 0.1233}$ = $49.6927

d1 = ln[P/PV(E)]/ $\sigma\sqrt{t}$ + $\sigma\sqrt{t}$ /2 = ln[$59.375/$49.6927]/(0.2968 x $\sqrt{0.1233}$) + (0.2968 x $\sqrt{0.1233}$)/2 = 1.7602

d2 = d1 - $\sigma\sqrt{t}$ = 1.7602 - 0.2968 x $\sqrt{0.1233}$ = 1.6560

Next, Use a table for the standard normal distribution (See Table 3 in Appendix to determine N(d1) and N(d2):

N(d1) = N(1.7603) = 0.9608
N(d2) = N(1.6560) = 0.9511

Finally, use those values to find the option's value:

V = P[N(d1)] – PV(E) [N(d2)]
= $59.375[0.9608] - $49.6927[0.9511]
= $9.78

The call option is worth more than the other option ($9.78 versus $5.05) since it has a lower exercise price and a longer time until expiration.

Other Lattice-based Option Models: The Black-Scholes-Merton Model is viewed by some as overstating the value of employee stock options, because the model does not take into account the essential differences between traditional exchange-traded stock options and those granted to employees. Unlike conventional options, employee options are subject to vesting schedules and forfeiture conditions, and cannot be transferred. As a result, they are invariably exercised before their usual 10-year term expires. These characteristics reduce the value of an option. *Note*: ASC 718-10-05 (FAS-123R, *Share-Based Payment)* does not specify a preference for a particular valuation technique or model in estimating the fair values of employee share options. It recognizes, however, that a lattice-based method can take into account assumptions that reflect the conditions under which employee options are typically granted. The binomial model is the most commonly used lattice-based method, but other methods may be better suited to compensation programs that link vesting to specific performance objectives. Each of these models is outlined below.

Binomial. Unlike Black-Scholes-Merton the binomial method divides the time from the option's grant date to the expiration date into small increments. Since the share price may increase or decrease during any interval, the binomial model takes into account how changes in price over the term of the option would affect the employee's exercise practice during each interval. The binomial model can also consider an option grant's lack of transferability, its forfeiture restrictions, and its vesting restrictions — even for options with more-complicated terms such as indexed and performance-based vesting restrictions.

Trinomial. The trinomial model goes a step further by allowing for the underlying stock price to either remain unchanged or move up or down. That is useful for valuing performance-based options that vest only if the stock price exceeds a certain level over time.

Multinomial. This model can take many more factors into account than either the binomial or trinomial framework. Such additional flexibility may be required to value options that cannot be exercised unless the underlying stock price exceeds the performance of one or more indices. But when there are more than two such sources of uncertainty, a Monte Carlo simulation may be preferable, since it is easier to apply than lattice models.

Note: For one thing, the new models are far less familiar than Black-Scholes-Merton, so users must spend considerable time figuring out how to use it. Black-Scholes-Merton is so widely used that there are lots of

software packages and Black-Sholes calculators on the Internet (such as the one in Exhibit 5) to run the model.

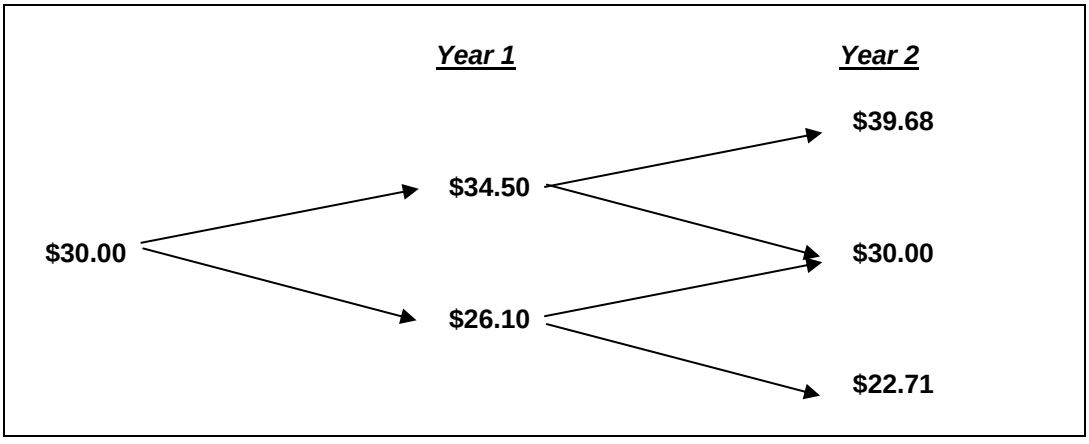
The Binomial Model: Lattice-based option pricing models, such as the binomial mode, can explicitly capture assumptions about employee exercise behavior over the life of each option grant, expected changes in dividends, and stock volatility over the expected life of the options, in contrast to the Black-Scholes-Merton model, which uses weighted average assumptions about option characteristics.

Example

Exhibit 6 illustrates a simple two-year lattice model that portrays the expected price changes of the security, along with their chance of occurrence. Each node of the lattice reflects an expected share price at year-end. These expectations are developed through analysis of the security's historical volatility and its expected future volatility. Volatility, measured by the expected standard deviation of the returns of a security, then determines expected share price fluctuations over time. In turn, these potential share price fluctuations are a major factor in estimating option value. Exhibit 6 presents an example with a 64% probability that the price of the security will increase 15% (from $30.00 to $34.50) and a 36% chance that the price will decline by 13% (from $30.00 to $26.1). Assume that the probabilities and percentage price increases are the same for each of the two years. For example, if the price does go up to $34.50 in year 1, there is a 64% chance that it will go up again in year 2 (to $39.68) and a 36% chance that it will decline in year 2 (back to $30.00).

Exhibit 7 shows how option values are determined. Assume that fully vested stock options have been granted with an exercise price of $30.00 and a term of two years. Therefore, the holder of the option can buy shares of stock for $30.00 until the option expires in two years. If the share price increases in both years 1 and 2, the option holder will net $9.68 ($39.68 - $30.00) upon exercise of the option. If the share price stays at $30.00 a share or falls to $22.71 at the end of year 2, the option holder will not exercise, as the share price does not exceed the exercise price.

EXHIBIT 6
TWO-YEAR BINOMIAL LATTICE



If the share price has a value of $30.00 or less at the end of the two-year period, there is neither gain nor loss for the holder. The option simply expires unexercised. At the time of the option grant, the option clearly has value. It is more likely that the stock will have a value greater than $30.00 at the end of two years, and the holder will not suffer any loss if it does not.

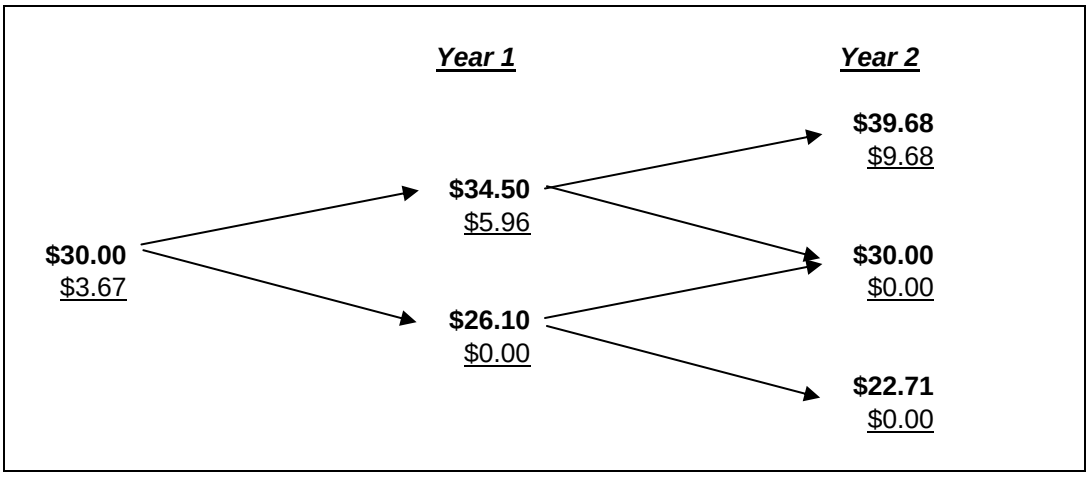
The mechanics of calculating the option value at the time of grant begin by determining the option value at the expiration period and working backward to the date of the grant. At the end of year 1, the share price will have either increased to $34.50 or fallen to $26.10. If the share price is $34.50 at the end of year 1, the option holder has an asset that will either rise to $9.68 (share price of $39.68) or fall to $0 (share price of $30.00). The respective probability of these outcomes is 64% and 36%. Using a 4% risk-free rate as a time value of money discount rate, the value of the option in year 1 will be $6.05:

