

ACCOUNTING FOR THE EFFECTS OF CHANGING PRICES

LEARNING OBJECTIVES

1. Understand the distinction between changes in the general level of prices in an economy, which affect the purchasing power of the measuring unit, and changes in the prices of specific assets and liabilities, which affect balance sheet valuations and income measurement.
2. Restate conventional financial statements based on historical costs to a common measuring unit.
3. Revalue conventional financial statements to current market values.
4. Prepare financial statements based on current market values and a common measuring unit.

The conventional accounting model, with exceptions for items such as marketable securities and financial instruments, reports assets and related expenses at historical cost. Inventories and fixed assets appear at acquisition cost on the balance sheet, and then, later, some allocated portion of this acquisition cost appears on the income statement when firms sell or use the assets. The conventional accounting model also uses the dollar or other currency to measure historical cost amounts over time on the presumption that the currency reflects a common measuring unit—that is, one dollar spent yesterday and one dollar spent today reflect equal sacrifices of purchasing power. Changing prices, either for specific assets and liabilities or in general across the broad market basket of goods and services in an economy, cause distortions in the measurement of earnings and financial position. When prices change only a bit, GAAP tolerate these distortions either because the distortions lack materiality or because accountants worry about injecting subjectivity into the financial reporting process if they adjust for changing prices.

Prices seldom remain stable. Changes in supply and demand resulting from new technologies, demographic shifts, consumer tastes and other factors cause market values to change. Even relatively small annual changes in prices can cumulate over time, resulting in serious distortions in the financial statements. We present below three approaches to incorporating the effects of changing prices in the financial statements.

Generally accepted accounting principles (GAAP) in the United States do not currently require firms to prepare their financial statements under any of these three alternatives to the conventional accounting model. The International Accounting Standards Committee (IASC) recommends the disclosure of certain information about changing prices. GAAP in countries that have experienced significant inflation require firms to restate their financial statements under one or a combination of the three approaches.

IMPACT OF CHANGING PRICES ON THE CONVENTIONAL FINANCIAL STATEMENTS

Changing prices affect financial reports in two principal ways:

1. *Measuring unit problem.* Changes in the *general* level of prices in an economy (as measured by the prices of a broad basket of goods and services) affect the purchasing power of the monetary unit (for example, the U.S. dollar). During periods of inflation (deflation), the measuring unit loses (gains) purchasing power. Because the measuring unit does not reflect a constant amount of purchasing power over time, accounting measurements of assets, liabilities, revenues, and expenses made with this measuring unit are not comparable over time. Adding the acquisition cost of land acquired 10 years ago for \$10 million to the acquisition cost of land acquired this year for \$10 million is as inappropriate as adding the cost of land acquired in the United States for \$10 million to the cost of land acquired by a subsidiary in the United Kingdom (U.K.) for £10 million. We refer to the accounting issues created by changes in the general level of prices as a *measuring unit problem*.

2. *Valuation problem.* Changes in the *specific* prices of individual assets and liabilities (for example, inventories or fixed assets) affect the measurement of revenues and expenses on the income statement and the valuation of assets and liabilities on the balance sheet. Land acquired last year for \$10 million may now have a market value of \$14 million. Should the accountant report this land on the balance sheet at its acquisition cost of \$10 million or at its current market value of \$14 million? Should net income (or other comprehensive income) include an unrealized holding gain of \$4 million? We refer to the accounting issues created by changes in the prices of specific assets and liabilities as a *valuation problem*.

To summarize:

1. Financial reporting can use either a *nominal* measuring unit (that is, one that gives no recognition to the changing value of the measuring unit) or a *constant* measuring unit (that is, one that restates measurements made over time to reflect a constant measuring unit).
2. Financial reporting can use either *acquisition cost* valuations or *current (replacement) cost* valuations for assets and liabilities; changes in current cost valuations over time affect the measurement of net income and shareholders' equity.

Combining alternative measuring units and alternative valuation methods presents four possible treatments of the effects of changing prices:

1. Acquisition Cost/Nominal Dollar Accounting
2. Acquisition Cost/Constant Dollar Accounting
3. Current Cost/Nominal Dollar Accounting
4. Current Cost/Constant Dollar Accounting

We will illustrate each of these four combinations using a simple example. Exhibit 1 summarizes the data used in the illustration.

EXHIBIT 1

DATA FOR INFLATION ACCOUNTING ILLUSTRATION

Balance Sheet as of Jan. 1, Year 1

Cash \$400
Common Stock. . . \$400

Other Information:

Date:	January 1, Year 1	June 30, Year 1	December 31, Year 1
CPI	200	210 (5% increase)	231 (10% increase)
Cost of One Widget	\$100	\$115	\$140
Cost of Equipment	\$100	\$110	\$120
Transactions	1. Buy 2 widgets at \$100 each, \$200 2. Purchase equipment (5 yr. life) for \$100	1. Sell 1 widget for \$240; replace widget at \$115 2. Pay other expenses of \$100	Close books and prepare statements

A firm begins its first year of operations, Year 1, by issuing common stock for \$400. On January 1, Year 1, the Consumer Price Index (CPI) is 200. The firm immediately acquires two widgets for \$100 each and a piece of equipment for \$100. During the first six months of Year 1, general prices increase by 5 percent, so the CPI increases from 200 to 210. On June 30, Year 1, the firm sells one widget for \$240 and replaces it at the new higher replacement cost of \$115. The firm also pays other expenses totaling \$100 on June 30, Year 1. During the second six months of the year, general prices increase by another 10 percent (the CPI increases from 210 to $210 \times 1.10 = 231$). On December 31, Year 1, the replacement cost of the widget is \$140 and the replacement cost of the equipment in new condition is \$120.

Financial statements prepared under each of the four combinations of measuring units and valuation methods appear in Exhibit 2. The sections below discuss each of these approaches to accounting for changing prices.

ACQUISITION COST/NOMINAL DOLLAR ACCOUNTING

Column 1 of Exhibit 2 shows the results for Year 1 as they would appear in the conventional financial statements prepared in the United States and most other countries. These financial statements give no explicit consideration to the effects of changing prices, either in general or for specific assets and liabilities.