[(64% x $9.68) ÷ 1.04] + [(36% x $0) ÷ 1.04] = $5.96

Continuing to work backward in time, the value of the option at the grant date is based upon the option values at the end of year 1. The calculation is the same as in the previous example, and yields an option value of $3.67, the present value of $5.96 and $0 weighted by the probabilities of each outcome occurring:

[(64% x $5.96) ÷ 1.04] + [(36% x $0) ÷ 1.04] = $3.67

EXHIBIT 7
TWO-YEAR BINOMIAL LATTICE WITH OPTION VALUES



Thus, the option value is based upon the expected share price at each node on the lattice. If the historical volatility is higher, and the future volatility is projected to be higher, other things being equal, the option will have more value; the higher the probability of an increase in stock price, the higher the value of the

option. There is no real risk of loss to the option holder, who will simply not exercise the option if the stock price declines. Therefore, as long as there is a positive probability that the price will rise above the exercise price, the option has value.

The analysis above illustrates the value of transferable options at the grant date. Employee stock options, however, are not transferable, and this affects their value.

Nontransferability and Early Exercise. In the above example, if the share price has risen to $34.50, the option would be worth $5.96, factoring in the possibility of a rising price in year 2. But if the option cannot be sold, the option holder must choose between exercising the option at the end of year 1 and holding it until the end of year 2. If the holder opts to exercise the option at the end of year 1, the proceeds would be only $4.50.

Because they cannot sell the option in the open market, many employees will exercise their options early to realize a gain rather than take the chance that the share price will fall. In other words, the option is worth only $5.96 at the end of year 1 if it can be sold. There is a positive probability that the stock will rise in year 2 and be worth $9.68, but it also might decline and become worthless. Employees may prefer to take a profit of $4.50 rather than risk losing all the potential value. The result of the potential early exercise is that the grant date value of the option falls from $3.67 to $2.77:

$$[(64\% \times \$4.50) \div 1.04] + [(36\% \times \$0) \div 1.04] = \$2.77$$

The reduced option value is due to the increased likelihood of early exercise that nontransferability represents.

Adjusted Replacement Cost

The *cost approach* is based on the amount that would be required to replace an asset's service capability (*current replacement cost*). An example is the cost to purchase or build a substitute asset of comparable utility after adjusting for obsolescence.

Example

Robinson Company has purchased the site of a ski resort for $10 million. Robinson must now estimate the fair values of the assets acquired in the purchase in order to properly record the acquisition. One of the assets is a ski lift system that is still fully functional. Because ski lift systems are of necessity tied to specific resorts and the contours of the resort's ski runs, there is no practical way to directly determine a selling price for this particular system. However, Robinson can estimate how much it would cost to duplicate the system with new construction. That cost is $1,200,000. The existing system has been in use for five years, and such systems are typically assumed to have useful lives of 20 years with a 10% salvage value. In a process exactly analogous to the computation of depreciated book value, we can estimate a "depreciated" replacement cost of $930,000. The computations are as follows:

- ($1,200,000 - $120,000) ÷ 20 years = $54,000 "depreciation" per year
- 5 years x $54,000 "depreciation" per year = $270,000 total "depreciation"
- $1,200,000 replacement cost new - $270,000 "depreciation" = $930,000 adjusted replacement cost

This $930,000 adjusted replacement cost is a cost-based estimate of the fair value of the ski lift system.

Illustrations of Fair Value Disclosures - Reliability Assessment

The reliability of inputs into valuation models is not the same in all circumstances and for all models. As a result, the output from the models can vary substantially in reliability. In Topic 820, the FASB requires disclosures that help financial statement users assess the reliability of the fair values used in preparing the financial statements.

Level 1 inputs are the most reliable and are quoted prices in active markets for identical assets or liabilities. Level 2 inputs are of intermediate reliability and are prices for similar (but not identical) assets or liabilities or observable market inputs used in a valuation model. Level 3 inputs are unobservable inputs such as internal cash flows forecasts, discount rate estimations, and so forth.

Fair value measurements are generated with a combination of observable and unobservable inputs. Consider the example of Company A estimating the fair value of its investment in the common stock of Company B. Examples of observable inputs are the quoted price of Company B stock and market multiples (such as price-to-sales ratio, price-earnings ratio, and price-to-book ratio) for Company B and other companies in its industry. Examples of unobservable inputs are Company A's own estimate of the future cash flows to be generated by its investment in Company B and its estimate of the appropriate rate of return to use in valuing those cash flows. In using valuation techniques to generate fair values, the FASB requires companies to maximize the use of observable inputs and minimize the use of unobservable inputs.

Recall that the FASB has refined this observable/unobservable dichotomy into a 3-way "fair value hierarchy," (1) Level 1 inputs (quoted prices in active markets for identical assets or liabilities, (2) Level 2 inputs (observable inputs other than quoted prices in active markets for identical assets or liabilities), and Level 3 inputs (unobservable inputs). In generating fair values, Level 1 inputs are preferable to Level 2 inputs, which in turn are preferable to Level 3 inputs. Back to the Company A valuation of its investment in Company B mentioned above, Company A should use the quoted price of Company B stock if such a price exists. In the absence of such a price, Company A should maximize its use of market multiples and other market data for similar companies. Finally, if no market-supported data exist relative to the fair

value of Company B, then Company A should use its own internally generated cash flow and required rate of return estimates.

Clearly, a fair value generated with Level 1 inputs is more reliable and involves less uncertainty than a fair value generated with Level 3 inputs. Accordingly, under the provisions of ASC 820, a company is required to provide quantitative disclosure about the source of the inputs into its fair value computations.

These fair value disclosures fall into two categories. The first category is for assets (and liabilities) that are measured at fair value on a recurring basis. Examples are trading securities, available-for-sale securities, and derivatives. These items are reported at their fair values on every reporting date. For items measured at fair value *on a recurring basis*, the first required valuation input disclosure is a simple table with the assets as the rows and the three input levels as the columns. Exhibits 8 and 9 are examples of disclosures concerning assets measured at fair value on a recurring basis. Information is presented separately for each major category. A similar table must be disclosed for liabilities.

EXHIBIT 8
DISCLOSURES CONCERNING ASSETS MEASURED
AT FAIR VALUE ON A RECURRING BASIS

($ in 000s)		Fair Value Measurements at Reporting Date Using		
		Quoted Prices in Active Markets for Identical Assets	Significant Other Observable Inputs	Significant Unobservable Inputs
Description	12/31/2X12	(Level 1)	(Level 2)	(Level 3)
Trading securities	$115	$105	$10	
Available-for-sale securities	75	75		
Derivatives	60	25	15	$20
Venture capital investments	10			10
Total	$260	$205	$25	$30

Source: Adapted from FASB ASC paragraph 820-10-55-61.

To illustrate what additional information this disclosure provides beyond the summary fair value measurements, consider the values reported for the available-for-sale securities ($75) and the venture capital investments ($10). The data in this exhibit tell the financial statement user that there is a large difference in the reliability of these two numbers even though both are reported as "fair value"" numbers in the balance sheet. The $75 number is extremely reliable because, as noted in the heading, it comes from "quoted prices in active markets for identical assets. In contrast, the $10 number is not as reliable because it stems from internal judgments and estimates that have not been corroborated by independent market observations.

The preceding paragraph highlights that the greatest concern regarding fair value numbers is with the numbers generated using Level 3 inputs. As a result, further disclosure is required for these fair values. A reconciliation of the beginning and ending balances is required for any assets or liabilities measured at fair value on a recurring basis that use significant unobservable inputs (that is, Level 3) during the period. This table presents a beginning and ending balance reconciliation, or rollforward, for the fair values generated using Level 3 inputs. In summary, for items measured at fair value on a recurring basis, an overall table is presented showing the relative magnitudes of fair values computed using Level 1, Level 2, and Level 3 inputs. In addition, a more detailed table is provided for the values generated using Level 3 inputs showing an explanation of the change in the fair value amounts from the beginning of the period to the end of the period.

EXHIBIT 9
A RECONCILIATION OF THE BEGINNING AND ENDING BALANCES
FOR ANY ASSETS OR LIABILITIES MEASURED AT FAIR VALUE ON A RECURRING BASIS

($ in 000s)	**Fair Value Measurement Using Significant Unobservable Inputs (Level 3)**		
		Venture Capital	
	Derivatives	***Investments***	***Total***
Beginning balance	$14	$11	$25
Total gains or losses (realized/unrealized)			
Included in earnings (or changes in net assets)	11	(3)	8
Included in other comprehensive income	4		4
Purchases, issuances, and settlements	(7)	2	(5)
Transfers in and/or out of Level 3	(2)	0	(2)
Ending balance	$20	$10	$30
The amount of total gains or losses for the period included in earnings (or changes in net assets) attributable to the change in unrealized gains or losses relating to assets still held at the reporting date	$7	$2	$9

Most balance sheet items are *not* reported at fair value on a recurring basis but are occasionally reported at fair value. A common example is impaired assets. The required disclosure for assets reported at fair value *on a nonrecurring basis* is given in Exhibit 10.

EXHIBIT 10

DISCLOSURE FOR ASSETS REPORTED AT FAIR VALUE ON A NONRECURRING BASIS

		Fair Value Measurement Using			
Description	Year Ended 12/31/2X12	Quoted Prices In Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total Gains (Losses)
Long-lived assets held and used	$75		$75		($25)
Goodwill	30			$30	(35)
Long-lived assets held for sale	26		26		(15)
					($75)

Source: Adapted from FASB ASC paragraph 820-10-55-64.

Notice that with items reported at fair value on a nonrecurring basis, it is unlikely that Level 1 inputs will be available. Also, note that the final column, containing the gains and the losses, is a very condensed version of Exhibit 9, the rollforward table, required for the items that are reported at fair value on a recurring basis.

The Level 1, Level 2, and Level 3 disclosures required under ASC 820 help accountants, auditors, and users of financial statements assess the reliability of the fair value numbers used in preparing the financial statements. Keep in mind that the strong point of fair values is that they are very relevant, but the downside is that they sometimes lack reliability. The ASC 820 disclosures enable the assessment of that reliability.

Review Questions – Section 3

20. Which of the following is the correct way to report assets and liabilities on the balance sheet under the fair value option?

A. Use two separate line items for fair value and non-fair value carrying amounts.
B. Combine assets and liabilities on a net basis.
C. Create a separate fair value mezzanine section between current and long-term debt
D. Place assets and liabilities in the long-term assets and liabilities sections.

21. If the fair value option is elected for available-for-sale or held-to-maturity securities, which of the following is correct as it relates to cumulative unrealized gains and losses at the effective date? They are:

A. Included in income from continuing operations.
B. Recorded as part of other comprehensive income.
C. Netted against other investment gains and losses and recorded as part of other income.
D. Included in the cumulative-effect adjustment to retained earnings.

22. Not-for-profit organizations may apply the provisions of ASC 825-10-25, Financial Instruments: Overall (FAS-159, The Fair Value Option for Financial Assets and Financial Liabilities) subject to which of the following changes?

A. Reference to the income statement should be replaced with reference to the statement of activities.
B. References to earnings should be replaced with references to the balance sheet.
C. Reference to the statement of changes in net assets should be replaced with changes in the balance sheet.
D. Reference to the statement of cash flows should be replaced with changes in the statement of cash activities.

23. An entity is most likely to account for an asset retirement obligation by

A. Recognizing a liability equal to the sum of the net undiscounted future cash flows associated with the asset retirement obligation.
B. Recognizing the fair value of the liability when it is incurred.
C. Decreasing the carrying amount of the related long-lived asset.

D. Decreasing the liability for the asset retirement obligation to reflect the interest (accretion) expense.

24. The expected cash flow approach to measuring present value promulgated by Statement of Financial Accounting Concepts (SFAC) No. 7, Cash Flow Information and Present Value in Accounting Measurements uses a single set of estimated cash flows.

A. Is limited to assets and liabilities with contractual cash flows.
B. Focuses on explicit assumptions about the range of expected cash flows and their respective probabilities.
C. Focuses on the single most likely amount or best estimate.
D. Uses a single set of estimated cash flows.

Glossary

Active Market: an active market for an asset or liability is a market in which transactions for the asset or liability occur with sufficient frequency and volume to provide pricing information on an ongoing basis.

Black-Scholes-Merton Model: A model used to determine the value of option securities prices based on the relationship between six variables—the current underlying asset price, the option strike price, the option time-to-expiration, the riskless return, the underlying asset payout return, and the underlying asset volatility—work together to determine the value of a standard option.

Cost Approach: a valuation technique that is based on the amount that would be required to replace an asset's service capability (current replacement cost).

Entry Price: the price paid to acquire an asset or received to assume a liability in an exchange transaction.

Exit Price: the price that would be received to sell an asset or paid to transfer a liability.

Expected Cash Flow: the sum of probability-weighted amounts in a range of possible estimated amounts; the estimated mean or average.

Fair Value Hierarchy :the priority of valuation techniques to be used to determine fair value into three broad levels.

Fair Value: the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Financial Asset: cash, evidence of an ownership interest in an entity, or a contract.

Financial Liability: a contract that imposes on one entity a contractual obligation to deliver cash or another financial instrument to a second entity or to exchange other financial instruments on potentially unfavorable terms with the second entity.

Firm Commitment: an agreement with an unrelated party, binding on both parties and usually legally enforceable.

Highest and Best Use: In broad terms, the use of an asset by market participants that would maximize the value of the asset or the group of assets within which the asset would be used.

Income Approach: a valuation technique used to convert future amounts (e.g., profits, cash flows) to a present value amount.

Lattice-Based Model: an option pricing model that divides the time from the option's grant date to the expiration date into small increments.

Market Approach: a valuation tool that use prices for market transactions for identical or comparable assets or liabilities.

Market Participants: buyers and sellers in the principal (or most advantageous) market for the asset or liability that have all of the following characteristics:

a. Independent of the reporting entity (that is, they are not related parties)

b. Knowledgeable, having a reasonable understanding about the asset or liability and the transaction based on all available information, including information that might be obtained through due diligence efforts that are usual and customary

c. Able to transact for the asset or liability

d. Willing to transact for the asset or liability (that is, they are motivated but not forced or otherwise compelled to do so).

Matrix Pricing: a mathematical method used primarily to value debt securities without solely relying on quoted prices for the particular securities.

Most Advantageous Market: the market in which the reporting entity would sell an asset or transfer a liability with the price that maximizes the amount that would be received for the asset or minimizes the amount that would be paid to transfer the liability, considering transaction costs in the respective market(s). The most advantageous market (and thus, market participants) should be considered from the perspective of the reporting entity, thereby allowing for differences between and among entities with different activities.

Nonperformance Risk : the risk that the obligation will not be fulfilled and affects the value at which the liability is transferred. Nonperformance risk includes but may not be limited to the reporting entity’s own credit risk.