Sales appear at the nominal dollars received when the firm sold the widget on June 30. Other expenses appear at the nominal dollars expended on June 30. Cost of goods sold, depreciation, and equipment reflect the nominal dollars spent on January 1. Inventories on the balance sheet reflect the nominal dollars spent on January 1 and June 30. Thus, the financial statements use a measuring unit of unequal size (purchasing power).

Likewise, the financial statements do not reflect the increase in the replacement cost of the inventory and the equipment during Year 1. Given that the firm must replace the widget at a higher current cost, is the firm better off by the \$20 of net income? Is \$20 of depreciation a sufficient measure of the cost of the equipment used during Year 1? Given that the firm held inventories and equipment while their replacement costs increased, might the firm be better off by more than the \$20 of net income?

One might justify the use of nominal dollars as the measuring unit when the rate of general price inflation is relatively low (for example, less than 5 percent per year). The rapid turnover of assets for most businesses will not result in serious distortions in financial statement measurements. The use of a last-in, first-out cost flow assumption for cost of goods sold and accelerated depreciation for fixed assets provides at least a partial solution to the problems created by changes in specific prices. These accounting principles provide measures of expenses that approximate current replacement costs, although they provide asset valuations that can deviate widely from current costs.

ACQUISITION COST/CONSTANT DOLLAR ACCOUNTING

Acquisition cost/constant dollar accounting states all financial statement amounts in dollars of uniform purchasing power to obtain a constant, or uniform, measuring unit. The accountant restates the actual, or nominal, dollars received or spent over time to an equivalent number of dollars on some constant dollar date. For example, consider the equipment acquired on January 1 for \$100. The acquisition cost amount reflects a sacrifice of \$100 of January 1 purchasing power. We might restate that sacrifice in purchasing power in several ways.

1. The purchasing power of 100 January 1 dollars is equivalent to 50 base-year dollars.¹
 $\$100 \times (100/200) = \50.00 of base-year purchasing power
2. The purchasing power of 100 January 1 dollars is equivalent to 105 June 30 dollars.
 $\$100 \times (210/200) = \105 of June 30 purchasing power
3. The purchasing power of 100 January 1 dollars is equivalent to 115.50 December 31 dollars.
 $\$100 \times (231/200) = \115.50 of December 31 purchasing power

Using the letter C before the dollar sign to denote constant dollars, we can write the following equation:

$$C\$_{\text{Base}}50 = C\$_{1/1}100 = C\$_{6/30}105 = C\$_{12/31}115.50$$

These four amounts reflect equal amounts of purchasing power and are therefore economically equivalent. We could use any of these four constant dollar dates to restate the nominal-dollar financial statements to constant-dollar amounts. We use December 31 constant dollars in the illustrations below.

Note that the acquisition cost/constant dollar amounts do not reflect the market prices of individual assets. The market value of the inventory, for example, increased 15 percent [= $(\$115/\$100) - 1$] during the

¹Common terminology refers to the *base year* as the year for which a price index is 100. Because rates of change in price indices matter, not their absolute amounts, the choice of a base year has little economic or accounting substance.

first six months of Year 1, and the market value of the equipment increased 10 percent [= $(\$110/100) - 1$] during this period. The general price level as measured by the CPI increased only 5 percent. Acquisition cost/constant dollar accounting deals with a measuring unit problem and not with current market values of individual assets and liabilities.

RESTATEMENT OF MONETARY AND NONMONETARY ITEMS

Constant-dollar accounting makes an important distinction between monetary items and nonmonetary items.

Monetary Items A *monetary item* is a claim receivable or payment in a specified number of dollars, regardless of changes in the purchasing power of the dollar. Monetary items include the following: cash; accounts, notes, and interest receivable; accounts, notes, bonds and interest payable; and income taxes payable. Firms settle monetary items (that is, collect receivables or pay payables) in a specified number of dollars and not in terms of a given amount of purchasing power. Holding monetary items over time while the purchasing power of the dollar changes gives rise to *purchasing power (or monetary) gains and losses*. During a period of inflation, holders of monetary assets lose purchasing power. The dollars received at collection of an accounts receivable have smaller purchasing power than the dollars the firm would have received had it received the cash at the time of sale. Likewise, holders of monetary liabilities gain purchasing power. The dollars spent to settle an accounts payable have smaller purchasing power than the dollars the firm would have spent had it paid cash at the time of initial purchase. Constant-dollar accounting includes the purchasing-power gain or loss on holdings of net monetary items in earnings each period. The conventional accounting model using nominal dollars ignores this gain or loss in purchasing power when measuring earnings.

Conceptual Note Firms that lend to others usually understand the risk of loss in purchasing power. To compensate for their potential loss in purchasing power during periods of expected inflation, lenders incorporate the expected rate of inflation into the interest rate charged on loans. The interest revenue from loans offset the purchasing power that lenders lose during inflation. In parallel, sellers of goods and services on account increase the selling price to compensate for the expected purchasing power lost between the time of sale to customers and the later time of cash collection. The conventional accounting model includes the interest revenue and sales revenue in earnings but excludes the offsetting purchasing-power loss.

Nonmonetary Items A *nonmonetary item* is any asset, liability, or shareholders' equity account that has no claim to or for a specified number of dollars. That is, if an item is not a monetary item, it must be nonmonetary. Examples of nonmonetary items are inventory, land, buildings, equipment, common stock, revenues, and expenses. Nonmonetary items appear in the conventional, nominal-dollar financial statements at varying amounts of purchasing power. The purchasing power of these amounts depends on when the firm acquired nonmonetary assets, incurred nonmonetary liabilities, or received nonmonetary shareholders' equities. Acquisition cost/constant dollar accounting restates each nonmonetary item to an equivalent number of dollars on the constant-dollar date. The amount of the restatement does not represent a gain or loss but merely equalizes the measuring unit.