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Appendix – Present Value Tables

TABLE 1

THE PRESENT VALUE OF $1.00

(DISCOUNTED AMOUNT OF $1.00) = T1 (i.n)

Periods	2%	4%	6%	8%	10%	12%	14%
1	0.980	0.962	0.943	0.926	0.909	0.893	0.877
2	0.961	0.925	0.890	0.857	0.826	0.797	0.769
3	0.942	0.889	0.840	0.794	0.751	0.712	0.675
4	0.924	0.855	0.792	0.735	0.683	0.636	0.592
5	0.906	0.822	0.747	0.681	0.621	0.567	0.519
6	0.888	0.790	0.705	0.630	0.564	0.507	0.456
7	0.871	0.760	0.665	0.583	0.513	0.452	0.400
8	0.853	0.731	0.627	0.540	0.467	0.404	0.351
9	0.837	0.703	0.592	0.500	0.424	0.361	0.308
10	0.820	0.676	0.558	0.463	0.386	0.322	0.270
11	0.804	0.650	0.527	0.429	0.350	0.287	0.237
12	0.788	0.625	0.497	0.397	0.319	0.257	0.208
13	0.773	0.601	0.469	0.368	0.290	0.229	0.182
14	0.758	0.577	0.442	0.340	0.263	0.205	0.160
15	0.743	0.555	0.417	0.315	0.239	0.183	0.140
16	0.728	0.534	0.394	0.292	0.218	0.163	0.123
17	0.714	0.513	0.371	0.270	0.198	0.146	0.108
18	0.700	0.494	0.350	0.250	0.180	0.130	0.095
19	0.686	0.475	0.331	0.232	0.164	0.116	0.083
20	0.673	0.456	0.312	0.215	0.149	0.104	0.073
21	0.660	0.439	0.294	0.199	0.135	0.093	0.064
22	0.647	0.422	0.278	0.184	0.123	0.083	0.056
23	0.634	0.406	0.262	0.170	0.112	0.074	0.049
24	0.622	0.390	0.247	0.158	0.102	0.066	0.043
25	0.610	0.375	0.233	0.146	0.092	0.059	0.038
26	0.598	0.361	0.220	0.135	0.084	0.053	0.033
27	0.586	0.347	0.207	0.125	0.076	0.047	0.029
28	0.574	0.333	0.196	0.116	0.069	0.042	0.026
29	0.563	0.321	0.185	0.107	0.063	0.037	0.022
30	0.552	0.308	0.174	0.099	0.057	0.033	0.020
31	0.541	0.296	0.164	0.092	0.052	0.030	0.017
32	0.531	0.285	0.155	0.085	0.047	0.027	0.015
33	0.520	0.274	0.146	0.079	0.043	0.024	0.013
34	0.510	0.264	0.138	0.073	0.039	0.021	0.012

35	0.500	0.253	0.130	0.068	0.036	0.019	0.010
36	0.490	0.244	0.123	0.063	0.032	0.017	0.009
37	0.481	0.234	0.116	0.058	0.029	0.015	0.008
38	0.471	0.225	0.109	0.054	0.027	0.013	0.007
39	0.462	0.217	0.103	0.050	0.024	0.012	0.006
40	0.453	0.208	0.097	0.046	0.022	0.011	0.005

TABLE 2

THE PRESENT VALUE OF AN ORDINARY ANNUITY OF $1.00

(DISCOUNTED AMOUNT OF AN ORDINARY ANNUITY OF $1.00)= T2(i,n)

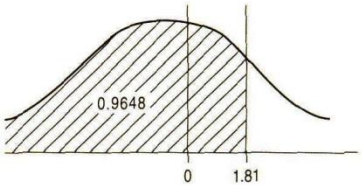
Periods	2%	4%	6%	8%	10%	12%	14%
1	0.980	0.962	0.943	0.926	0.909	0.893	0.877
2	1.942	1.886	1.833	1.783	1.736	1.690	1.647
3	2.884	2.775	2.673	2.577	2.487	2.402	2.322
4	3.808	3.630	3.465	3.312	3.170	3.037	2.914
5	4.713	4.452	4.212	3.993	3.791	3.605	3.433
6	5.601	5.242	4.917	4.623	4.355	4.111	3.889
7	6.472	6.002	5.582	5.206	4.868	4.564	4.288
8	7.325	6.733	6.210	5.747	5.335	4.968	4.639
9	8.162	7.435	6.802	6.247	5.759	5.328	4.946
10	8.983	8.111	7.360	6.710	6.145	5.650	5.216
11	9.787	8.760	7.887	7.139	6.495	5.938	5.453
12	10.575	9.385	8.384	7.536	6.814	6.194	5.660
13	11.348	9.986	8.853	7.904	7.103	6.424	5.842
14	12.106	10.563	9.295	8.244	7.367	6.628	6.002
15	12.849	11.118	9.712	8.559	7.606	6.811	6.142
16	13.578	11.652	10.106	8.851	7.824	6.974	6.265
17	14.292	12.166	10.477	9.122	8.022	7.120	6.373
18	14.992	12.659	10.828	9.372	8.201	7.250	6.467
19	15.678	13.134	11.158	9.604	8.365	7.366	6.550
20	16.351	13.590	11.470	9.818	8.514	7.469	6.623
21	17.011	14.029	11.764	10.017	8.649	7.562	6.687
22	17.658	14.451	12.042	10.201	8.772	7.645	6.743
23	18.292	14.857	12.303	10.371	8.883	7.718	6.792
24	18.914	15.247	12.550	10.529	8.985	7.784	6.835
25	19.523	15.622	12.783	10.675	9.077	7.843	6.873
26	20.121	15.983	13.003	10.810	9.161	7.896	6.906
27	20.707	16.330	13.211	10.935	9.237	7.943	6.935
28	21.281	16.663	13.406	11.051	9.307	7.984	6.961
29	21.844	16.984	13.591	11.158	9.370	8.022	6.983
30	22.396	17.292	13.765	11.258	9.427	8.055	7.003
31	22.938	17.588	13.929	11.350	9.479	8.085	7.020
32	23.468	17.874	14.084	11.435	9.526	8.112	7.035
33	23.989	18.148	14.230	11.514	9.569	8.135	7.048

34	24.499	18.411	14.368	11.587	9.609	8.157	7.060
35	24.999	18.665	14.498	11.655	9.644	8.176	7.070
36	25.489	18.908	14.621	11.717	9.677	8.192	7.079
37	25.969	19.143	14.737	11.775	9.706	8.208	7.087
38	26.441	19.368	14.846	11.829	9.733	8.221	7.094
39	26.903	19.584	14.949	11.879	9.757	8.233	7.100
40	27.355	19.793	15.046	11.925	9.779	8.244	7.105

TABLE 3

NORMAL DISTRIBUTION TABLE

Area under the normal curve



Z	0	1	2	3	4	5	6	7	8	9
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7703	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9278	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9430	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9648	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9700	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9762	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9874	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9990	0.9993	0.9995	0.9997	0.9998	0.9998	0.9999	0.9999	1.0000

Appendix: Annual Reports - Sample Fair Value Disclosures

Marathon Oil 2008 Annual Report

17. Fair Value Measurements

As defined in SFAS No. 157, (ASC 820-10), fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. SFAS No. 157 describes three approaches to measuring the fair value of assets and liabilities: the market approach, the income approach and the cost approach, each of which includes multiple valuation techniques. The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities. The income approach uses valuation techniques to measure fair value by converting future amounts, such as cash flows or earnings, into a single present value amount using current market expectations about those future amounts. The cost approach is based on the amount that would currently be required to replace the service capacity of an asset. This is often referred to as current replacement cost. The cost approach assumes that the fair value would not exceed what it would cost a market participant to acquire or construct a substitute asset of comparable utility, adjusted for obsolescence.

SFAS No. 157 does not prescribe which valuation technique should be used when measuring fair value and does not prioritize among the techniques. SFAS No. 157 establishes a fair value hierarchy that prioritizes the inputs used in applying the various valuation techniques. Inputs broadly refer to the assumptions that market participants use to make pricing decisions, including assumptions about risk. Level 1 inputs are given the highest priority in the fair value hierarchy while Level 3 inputs are given the lowest priority. The three levels of the fair value hierarchy are as follows.

- Level 1—Observable inputs that reflect unadjusted quoted prices for identical assets or liabilities in active markets as of the reporting date. Active markets are those in which transactions for the asset or liability occur in sufficient frequency and volume to provide pricing information on an ongoing basis.

- Level 2—Observable market-based inputs or unobservable inputs that are corroborated by market data. These are inputs other than quoted prices in active markets included in Level 1, which are either directly or indirectly observable as of the reporting date.

- Level 3—Unobservable inputs that are not corroborated by market data and may be used with internally developed methodologies that result in management's best estimate of fair value.

We use a market or income approach for recurring fair value measurements and endeavor to use the

best information available. Accordingly, valuation techniques that maximize the use of observable inputs are favored. Financial assets and liabilities are classified in their entirety based on the lowest priority level of input that is significant to the fair value measurement. The assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the placement of assets and liabilities within the levels of the fair value hierarchy.

The following table presents net financial assets and liabilities accounted for at fair value on a recurring basis as of December 31, 2008:

(In millions)	*Level 1*	*Level 2*	*Level 3*	*Level 4*
Derivative instruments:				
Commodity	$107	$ 6	$(55)	$58
Interest rate	–	–	29	29
Foreign currency	–	(75)	–	(75)
Total derivative instruments	107	(69)	(26)	12
Other assets	2	–	–	2
Total at fair value	$109	$(69)	$(26)	$14

Deposits of $121 million in broker accounts covered by master netting agreements are included in fair values of commodity derivatives. Derivatives in Level 1 are exchange-traded contracts for crude oil, natural gas, refined products and ethanol measured at fair value with a market approach using the close-of-day settlement prices for the market. Derivatives in Level 2 are measured at fair value with a market approach using broker quotes or third-party pricing services, which have been corroborated with data from active markets. Level 3 derivatives are measured at fair value using either a market or income approach. Generally at least one input is unobservable, such as the use of an internally generated model or an external data source.

Commodity derivatives in Level 3 include a $72 million liability related to two U.K. natural gas sales contracts that are accounted for as derivative instruments and a $52 million asset for crude oil options related to sales of Canadian synthetic crude oil. The fair value of the U.K. natural gas contracts is measured with an income approach by applying the difference between the contract price and the U.K. forward natural gas strip price to the expected sales volumes for the shorter of the remaining contract term or 18 months. These contracts originated in the early 1990s and expire in September 2009. The contract prices are reset annually in October based on the previous twelve-month changes in a basket of energy and other indices. Consequently, the prices under these contracts do not track forward natural gas prices. The crude oil options, which expire December 2009, are measured at fair value using a Black-Scholes option pricing model, an income approach that utilizes prices from an active market and market volatility calculated by a third-party service.

The interest rate derivatives are measured at fair value using quotes from our counterparties which are compared to internal calculations made using rates posted by a pricing service. Because we are unable to independently verify those rates directly to the market, such inputs are considered Level 3.

The following is a reconciliation of the net beginning and ending balances recorded for derivative instruments classified as Level 3 in the fair value hierarchy.

(In millions)	*December 31, 2008*
Beginning balance	
Total realized and unrealized losses:	$(355)
Included in net income	210
Included in other comprehensive income	1
Purchases, sales, issuances and settlements, net	118
Ending balance	$ (26)

The change in unrealized losses included in net income related to instruments held at December 31, 2008, was an addition of $299 million for 2008. Amounts reported in net income are classified as sales and other operating revenues or cost of revenues for commodity derivative instruments, as net interest and other financing income for interest rate derivative instruments and as cost of revenues for foreign currency derivatives, except those designated as hedges of future capital expenditures. Amounts related to foreign currency derivatives designated as hedges of future capital expenditures accumulate in other comprehensive income and are amortized to depletion, depreciation and amortization over the life of the capital asset.

The following table summarizes financial instruments, excluding the derivative financial instruments reported above, by individual balance sheet line item at December 31, 2008 and 2011.

	December 31,			
	2008		*2007*	
(In millions)	*Fair Value*	*Carrying Amount*	*Fair Value*	*Carrying Amount*
Financial assets				
Receivables from United States Steel, including current portion	$ 438	$ 492	$ 500	$ 507
Other noncurrent assets(a)	286	113	1,140	899
Total financial assets	724	605	1,640	1,406
Financial liabilities				

Long-term debt, including current portion(b)	5,683	6,880	7,176	6,947
Total financial liabilities	$5,683	$6,880	$7,176	$6,947

(a)

(b)

Our current assets and liabilities accounts contain financial instruments, the most significant of which are trade accounts receivables and payables. We believe the carrying values of our current assets and liabilities approximate fair value, with the exception of the current portion of receivables from United States Steel and the current portion of our long-term debt which is reported above. Our fair value assessment incorporates a variety of considerations, including (1) the short-term duration of the instruments (e.g., less than 1 percent of our trade receivables and payables are outstanding for greater than 90 days), (2) our investment-grade credit rating, and (3) our historical incurrence of and expected future insignificance of bad debt expense, which includes an evaluation of counterparty credit risk.

The fair value of the receivables from United States Steel is measured using an income approach that discounts the future expected payments over the remaining term of the obligations. Because this asset is not publicly-traded and not easily transferable, a hypothetical market based upon United States Steel's borrowing rate curve is assumed and the majority of inputs to the calculation are Level 3. The industrial revenue bonds are to be redeemed on or before the tenth anniversary of the USX Separation per the Financial Matters Agreement.

The majority of our restricted cash represent cash accounts that earn interest; therefore, the balance approximates fair value. Other financial assets included in our other noncurrent assets line include cost method investments and miscellaneous long-term receivables or deposits. Fair value for the cost method investments is measured using an income approach. Estimated future cash flows, obtained from our internal forecasts or forecasts from the partially owned companies, are discounted to obtain the fair value.

Over 90 percent of our long-term debt instruments are publicly-traded. A market approach, based upon quotes from major financial institutions is used to measure the fair value of such debt. Because these quotes cannot be independently verified to the market they are considered Level 3 inputs. The fair value of our debt that is not publicly-traded is measured using an income approach. The future debt service payments are discounted using the rate at which we currently expect to borrow. All inputs to this calculation are Level 3.

Long-term receivables and deposits are also measured using an income approach. The expected

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(a) Includes restricted cash, cost method investments and miscellaneous long-term receivables or deposits.

(b) Excludes capital leases.

timing of payments are scheduled and then discounted using a rate deemed appropriate.

16. Fair Value Measurement

	Fair Value Measurements at October 2, 2010			
Description	**Level 1**	**Level 2**	**Level 3**	**Total**
Assets				
Investments	$ 42	$ 42	$ 2	$ 86
Derivatives [(1)]				
Interest rate	—	231	—	231
Foreign exchange	—	404	—	404
Residual Interests	—	—	54	54
Liabilities				
Derivatives [(1)]				
Interest rate	—	(22)	—	(22)
Foreign exchange	—	(490)	—	(490)
Other derivatives	—	—	—	—
Other	—	—	(1)	(1)
Total	$ 42	$ 165	$ 55	$ 262

Fair value is defined as the amount that would be received for selling an asset or paid to transfer a liability in an orderly transaction between market participants and requires that assets and liabilities carried at fair value be classified and disclosed in the following three categories:

- Level 1 – Quoted prices for identical instruments in active markets

- Level 2 – Quoted prices for similar instruments in active markets; quoted prices for identical or

similar instruments in markets that are not active; and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets

- Level 3 – Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable

The Company's assets and liabilities measured at fair value on a recurring basis are summarized in the following table by the type of inputs applicable to the fair value measurements.

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(1) The Company has a master netting arrangements by counterparty with respect to certain derivative contracts. Contracts in a liability position totaling $206 million have been netted against contracts in an asset position in the Consolidated Balance Sheet.

The fair value of Level 2 investments is primarily determined by reference to market prices based on recent trading activity and other relevant information including pricing for similar securities as determined by third-party pricing services.

The fair values of Level 2 derivatives, which consist of interest rate and foreign currency hedges, are primarily determined based on the present value of future cash flows using internal models that use observable inputs such as interest rates, yield curves and foreign currency exchange rates. Counterparty credit risk, which is mitigated by master netting agreements and collateral posting arrangements with certain counterparties, did not have a material impact on derivative fair value estimates.

Level 3 residual interests consist of our residual interests in securitized vacation ownership mortgage receivables and are valued using a discounted cash flow model that considers estimated interest rates, discount rates, prepayment, and defaults. There were no material changes in the residual interests in fiscal 2010.