ILLUSTRATION OF THE RESTATEMENT PROCEDURE

Column 2 of Exhibit 2 shows financial statements restated to dollars of constant general purchasing power. Acquisition cost valuations still underlie the measurement of revenues, expenses, assets, and liabilities. However, we restate the nominal dollars underlying these measurements to dollars of constant purchasing power at the end of Year 1. The restatement might use other constant-dollar measuring units (for example, January 1, Year 1, constant dollars or June 30, Year 1, constant dollars).

Income Statement The firm originally measured sales revenue in June 30, Year 1, dollars. The restatement expresses the \$240 of sales revenue in terms of dollars of December 31, Year 1, purchasing power. Likewise, cost of goods sold, depreciation, and other expenses reflect restatements of nominal-dollar, acquisition-cost valuations to dollars of constant December 31, Year 1, purchasing power. Thus, the amounts in column 2 use an equivalent measuring unit.

Column 2 also shows the purchasing-power gain or loss on monetary items. The firm held \$100 of cash, its only monetary item, during the first six months of the year while the general purchasing power of the dollar decreased 5 percent. It therefore lost \$5 in terms of dollars of June 30, Year 1, purchasing power. Measured

in dollars of December 31, Year 1, constant dollars, the purchasing-power loss for the first six months of Year 1 is \$5.50. The firm held \$125 of cash during the second six months of the year. With 10 percent inflation during this six-month period, an additional loss in purchasing power of \$12.50 occurs. Note *e* of Exhibit 2 shows the calculations for this simple illustration.

In most cases, firms have several monetary assets and monetary liabilities. Calculating the purchasing-power gain or loss following the procedure in note *e* becomes unwieldy in such circumstances. Exhibit 3 presents the calculations in a more useful format for firms with many monetary accounts. The first column shows the beginning and ending net monetary position of the firm, as well as the inflows and outflows that caused the net monetary position to change during the period. The only monetary item for this firm is cash. The net monetary position on January 1 is zero because the firm had not yet commenced business. Its monetary position on December 31 is its cash of \$125. Thus, net monetary assets increased \$125 during the year. The first column shows the various inflows and outflows of monetary items that explain this net increase of \$125. The firm issued common stock for cash, increasing net monetary assets. The firm also sold a widget for cash. Note, though, that the sale of the widget on account would also have increased net monetary assets because accounts receivable is a monetary item. The collection of an accounts receivable results in no net change in the monetary asset position; cash increases and accounts receivable decreases. Net monetary assets decreased when the firm purchased inventory and equipment and paid other expenses. The amounts in column 1 appear in dollars of varying purchasing power. Column 3 restates the nominal-dollar amounts in column 1 to an equivalent number of December 31 dollars. Thus, the amounts in column 3 all use a common measuring unit. If the firm had maintained the purchasing power of the monetary inflows and outflows during the year, it would have had \$143 of net monetary assets on December 31. It actually had a net monetary asset position of only \$125. Thus, the firm lost \$18 (= 143 – \$125) of purchasing power during the year.

Procedural Note A common error in calculating the purchasing-power gain or loss results from neglecting transactions that caused monetary items to change during the period. The starting point calculates the net monetary position at the beginning and the end of the year in column 1 from the acquisition cost/nominal dollar balance sheet. The next step identifies the inflows and outflows that explain the net change during the period. This step usually requires searching through the transactions of the period. Do not start the restatement to constant dollars until you have fully explained the change in the net monetary position in nominal dollars.

EXHIBIT 3

CALCULATION OF PURCHASING-POWER GAIN OR LOSS

	Acquisition Cost/ Nominal Dollars	Restatement	Acquisition Cost/ Constant Dollars
Net Monetary Assets Position, January 1	—		—
Increases in Net Monetary Assets:			
Issue of Common Stock on January 1	\$400	231/200	C\$462.00
Sale of Widget on June 30	240	231/210	264.00
Decreases in Net Monetary Assets:			
Purchase of 2 Widgets on January 1	(200)	231/200	(231.00)
Purchase of Equipment on January 1	(100)	231/200	(115.50)
Purchase of 1 Widget on June 30	(115)	231/210	(126.50)
Payment of Other Expenses on June 30	(100)	231/210	(110.00)
Net Monetary Asset Position, December 31	<u>\$125</u>		<u>C\$143.00</u>
Purchasing-Power Loss: \$125 – C\$143 = C\$18			

Balance Sheet Cash is the only monetary item on the balance sheet. It appears in both column 1 (nominal dollars) and column 2 (constant December 31 dollars) at \$125. The restatements for inventories, equipment, accumulated depreciation, and contributed capital reflect the cumulative changes in the CPI since the firm acquired the assets or issued the capital stock. Restated retained earnings in this case equal restated net income for the year because the firm commenced operation this year and did not declare or pay dividends.

Evaluation of Acquisition Cost/Constant Dollar Accounting

When compared with current-cost accounting (discussed next), constant-dollar accounting carries a higher level of objectivity. Independent accountants can examine canceled checks, invoices, and other documents to verify acquisition-cost valuations and transaction dates. The restatements to constant dollars use general price indexes published by governmental bodies.

Constant-dollar financial statements do not reflect the current cost of individual assets and liabilities. Also, the firm is not necessarily better or worse off in an amount equal to the purchasing-power gain or loss on monetary items. Because lenders and borrowers incorporate the *expected* rate of inflation into the interest rate charged for delayed payments, purchasing-power gains should offset interest expense, and purchasing-power losses should offset interest revenue. Whether a firm is better or worse off depends on the *actual* rate of inflation relative to the expected rate incorporated into the interest rate.

CURRENT COST/NOMINAL DOLLAR ACCOUNTING

Current-cost accounting tries to report all amounts in terms of current market values. The accountant might use the current cost of replacing various goods and services, referred to as *current replacement cost*. Alternatively, the accountant might use the net amount a firm would receive if it sold or settled the item, an amount referred to as *net realizable value*. Column 3 of Exhibit 2 reports amounts in terms of the current replacement cost of specific assets, liabilities, revenues, and expenses.