The Company also has assets and liabilities that are required to be recorded at fair value on a non-recurring basis when certain circumstances occur. During fiscal 2010, the Company recorded impairment charges of $249 million on film productions which are reported in "Costs and expenses" in the Consolidated Statement of Income. The film impairment charges compared our estimated fair value using discounted cash flows, which is a level 3 input, to the unamortized cost of the films that had aggregate carrying values of $591 million prior to the impairment.

Fair Value of Financial Instruments

In addition to the financial instruments listed above, the Company's financial instruments also include cash, cash equivalents, receivables, accounts payable and borrowings.

The fair values of cash and cash equivalents, receivables, available-for-sale investments, derivative contracts and accounts payable approximated the carrying values. The estimated year end fair values of the Company's total borrowings (current and noncurrent) subject to fair value disclosures, determined based on broker quotes or quoted market prices or interest rates for the same or similar instruments are $13.7 billion and $12.6 billion at October 2, 2010 and October 3, 2009, respectively.

Transfers of Financial Assets

Through December 4, 2008, the Company sold mortgage receivables arising from the sales of its vacation ownership units under a facility that expired on December 4, 2008 and was not renewed. The Company sold $17 million and $147 million of mortgage receivables during the years ended October 3, 2009, and September 27, 2008, respectively. These sales of mortgage receivables resulted in gains on securitized sales of vacation ownership interests totaled $4 million and $32 million for fiscal 2009 and fiscal 2008, respectively.

The Company continues to service the sold receivables and has a residual interest in those receivables. As of October 2, 2010, the outstanding principal amount for sold mortgage receivables was $309 million and the carrying value of the Company's residual interest, which is recorded in other long-term assets, was $54 million.

The Company repurchases defaulted mortgage receivables at their outstanding balance. The Company did not make material repurchases in the years ended October 2, 2010 or October 3, 2009. The Company generally has been able to sell the repurchased vacation ownership units for amounts that exceed the amounts at which they were repurchased.

The Company also provides credit support for up to 70% of the outstanding balance of the sold mortgage receivables which the mortgage receivable acquirer may draw on in the event of losses under the facility. The Company maintains a reserve for estimated credit losses related to these receivables.

Credit Concentrations

The Company continually monitors its positions with, and the credit quality of, the financial institutions that are counterparties to its financial instruments and does not anticipate nonperformance by the counterparties. In 2008, Lehman Brothers Commercial Corporation defaulted on a $91 million trade settlement. The Company is pursuing collection of this amount, but has fully reserved the amount.

The Company does not expect that it would realize a material loss, based on the fair value of its derivative financial instruments as of October 2, 2010, in the event of nonperformance by any single

derivative counterparty. The Company enters into transactions only with derivative counterparties that have a credit rating of A- or better. The Company's current policy regarding agreements with derivative counterparties is generally to require collateral in the event credit ratings fall below A- or in the event aggregate exposures exceed limits as defined by contract. In addition, the Company limits the amount of investment credit exposure with any one institution.

The Company does not have material cash and cash equivalent balances with financial institutions that have a credit rating of less than A-. As of October 2, 2010, the Company's balances that exceeded 10% of cash and cash equivalents with individual financial institutions were 30% compared to 38% as of October 3, 2009.

The Company's trade receivables and financial investments do not represent a significant concentration of credit risk at October 2, 2010 due to the wide variety of customers and markets into which the Company's products are sold, their dispersion across geographic areas, and the diversification of the Company's portfolio among issuers.

Review Question Answers

Review Questions – Section 1

1. The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date is which of the following?

A. Incorrect. Cost is the original amount paid for an asset.

B. Incorrect. Entry price is the price that would be paid to buy an asset or received to acquire a liability.

C. **Correct.** Fair value is defined in ASC 820-10, Fair Value Measurements and Disclosures: Overall (FAS-157, Fair Value Measurements) and ASC 825-10-25, Financial Instruments: Overall (FAS-159, The Fair Value Option for Financial Assets and Financial Liabilities) as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Thus, this is the exit price.

D. Incorrect. Cost plus transaction fees is the total amount that would be paid to acquire an asset. It should be noted that transaction fees for the most part are expensed and not reported on the balance sheet.

2. According to SFAC 7, Using Cash Flow Information and Present Value in Accounting Measurements, the objective of present value when used to determine an accounting measurement for initial recognition purposes is to

A. **Correct.** SFAC 7 states that the only objective of present value in an initial recognition or fresh-start measurement is to estimate fair value. In other words, "present value should attempt to capture the elements that taken together would comprise a market price if one existed, that is, fair value." A present value measurement includes five elements: estimates of cash flows, expectations about their variability, the time value of money, the price of uncertainty inherent in an asset or liability, and other factors (e.g., illiquidity or market imperfections). Fair value encompasses all these elements using the estimates and expectations of participants in the market.

B. Incorrect. Entity-specific measurements are based on the entity's assumptions, for example, about the use of a given asset, rather than those that would be made by participants in the market.

C. Incorrect. An effective settlement measurement (the current assets needed to be invested today at a given interest rate to generate future cash inflows to match future cash outflows for a liability) excludes the price components related to uncertainty and the entity's credit standing. Parties that hold an entity's liabilities consider its credit standing when determining the prices they will pay.

D. Incorrect. Value-in-use measurements are based on assumptions made by a company or other entity, with unique scenarios which may not reflect the true fair value estimates and expectation of market participants.

3. According to ASC 820-10, Fair Value Measurements and Disclosures: Overall (FAS-157, Fair Value Measurements), fair value is

A. Incorrect. An entry price is what is paid or received in an orderly exchange to acquire an asset or assume a liability, respectively.
B. Incorrect. Fair value is an exit price paid or received in a hypothetical transaction considered from the perspective of a market participant.
C. **Correct.** Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Thus, fair value is an exit price.
D. Incorrect. Fair value is market-based, not entity-specific. It is based on pricing assumptions of market participants.

4. For the purpose of a fair value measurement of an asset or liability, a transaction is assumed to occur in the

A. Incorrect. If no principal market exists, the transaction is assumed to occur in the most advantageous market.
B. **Correct.** For fair value measurement purposes, a transaction is assumed to occur in the principal market for an asset or liability if one exists. The principal market has the greatest volume or level of activity. If no such market exists, the transaction is assumed to occur in the most advantageous market.
C. Incorrect. The principal market is not necessarily the most advantageous market.
D. Incorrect. No election of the reporting entity is allowed. The principal market must be used.

5. In the absence of quoted prices for identical or similar assets or liabilities, fair value may NOT be estimated using which of the following valuation techniques?

A. Incorrect. Use of the market approach may be allowed. Under the market approach, prices for market transactions for identical or comparable assets or liabilities are used.
B. **Correct.** The entry approach would assume an entry price rather than an exit price for valuation, which would not be appropriate when determining fair value. Entry price is the price paid to acquire an asset or received to assume a liability in an exchange transaction.

C. Incorrect. The income approach is allowed. Under the income approach, valuation techniques are used to convert future amounts (e.g., profits, cash flows) to a present value amount.

D. Incorrect. The cost approach is allowed. It is based on the amount that currently would be required to replace the service capacity of an asset (often referred to as current replacement cost).

6. Valuation techniques for fair value measurement must use

A. Incorrect. The entity may use the cost approach (based on current replacement cost, which is the cost to a market participant to buy or build an asset of comparable utility adjusted for obsolescence).

B. Incorrect. Unobservable inputs are based on the entity's own assumptions about the assumptions of market participants that reflect the best available information in the circumstances. They should be minimized but are allowable in proper circumstances.

C. Incorrect. The market and income approaches also may be used.

D. **Correct.** Inputs to valuation techniques are the pricing assumptions of market participants. The assumptions include those about the risk of a given technique or its inputs.

7. Fair value measurement of an asset or liability is based on a fair value hierarchy that establishes priorities among inputs to valuation techniques. According to the hierarchy,

A. **Correct.** The level of the fair value measurement depends on the lowest level input significant to the entire fair value measurement. Level 1 inputs are unadjusted quoted prices in active markets for identical assets (liabilities) that the entity can access at the measurement date. An adjustment for new information results in a lower level fair value measurement.