Income Statement

Sales revenue equals the amount of cash received from the sale of inventory items, the same as in the conventional financial statements. The matching expenses are the current costs both of replacement of the widget sold and of the services of the equipment used. The firm sold the widget on June 30, when its replacement cost was \$115. The average replacement cost of the equipment during the year was \$110. Assuming that the firm used the equipment evenly throughout the year, the replacement cost of the services of the equipment used was \$22 ($=\$110/5$). Operating income (sales minus expenses measured at current replacement cost) reports the firm's ability to maintain its operating capacity. If sales revenue is not large enough to cover the cost of replacing goods and services used up, the firm will have to cut back its level of operations (unless it secures outside financing).

Current cost income also separately reports *holding gains and losses*, both *realized and unrealized*. (The conventional, acquisition-cost income statement includes realized holding gains but generally does not disclose them separately. See the discussion in Chapter 7.) A holding gain or loss arises from holding an asset (or liability) while its replacement cost changes. The firm held the widget purchased on January 1, Year 1, for \$100 during the first six months of the year while its replacement cost increased to \$115. When the firm sold the widget on June 30, it realized a holding gain of \$15 ($= \$115 - \100). Likewise, the firm earned unrealized holding gains on the two widgets in ending inventory: \$40 ($= \$140 - \100) on the other widget acquired on January 1 and \$25 ($= \$140 - \115) on the widget acquired on June 30, for a total unrealized holding gain of \$65 ($= \$40 + \25). The firm had similar realized and unrealized holding gains on the equipment.

Do holding gains constitute an increase in the value of a firm? Those who say "yes" argue that firms purchasing assets early in anticipation of increases in replacement costs are better off than firms delaying purchases and consequently paying the later, higher replacement costs. Those who say "no" argue that firms cannot use such holding gains as the basis for dividend payments without impairing the ability to replace those assets used or sold.

Balance Sheet

Cash appears at its face amount in the current cost balance sheet. Inventory and equipment, both nonmonetary items, appear at their current replacement cost on December 31. Any changes in the replacement cost of assets and liabilities accrue to the common shareholders. Rather than allocate this change in value between the Common Stock and Retained Earnings accounts, Exhibit 2 states common stock at its initial issue price and allocates all changes in replacement costs to earnings and retained earnings.

Evaluation of Current Cost/Nominal Dollar Accounting

Current-cost accounting measures performance and financial position in terms of the current market prices. Managers likely make decisions (for example, pricing or asset replacement) in terms of current costs, not

out-of-date acquisition costs. Thus, for assessing management's actions, current-cost financial statements provide information on the same basis that management used to make decisions.

Critics note two shortcomings of current cost/nominal dollar accounting:

- First, auditors cannot as easily verify current-replacement-cost valuations as they can acquisition-cost valuations. Different appraisers will likely provide different replacement-cost valuations for various assets. Particularly large variations in appraisal values can occur for assets that do not trade in active secondhand markets.
- Second, the use of nominal dollars means that the measuring unit underlying current-replacement-cost valuations varies across time. Revenues and expenses reflect the purchasing power of the monetary unit during the year, whereas assets and liabilities reflect year-end purchasing power. Distortions caused by changes in the general purchasing power of the measuring unit are less severe in current cost/nominal dollar accounting than in acquisition cost/nominal dollar accounting because current replacement costs reflect more recent measurements.

CURRENT COST/CONSTANT DOLLAR ACCOUNTING

Current cost/constant dollar accounting reports in a constant measuring unit the current cost of assets, liabilities, revenues, and expenses. Column 4 of Exhibit 2 shows the financial statements in current cost/constant dollar terms.

Income Statement

Column 3 measures sales, cost of goods sold, and other expenses in terms of replacement costs on June 30, Year 1. Column 4 restates these amounts from dollars of June 30 purchasing power to dollars of December 31 purchasing power.

The holding gains in column 4 merit special attention. The amounts reported there indicate the extent to which changes in prices of the firm's specific assets exceed (or fall short of) the change in the general price level. Economists refer to such holding gains (or losses) as *real holding gains and losses*. (In this context, *real* contrasts with *nominal*.) The current replacement cost of both inventories and equipment increased at a faster rate than the CPI during the year. The realized and unrealized holding gains in column 3 report the nominal holding gains. The realized and unrealized holding gains in column 4 reduce these nominal holding gains for the change in the purchasing power of the dollar during the year. If the current replacement cost of either the inventory or the equipment had increased less rapidly than the CPI, the nominal holding gains in column 3 would appear as constant-dollar holding *losses* in column 4. Column 4 also includes the purchasing-power gain on monetary items.

Balance Sheet

The valuation of assets at current replacement cost on December 31 automatically states them in constant December 31 dollars. Common stock appears in constant December 31 dollars, not the January 1 dollars received when the firm issued the stock.

Evaluation of Current Cost/Constant Dollar Accounting

Current cost/constant dollar accounting deals with both accounting problems caused by changing prices: the measuring unit problem and the valuation problem. Although current cost/constant dollar accounting provides a comprehensive solution to these problems, the user of financial statements based on this approach should keep in mind the concerns discussed previously: (1) current-cost valuations are less objective than acquisition-cost valuations, (2) the firm is not necessarily better or worse off in an amount equal to the purchasing-power gain or loss on monetary items, and (3) the firm cannot distribute to shareholders an amount equal to the holding gains on nonmonetary items (for example inventories or equipment) if it is to maintain its operating capacity.

EXHIBIT 2

ILLUSTRATION OF FINANCIAL STATEMENTS REFLECTING INFLATION ACCOUNTING

	(1) Acquisition Cost/ Nominal Dollars		(2) Acquisition Cost/ Constant Dollars		(3) Current Cost/ Nominal Dollars		(4) Current Cost/ Constant Dollars	
Income Statement								
Sales		\$240		C\$264.0 ^a		\$240		C\$264.0
Cost of Goods Sold	\$100		115.5 ^b		115		126.5 ⁿ	
Depreciation	20		23.1 ^c		22 ⁱ		24.2 ^o	
Other Expenses	100	220	110.0 ^d	248.6	100	237	110.0 ^d	260.7
Operating Income		\$ 20		C\$ 15.4		\$ 3		C\$ 3.3
Realized Holding Gains:								
Goods Sold		—		—		15 ^j		11.0 ^p
Depreciable Assets Used		—		—		2 ^k		1.1 ^q
Unrealized Holding Gains:								
Inventory		—		—		65 ^l		38.0 ^r
Depreciable Assets		—		—		16 ^m		3.6 ^s
Purchasing Power Loss		—		(18.0) ^e		—		(18.0) ^e
Net Income/Loss		<u>\$ 20</u>		<u>C\$ (2.6)</u>		<u>\$101</u>		<u>C\$ 39.0</u>
Balance Sheet								
Cash		\$125		C\$125.0		\$125		C\$125
Inventory		215		242.0 ^f		280		280
Equipment	\$100		C\$115.5 ^g		\$120		C\$120	
Accumulated Depreciation	(20)	80	(23.1)	92.4	(24)	96	(24)	96
Total Assets		<u>\$420</u>		<u>C\$459.4</u>		<u>\$501</u>		<u>C\$501</u>
Common Stock		\$400		C\$462.0 ^h		\$400		C\$462 ^h
Retained Earnings		20		(2.6)		101		39
Total Equity		<u>\$420</u>		<u>C\$459.4</u>		<u>\$501</u>		<u>C\$501</u>

^a\$240 × (231/210) = C\$264.0

^e\$100 × (231/200) = \$115.5

^m\$96 – \$80 = \$16

^b\$100 × (231/200) = C\$115.5

^h\$400 × (231/200) = \$462

ⁿ\$115 × (231/210) = C\$126.5

^c\$100 × (231/200) = C\$115.5; \$115.5/5 = C\$23.1

^l\$110/5 = \$22

^o\$22 × (231/210) = C\$24.2

^d\$100 × (231/210) = C\$110

^j\$115 – \$100 = \$15

^pC\$126.5 – C\$115.5 = C\$11

^e[\$100 × (10/200) × (231/210)] +

^k\$22 – \$20 = \$2

^qC\$24.2 – C\$23.1 = C\$1.1

\$125 × (21/210) = C\$5.50 + C\$12.50 = C\$18

ⁱ\$280 – \$215 = \$65

^rC\$280 – C\$242 = C\$38

^f\$100 × (231/200) + \$115 × (231/210) = C\$242

^sC\$96 – C\$92.4 = C\$3.6

PROBLEM FOR SELF-STUDY

The Whitmyer Corporation commenced operations on January 1 to conduct an office rental business. Transactions during the year, with the assumed values of the CPI at the time of each transaction, appear below.

1. January 1 (CPI = 200). Issued common stock at par value, \$1,000,000.
2. January 1 (CPI = 200). Acquired land costing \$100,000 and a building costing \$1,500,000. The firm paid \$900,000 in cash and borrowed the remainder of the purchase price on a long-term mortgage. The loan requires the payment of interest on December 31 of each year at 10 percent and the repayment of principal in 10 years.
3. January 1 to December 31 (average CPI = 212). Collects rentals totaling \$300,000.
4. January 1 to December 31 (average CPI = 212). Incurs operating costs totaling \$60,000, of which it pays \$40,000 in cash and the remainder on account. All of these operating costs are expenses for the year.
5. January 1 to December 31 (average CPI = 212). Accrues interest costs on the mortgage liability.
6. December 31 (CPI = 224). Pays the interest due on the mortgage.
7. December 31 (CPI = 224). Recognizes depreciation on the building using the straight-line method, a 30-year life, and zero salvage value.
8. December 31 (CPI = 224). Declares and pays a cash dividends of \$75,000.

The current cost of the land on December 31 is \$150,000. The current cost of a similar building in new condition on December 31 is \$1,560,000. The current cost of a similar one-year-old building on December 31 is \$1,508,000. The amounts reported as operating and interest expenses in the conventional financial statements closely approximate their average current costs during the year.

Prepare an income statement for the current year and a balance sheet as of December 31 for Whitmyer Corporation under each of the following (round all amounts to the nearest dollar):

- a. Acquisition cost/nominal dollars
- b. Acquisition cost/constant dollars of December 31 purchasing power
- c. Current cost/nominal dollars
- d. Current cost/constant dollars of December 31 purchasing power

SUGGESTED SOLUTION TO PROBLEM FOR SELF-STUDY

Exhibit 4 presents income statements and balance sheets for Whitmyer Corporation for the current year. The computations appear in the notes to Exhibit 4 and in Exhibit 5.

EXHIBIT 4WHITMYER CORPORATION
Financial Statements Reflecting Accounting for Changing Prices

	Acquisition Cost/ Nominal Dollars	Acquisition Cost/ Constant Dollars	Current Cost/ Nominal Dollars	Current Cost/ Constant Dollars
Income Statement				
Rent Revenue	\$ 300,000	C\$ 316,981 ^a	\$ 300,000	C\$ 316,981 ^a
Depreciation Expense	(50,000)	(56,000) ^b	(51,000) ^j	(53,887) ^o
Operating Expenses	(60,000)	(63,396) ^c	(60,000)	(63,396) ^c
Interest Expense	<u>(70,000)</u>	<u>(73,962)^d</u>	<u>(70,000)</u>	<u>(73,962)^d</u>
Operating Income	\$ 120,000	C\$ 123,623	\$ 119,000	C\$ 125,736
Realized Holding Gain:				
Building	—	—	1,000 ^k	(2,113) ^p
Unrealized Holding Gain:				
Land	—	—	50,000 ^l	38,000 ^q
Building	—	—	58,000 ^m	(116,000) ^r
Purchasing Power Gain	<u>—</u>	<u>62,377^e</u>	<u>—</u>	<u>62,377^e</u>
Net Income	\$ 120,000	C\$ 186,000	\$ 228,000	C\$ 108,000
Less Dividends Declared	<u>(75,000)</u>	<u>(75,000)</u>	<u>(75,000)</u>	<u>(75,000)</u>
Retained Earnings, December 31	<u>\$ 45,000</u>	<u>C\$ 111,000</u>	<u>\$ 153,000</u>	<u>C\$ 33,000</u>
Balance Sheet				
Assets:				
Cash	\$ 215,000	C\$ 215,000	\$ 215,000	C\$ 215,000
Land	100,000	112,000 ^f	150,000	150,000
Building—Cost	1,500,000	1,680,000 ^g	1,560,000	1,560,000
Less Accumulated Depreciation	<u>(50,000)</u>	<u>(56,000)^h</u>	<u>(52,000)ⁿ</u>	<u>(52,000)</u>
Total Assets	<u>\$1,765,000</u>	<u>C\$1,951,000</u>	<u>\$1,873,000</u>	<u>C\$1,873,000</u>
Liabilities and Shareholders' Equity:				
Accounts Payable	\$20,000	C\$20,000	\$20,000	C\$ 20,000
Note Payable	700,000	700,000	700,000	700,000
Common Stock	1,000,000	1,120,000 ⁱ	1,000,000	1,120,000 ⁱ
Retained Earnings	<u>45,000</u>	<u>111,000</u>	<u>153,000</u>	<u>33,000</u>
Total Equities	<u>\$1,765,000</u>	<u>C\$1,951,000</u>	<u>\$1,873,000</u>	<u>C\$1,873,000</u>