B. Incorrect. Observable inputs that are not Level 1 quoted prices are on Level 2. Examples are quoted prices for similar items in active markets and quoted prices in markets that are not active.

C. Incorrect. Level 3 inputs are unobservable. They are used in the absence of observable inputs and should be based on the best available information in the circumstances.

D. Incorrect. Quoted prices for items similar (not identical) to the asset or liability are on Level 2.

8. Fair value measurements of assets and liabilities are based on transactions between market participants at the measurement date. Market participants

A. Incorrect. Market participants need not be specifically identified. Instead, the entity must identify their general characteristics, with consideration of factors specific to (1) the asset or liability, (2) the market, and (3) parties with whom the entity would deal.

B. **Correct.** Market participants are not related parties. They are independent of the reporting entity. They also are knowledgeable and willing and able (but not compelled) to engage in transactions involving the asset or liability.

C. Incorrect. Market participants must be independent of the entity.

D. Incorrect. Market participants do not include parties who engage in forced or liquidation sales or are otherwise compelled to act.

9. The fair value measurement of an asset

A. **Correct.** The fair value measurement is based on the highest and best use by market participants. This use maximizes the value of the asset. The highest and best use is in-use if the value-maximizing use is in combination with other assets in a group. An example is machinery. The highest and best use is in-exchange if the value-maximizing use is as a standalone asset. An example is a financial asset.

B. Incorrect. The fair value measurement of a liability, not an asset, assumes transfer without settlement.

C. Incorrect. The fair value measurement assumes use by market participants.

D. Incorrect. The fair value measurement of a liability includes nonperformance risk. An element of nonperformance risk is the entity's own credit risk (credit standing).

10. In the hierarchy for fair valuation process, which of the following levels would be observable market inputs other than quoted prices for identical assets or liabilities?

A. Incorrect. Level 1 inputs are observable market inputs that reflect quoted prices for identical assets or liabilities in active markets the reporting entity has the ability to access at the measurement date.

B. **Correct.** Level 2 inputs are observable market inputs other than quoted prices for identical assets or liabilities such as: 1) Quoted prices for similar assets and liabilities in active markets; 2) Quoted prices for identical or similar assets and liabilities in markets that are not active; or 3) Market inputs other than quoted prices that ate directly observable for the asset or liability, such as interest rates, yield curves, volatilities, and default rates.

C. Incorrect. Level 3 inputs are unobservable market inputs, such as those derived through extrapolation or interpolation that are not able to be validated by observable market data.

D. Incorrect. The fair value hierarchy only has three levels of inputs.

Review Questions – Section 2

11. A commercial entity should record unrealized gains and losses as a result of reporting at fair value at each reporting date:

A. Incorrect. The equity section of the balance sheet would not be the appropriate place to record gains and losses. This section defines the net worth (or equity) of an entity.
B. Incorrect. Long-term liabilities is reserved for liabilities that are payable in the long term (one year or more). Although the gains and losses are unrealized, this would not be the appropriate place to record them.
C. **Correct.** Gains and losses should be recorded in earnings (or changes in net assets) as well as where those gains or losses are presented in the financial statements.
D. Incorrect. The mezzanine section of the balance sheet is reported after liabilities and before equities. This would not be the appropriate place to report gains and losses even if they are unrealized.

12. The reporting entity may elect the fair value option for

A. Incorrect. An investment in a subsidiary required to be consolidated is not an eligible item.
B. Incorrect. The primary beneficiary must consolidate the variable interest entity. Thus, the interest in the variable interest entity is not an eligible item.
C. **Correct.** An entity may elect the fair value option for (1) most recognized financial assets and liabilities, (2) otherwise unrecordable firm commitments that involve only financial instruments, (3) a written loan commitment, (4) insurance contracts and warranties that are not financial instruments (because they require or permit settlement in goods or services instead of cash settlement) but permit payment to a third party to provide goods or services, and (5) a host instrument that is part of a nonfinancial instrument and is accounted for separately from an embedded nonfinancial derivative.
D. Incorrect. Items eligible for the fair value option election do not include employers' and plans' obligations for (1) employee pension benefits, (2) other postretirement employee benefits, (3) postemployment benefits, (4) employee stock option and stock purchase plans, and (5) other deferred compensation.

13. According to ASC 825-10-25, Financial Instruments: Overall (FAS-159, The Fair Value Option for Financial Assets and Financial Liabilities), election of the fair value option

A. Incorrect. The fair value option may be elected by all entities.
B. Incorrect. Upfront costs and fees are recognized in earnings of a business as they are incurred if they relate to eligible items for which the fair value option election was made.

C. **Correct.** A business measures at fair value the eligible items for which the fair value option election was made at a specified election date. The unrealized gains and losses on those items are reported in earnings at each subsequent reporting date.

D. Incorrect. The unrealized gains and losses are recognized in earnings, not other comprehensive income.

14. The decision whether to elect the fair value option

A. Incorrect. The fair value option is irrevocable (except if a new election date occurs) and is applied solely to entire instruments (not portions of those instruments or specified risks or specific cash flows).

B. **Correct.** The decision whether to elect the fair value option is final and cannot be revoked unless a new election date occurs. For example, an election date occurs when an entity recognizes an investment in equity securities with readily determinable fair values issued by another entity. A second election date occurs when the accounting changes because the investment later becomes subject to equity-method accounting. An original decision to classify the equity securities as available-for-sale may then be revoked at the second election date by choosing the fair value option, instead of the equity method.

C. Incorrect. The decision whether to elect the fair value option may be applied to individual eligible items. Thus, identical items may be treated differently. However, certain exceptions apply. For example, the fair value option may be applied to an investment to which the equity method would otherwise apply. This election must be applied to all financial interests held by the investor in the investee that are eligible items.

D. Incorrect. With certain exceptions (e.g., multiple advances to one debtor under a single construction loan that merge into a larger balance), the fair value option need not be applied to all eligible items acquired or issued in the same transaction. For example, an acquirer of registered bonds may apply the fair value option to only some of the bonds.

15. An entity may elect the fair value option for an event requiring (1) initial recognition of eligible items or (2) measurement of an eligible item at fair value when the event occurs but not at subsequent reporting dates. Such events include:

A. Incorrect. The date of a business combination is an election date.

B. Incorrect. The date of consolidation is an election date.

C. **Correct.** An election date for the fair value option includes the date of an event requiring fair value measurement when it occurs but not subsequently (excluding recognition of impairment, e.g., of inventory or long-lived assets). Examples of events requiring either remeasurement at fair value or initial recognition of eligible items and that result in an election date are (1) a business combination, (2) a consolidation or deconsolidation, or (3) a significant modification of debt. A consolidation requires an initial recognition in the

consolidated statements of eligible items on the books of the subsidiary but not measurement of those items at fair value. A business combination involves an initial recognition of the assets acquired and liabilities assumed, with measurement at fair value. However, an investment in a subsidiary required to be consolidated is not itself an item eligible for the fair value option.

D. Incorrect. Both the dates of a consolidation and a business are election dates for a fair value option.

16. The fair value option is NOT allowed for which of the following financial assets and liabilities?

A. Incorrect. A firm commitment that would otherwise not be recognized at inception and that involves only financial instruments is eligible for fair value valuation. A firm commitment is an agreement with an unrelated party, binding on both parties and usually legally enforceable, with two characteristics: 1) The agreement specifies all significant terms, including the quantity to be exchanged, a fixed price, and the timing of the transaction. The fixed price may be expressed as a specified amount of an entity's functional currency or of a foreign currency. It may also be expressed as a specified interest rate or specified effective yield; and 2)The agreement includes a disincentive for nonperformance that is sufficiently large to make performance probable.

B. Incorrect. A forward purchase contract for a loan that is not readily convertible to cash is an example of a firm commitment. The commitment involves only financial instruments (a loan and cash) and would not be recognized because it is not a derivative instrument.