Notes to Exhibit 4:

- ^a\$300,000 × 224/212 = C\$316,981. ^j(\$1,500,000 + \$1,560,000)/2 = \$1,530,000; \$1,530,000/30 = \$51,000.
- ^b\$50,000 × 224/200 = C\$56,000. ^k\$51,000 – \$50,000 = \$1,000.
- ^c\$60,000 × 224/212 = C\$63,396. ^l\$150,000 – \$100,000 = \$50,000.
- ^d\$70,000 × 224/212 = C\$73,962. ^m(\$1,560,000 – \$52,000) – (\$1,500,000 – \$50,000) = \$1,508,000 – \$1,450,000 = \$58,000.
- ^eSee Exhibit 5. ⁿ\$1,560,000/30 = \$52,000
- ^f\$100,000 × 224/200 = C\$112,000. ^o\$51,000 × 224/212 = C\$53,887.
- ^g\$1,500,000 × 224/200 = C\$1,680,000. ^p(\$51,000 × 224/212) – (\$50,000 × 224/200) = C\$53,887 – C\$56,000 = C\$(2,113).
- ^hC\$1,680,000/30 = C\$56,000. ^q\$150,000 – (\$100,000 × 224/200) = C\$150,000 – C\$112,000 = C\$38,000.
- ⁱ\$1,000,000 × 224/200 = C\$1,120,000. ^rC\$1,508,000 – C\$1,624,000 = C\$(116,000).

EXHIBIT 5

WHITMYER CORPORATION
Calculation of Purchasing-Power Gain or Loss for Current Year

	Acquisition Cost/ Nominal Dollars	Restatement	Acquisition Cost/ Constant Dollars
Net Monetary Position, Jan. 1	—	—	—
Increases in Net Monetary Assets:			
Issue of Common Stock for Cash	\$ 1,000,000	224/200	C\$ 1,120,000
Accrual of Rent Receivable	300,000	224/212	316,981
Decreases in Net Monetary Assets:			
Disbursement of Cash in Acquisition of Land and Building	(900,000)	224/200	(1,008,000)
Issuance of Note Payable in Acquisition of Land and Building	(700,000)	224/200	(784,000)
Accrual of Operating Costs	(60,000)	224/212	(63,396)
Accrual of Interest Costs	(70,000)	224/212	(73,962)
Declaration of Dividend	<u>(75,000)</u>	224/224	<u>(75,000)</u>
Net Monetary Liability Position, Dec. 31	<u>\$ (505,000)</u>		<u>C\$ (567,377)</u>

Purchasing-Power Gain: C\$567,377 – C\$505,000 = C\$62,377.

KEY TERMS AND CONCEPTS

Nominal dollars
Constant dollars
Acquisition cost
Current cost
Constant-dollar date
Monetary item
Nonmonetary item
Purchasing-power gain or loss on monetary items
Realized holding gain or loss on nonmonetary items
Unrealized holding gain or loss on nonmonetary items
Holding gains and losses net of inflation

QUESTIONS, EXERCISES, AND PROBLEMS**QUESTIONS**

PRICES 1. Review the meaning of the terms and concepts listed in Key Terms and Concepts.

PRICES 2. Refer to the income statements and balance sheets in Exhibit 2.

- Under what conditions will the amounts in column 1 (acquisition cost/nominal dollars) equal the amounts in column 3 (current cost/nominal dollars)?
- Under what conditions will the amounts in column 2 (acquisition cost/constant dollars) equal the amounts in column 4 (current cost/constant dollars)?
- Under what conditions will the amounts in column 2 (acquisition cost/constant dollars) equal the amounts in column 3 (current cost/nominal dollars)?

PRICES 3. When preparing acquisition cost/constant dollar financial statements, under what conditions will a firm incur

- a purchasing-power gain?
- a purchasing-power loss?
- neither a purchasing-power gain nor a purchasing-power loss?

PRICES 4. Why is there no purchasing-power gain or loss on nonmonetary items in acquisition cost/constant dollar financial statements?

PRICES 5. “Financial statements prepared under the conventional accounting model reflect dollars of mixed purchasing power.” Explain the meaning of this statement in relation to the balance sheet, the income statement, and the statement of cash flows.

PRICES 6. For which types of asset and equity structures would you expect

- a. significant differences between net income as conventionally reported and as restated to a constant-dollar basis (including the purchasing-power gain or loss)?
- b. insignificant differences between the two earnings measures?

PRICES 7. “The amount of income from continuing operations for any given year on an acquisition cost/constant dollar basis will differ depending on the constant-dollar date selected.” Explain.

PRICES 8. “Operating income on a current cost/nominal dollar basis indicates the extent to which a firm maintained its operating capacity during a period.” Explain.

PRICES 9. “All realized holding gains or losses were unrealized holding gains or losses at some time in the past.” Do you agree? Why or why not?

PRICES 10. A firm reports a realized holding gain on land it sold in its current cost/nominal dollar income statement but reports a realized holding loss in its current cost/constant dollar income statement. What is the likely explanation for this difference?

PRICES 11. “The LIFO cost flow assumption for inventories and accelerated depreciation methods for plant and equipment are only partial solutions to the accounting problems associated with specific price changes.” Explain.

EXERCISES

PRICES 12. Calculating the gain on sale of land under various approaches to accounting for changing prices. Rockness Corporation acquired a parcel of land on January 2 for \$50,000. The firm sold the parcel on July 1 of the same year for \$65,000. An index of the general price level and the current cost of the land on various dates follows:

	General Price Index	Current Cost
January 2	160	\$ 50,000
July 1	185	65,000
December 31	200	75,000

Calculate the amount of income or loss relating to this land for the year under each of the following bases (round amounts to the nearest dollar):

- a. Acquisition cost/nominal dollars
- b. Acquisition cost/constant dollars of December 31 purchasing power
- c. Current cost/nominal dollars
- d. Current cost/constant dollars of December 31 purchasing power

PRICES 13. Disaggregating the gross margin into operating margin and holding gains. The merchandise inventory of Scoggin’s Appliance Store on January 1 consists of 1,000 units acquired for \$250 each. During the year, the firm purchased 2,500 units at a unit price of \$300 while it sold 2,400 units for \$400 each. The average current cost per unit during the year is \$300, whereas the current cost on December 31 is \$360 per unit.

- a. Using acquisition cost and nominal dollars, calculate the gross margin (sales minus cost of goods sold) for the year using the FIFO and the LIFO cost flow assumptions.
- b. Using current cost and nominal dollars, disaggregate the gross margin in part a into the operating margin and realized holding gain.

PRICES 14. Restating equipment and depreciation to a constant-dollar basis. Sunder Equipment Corporation depreciates its machinery using the straight-line method over a 10-year life with zero estimated salvage value. It takes a full year's depreciation in the year of acquisition and none in the year of disposal. Acquisitions, which took place evenly over the appropriate years, were as follows: Year 1, \$400,000; Year 2, \$200,000; Year 3, \$300,000. An index of the average general price level during Year 1 was 180, during Year 2 was 220, and during Year 3 was 240. The general price index on December 31, Year 3, is 250.

- a. Calculate the amount of depreciation expense for Year 3 and the book value of the machinery on December 31, Year 3, using the acquisition costs and nominal dollars.
- b. Repeat part **a** using the acquisition costs and constant dollars of December 31, Year 3, purchasing power. Round all amounts to the nearest dollar.

PRICES 15. Calculating the purchasing power-gain or loss. Cunningham Drug Store had a net monetary asset position of \$300,000 on January 1, at which time an index of the general price level was 200. Transactions during the year and associated indices of the general price level (GPI) appear below.

- (1) Purchases, all on account: \$400,000 (GPI = 210).
- (2) Sales, all on account: \$600,000 (GPI = 210).
- (3) Collections from customers for sales on account, \$450,000 (GPI = 215).
- (4) Payments to suppliers for purchases on account, \$300,000 (GPI = 215).
- (5) Declaration of a \$200,000 dividend, payable during January of next year (GPI = 250). The general price index on December 31 is 230.
 - a. Calculate the amount of the purchasing-power gain or loss for the year, stated in terms of constant December 31 dollars. Round all amounts to the nearest dollar.
 - b. Repeat part **a** assuming a net monetary liability position of \$300,000 on January 1.

PRICES 16. Calculating the purchasing power gain or loss. On January 1 the Bill Langston family had \$800 in its checking account and \$4,000 in a savings account. The unpaid balance for the mortgage on their home totaled \$25,000, and unpaid bills relating to purchases during December of last year amounted to \$600. An index of the general price level on January 1 was 210. During the current year, the following transactions occurred (general price index is shown in parentheses):

- (1) Took home a salary of \$25,000 (average GPI = 225).
- (2) Paid bills outstanding on January 1 of \$600 (GPI = 213).
- (3) Made principal payments of \$2,000 on the home mortgage loan (average GPI = 225).
- (4) Incurred food, clothing, interest, and other costs of \$20,500, of which the family paid \$19,700 in cash (average GPI = 225).
- (5) Earned interest, which the bank added to the savings account, totaling \$300 (average GPI = 225).
- (6) In addition to the interest earned in (5), the family transferred \$1,500 from the checking to the savings account (GPI = 158). The general price index on December 31 is 240.

Calculate the family's purchasing-power gain or loss for the year, stated in terms of constant December 31 dollars. Round conversion factors to two decimal places—for example, $240/225 = 1.07$.

PRICES 17. Preparing an income statement and balance sheet under four measurement and valuation approaches. Straus Corporation commenced operations on January 2 with the issuance of common stock for \$200. The following transactions occur during the year.

- (1) January 2. Purchased two widgets for \$50 each.
- (2) January 2. Acquired furniture with a five-year life and zero estimated salvage value for \$50. The firm uses the straight-line depreciation method.
- (3) June 30. Sold one widget for \$120.
- (4) June 30. Purchased one new widget for \$80.
- (5) June 30. Paid other expenses of \$50 in cash.