C. Incorrect. A written loan commitment (i.e., a note payable such as a mortgage or credit line note) is allowed to be valued at fair value.

D. **Correct.** Employers' and plans' obligations (or assets from net overfunded positions) for pension benefits, other postretirement benefits, postemployment benefits, employee stock option and stock purchase plans, and other forms of deferred compensation arrangements are not allowed to be valued at fair value.

17. Which of the following is an election date for the purpose of determining whether to elect the fair value option?

A. Incorrect. An election date occurs when the accounting changes because the investment becomes subject to equity-method accounting, not when the investment no longer is subject to equity-method accounting.

B. **Correct.** An entity may choose the fair value option only on an election date. For example, an election date occurs when the accounting for an equity investment in another entity changes because the investor retains an interest but no longer consolidates a subsidiary or a variable interest entity.

C. Incorrect. A firm commitment is not an eligible item unless it involves financial instruments only.

D. Incorrect. An election date occurs when an event requires an eligible item to be measured at fair value at the time of the event but not subsequently. However, an exception to this rule is recognition of impairment for a nontemporary impairment. Another situation in which no election date occurs is recognition of impairment when writing down inventory to the lower of cost or market.

18. Bing Company has three mortgage notes payable. Which of the following is correct as it relates to Bing's ability to use the fair value option?

A. Incorrect. ASC 825-10-25 (FAS-159) permits use of the fair value option on an instrument-by-instrument basis. Thus, Bing may use it for one note but not necessarily all notes.

B. Incorrect. The fair value option is available to any financial instrument. Therefore, it may be used for notes payable. There is no requirement that the fair value option be applied to all instruments issued or acquired in a single transaction except for multiple advances and investments accounted for under the equity method.

C. **Correct.** The fair value option applies to notes payable. The company may elect to choose the option for any or all of its notes payable.

D. Incorrect. The option may be used whether the notes are discounted or not. With respect to notes payable that have below-market interest rates, a company may choose to elect fair value treatment in a rising interest rate environment during which the note value would be written down and unrealized gains recorded on the income statement. However, once interest rates fall, the unrealized gains would also reverse creating unrealized losses on the income statement. The entity would not be allowed to rescind the election.

19. Which of the following is NOT an event on which an entity may choose to elect the fair value option for an eligible item?

A. Incorrect. One of the events identified by ASC 825-10-25 (FAS-159) is that the entity first recognizes the eligible item. This is actually the preferable time to make the option, so that the asset or liability is consistently reported from its inception.

B. Incorrect. ASC 825-10-25 (FAS-159) provides that an election may be made when the entity enters into an eligible firm commitment. At this point, the entity is considered to have rights to and therefore control of the asset or liability and may record the transaction for reporting purposes.

C. **Correct.** There is no provision that allows an election at each anniversary date of the effective date. If that were the case, a company could annually decide whether it was more advantageous to value at cost or fair value depending on how it would affect its reported profit.

D. Incorrect. One of the allowed election dates is when the accounting treatment for an investment in another entity changes because the investment becomes subject to the equity method of accounting or the investor ceases to consolidate a subsidiary or variable interest entity. Where the entity may have at one time not been able to elect the option (for example if the asset was a subsidiary which required consolidation), because of new events the entity may now choose the option.

Review Section 3

20. Which of the following is the correct way to report assets and liabilities on the balance sheet under the fair value option?

A. **Correct.** One presentation approach is to show the balance sheet item as two separate line items for fair value and non-fair value carrying amounts. The other approach is to report them as one line item, but clearly note what dollar amount of that reported is measured at fair value.
B. Incorrect. ASC 825-10-25 (FAS-159) does not allow for the netting on the balance sheet. Rather, it states that an entity shall report its assets and liabilities that are subsequently measured at fair value in a manner that separates those reported fair values from the carrying amounts measured differently.
C. Incorrect. ASC 825-10-25 (FAS-159) does not allow for presenting a separate fair value mezzanine section. The assets and liabilities which are reported at fair value must still be reported in the appropriate balance sheet section.
D. Incorrect. The fair value option does not limit the presentation of an asset or liability to the long-term section of the balance sheet. Most entities will have both long- and short-term items that are measured at fair value.

21. If the fair value option is elected for available-for-sale or held-to-maturity securities, which of the following is correct as it relates to cumulative unrealized gains and losses at the effective date? They are:

A. Incorrect. At the time of the election, the gain or loss is part of the cumulative effect adjustment, which is not part of income from continuing operations.
B. Incorrect. Up to the election date, the gain or loss is included as part of other comprehensive income. At the election date, the gain or loss is removed from other comprehensive income and recorded as part of the cumulative effect but disclosed separately from unrecognized unrealized gains and losses.
C. Incorrect. There is no requirement that the gain or loss be netted against other investment gains and losses and recorded as part of other income.

D. **Correct.** The gains or losses that were included in other comprehensive income are included in the cumulative-effect adjustment to retained earnings.

22. Not-for-profit organizations may apply the provisions of ASC 825-10-25, Financial Instruments: Overall (FAS-159, The Fair Value Option for Financial Assets and Financial Liabilities) subject to which of the following changes?

A. **Correct.** Reference to the income statement should be replaced with reference to ASC 825-10-25 (FAS-159) of activities, statement of changes in net assets, or statement of operations.
B. Incorrect. References to earnings should be replaced with references to changes in net assets and not the balance sheet.
C. Incorrect. The balance sheet is not a financial statement of a not-for-profit organization and should not be referenced as such.
D. Incorrect. ASC 825-10-25 (FAS-159) is silent on replacement of the statement of cash flows for not-for-profit organizations.

23. An entity is most likely to account for an asset retirement obligation by

A. Incorrect. If a quoted market price in an active market or the price of a similar liability is not available, a present value method may be used to estimate fair value. Ordinarily, the expected cash flow method described in Statement of Financial Accounting Concepts (SFAC) No. 7, Using Cash Flow Information and Present Value in Accounting is the only suitable present value method. Hence, probability-weighted present values, not undiscounted amounts, may be used to measure the asset retirement obligation.
B. **Correct.** The fair value of the asset retirement obligation liability is recognized when incurred. If a reasonable estimate of the fair value cannot be made at that time, the asset retirement obligation will be recognized when such an estimate can be made. Fair value is the amount at which the asset retirement obligation could be settled in a current transaction between willing parties, not in a forced or liquidation transaction. A quoted price in an active market is the best evidence of fair value. If such a price is not available, the best available information is used, such as the price of a similar liability or the result of applying present value methods.
C. Incorrect. The associated asset retirement cost is added (debited) to the carrying amount of the tangible long-lived asset when the asset retirement obligation is recognized (credited).
D. Incorrect. Interest (accretion) expense is debited when the asset retirement obligation is credited to reflect its increase due to passage of time.

24. The expected cash flow approach to measuring present value promulgated by Statement of Financial Accounting Concepts (SFAC) No. 7, Cash Flow Information and Present Value in Accounting Measurements uses a single set of estimated cash flows.

A. Incorrect. The expected cash flow approach may also apply when the timing of cash flows is uncertain or when nonfinancial assets and liabilities are to be measured and no market or comparable item exists for them.

B. **Correct.** The traditional approach to calculating present value employs one set of estimated cash flows and one interest rate. This approach is expected to continue to be used in many cases, for example, when contractual cash flows are involved. However, SFAC 7 describes the expected cash flow approach, which is applicable in more complex circumstances, such as when no market or no comparable item exists for an asset or liability. The expected cash flow results from multiplying each possible estimated amount by its probability and adding the products. The expected cash flow approach emphasizes explicit assumptions about the possible estimated cash flows and their probabilities. The traditional method merely includes those uncertainties in the choice of interest rate. Moreover, by allowing for a range of possibilities, the expected cash flow method permits the use of present value when the timing of cash flows is uncertain.

C. Incorrect. Some current accounting applications use the estimated mode (single most likely amount or best estimate), but the expected cash flow approach arrives at an estimated mean by probabilistically weighting a range of possible estimated amounts.

D. Incorrect. The traditional present value measurement approach uses a single set of estimated cash flows and a single interest rate.