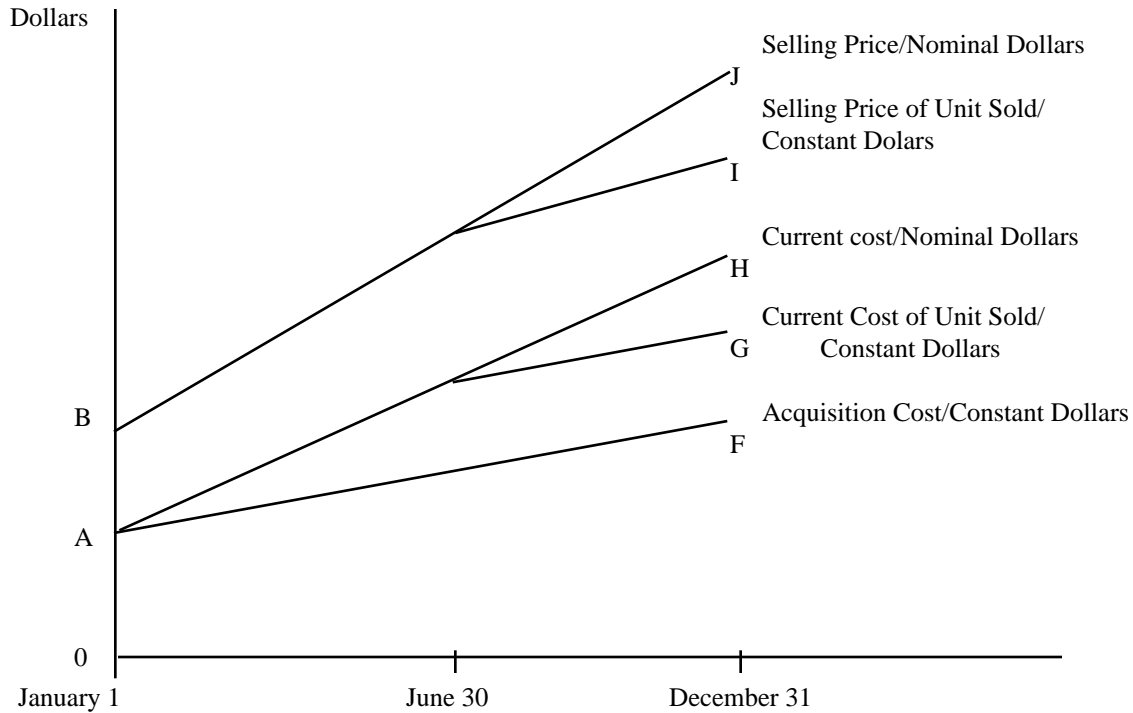
An index of the general price level was 100 on January 1, 120 on June 30, and 132 on December 31. On December 31, the current cost of a widget was \$90. On this same date, the current cost of replacing the furniture in new condition was \$60.

- a. Prepare a four-column income statement and balance sheet as of December 31 for Straus Corporation using the following headings:

- (1) Acquisition cost/nominal dollars
- (2) Acquisition cost/constant dollars of December 31 purchasing power
- (3) Current cost/nominal dollars
- (4) Current cost/constant dollars of December 31 purchasing power

b. How successful was Straus Corporation in coping with inflation during the year?

PRICES 18. Graphical illustration of changing prices relationships. Bulova Corporation acquired two tables on January 1. It sold one of these tables on June 30. The other table remained in inventory on December 31. Figure 1 depicts various selling prices and cost relationships relating to these tables during the year. Point A is the acquisition cost of each table. Using the letters shown in Figure 1, indicate the computation of the following items.



- a. Gross margin on sale in acquisition cost/nominal dollars
- b. Gross margin on sale in acquisition cost/constant dollars of June 30 purchasing power
- c. Gross margin on sale in acquisition cost/constant dollars of December 31 purchasing power
- d. Operating margin before holding gains and losses in current cost/nominal dollars
- e. Realized holding gain in current cost/nominal dollars
- f. Unrealized holding gain in current cost/nominal dollars
- g. Operating margin before holding gains and losses in current cost/constant dollars of June 30 purchasing power
- h. Operating margin before holding gains and losses in current cost/constant dollars of December 31 purchasing power
- i. Realized holding gain or loss in current cost/constant dollars of June 30 purchasing power
- j. Realized holding gain or loss in current cost/constant dollars of December 31 purchasing power
- k. Unrealized holding gain or loss in current cost/constant dollars of December 31 purchasing power

PROBLEMS AND CASES

PRICES 19. Preparing acquisition cost/constant dollar financial statements, Year 1. Exhibits 6 and 7 present the financial statements of Hargrave Corporation for Year 1, its first year of operations. Indices of the general price level on various dates appear below (round dollar amounts to the nearest dollar).

(1) On January 1, Year 1, When the Firm Issued Common Stock	200
(2) When It Acquired Store Equipment	205
(3) When It Acquired Merchandise Inventory	210
(4) When It Made Sales	220
(5) When It Incurred Selling and Administrative Costs	215
(6) On December 31, Year 1	240

- a. Restate the balance sheet on December 31, Year 1, to the general purchasing power of the dollar on December 31, Year 1.
- b. Restate the income statement for Year 1 to the general purchasing power of the dollar on December 31, Year 1. Include a separate calculation of the purchasing-power gain or loss.

EXHIBIT 6

HARGRAVE CORPORATION
Balance Sheet
December 31, Year 1
(Problem 19)

Assets	
Cash	\$ 70,000
Accounts Receivable	200,000
Merchandise Inventory	350,000
Store Equipment	400,000
Less Accumulated Depreciation	<u>(40,000)</u>
Total Assets	<u>\$ 980,000</u>
Equities	
Accounts Payable	\$ 480,000
Common Stock	250,000
Additional Paid-in Capital	50,000
Retained Earnings	<u>200,000</u>
Total Equities	<u>\$ 980,000</u>

EXHIBIT 7

HARGRAVE CORPORATION
Income Statement
For Year 1
(Problem 19)

Sales Revenue	\$ 800,000
Less Expenses:	
Cost of Goods Sold	\$ 450,000
Depreciation Expense	40,000
Selling and Administrative Expenses	<u>110,000</u>
Total Expenses	<u>\$ 600,000</u>
Net Income	<u>\$ 200,000</u>

PRICES 20. Preparing a current-cost financial statement in nominal and constant dollars. Refer to the data for Hargrave Corporation in Problem 19. Assuming the following additional information about current cost for Year 1:

	December 31, Year 1
Merchandise Inventory	\$410,000
Store Equipment (net)	396,000
	For Year 1
Cost of Goods Sold	\$490,000
Depreciation Expense	42,000

- a. Prepare an income statement for Year 1 and a balance sheet as of December 31, Year 1, for Hargrave Corporation in terms of current-cost and nominal dollars.
- b. Repeat part a, but state all amounts in terms of constant December 31, Year 1, dollars. Assume that sales occurred evenly over the year.

PRICES 21. Preparing acquisition cost/constant dollar financial statements, Year 2. The financial statements of Hargrave Corporation (see Problem 19) for Year 1, its second year of operations, are presented in Exhibits 8 and 9.

EXHIBIT 8

HARGRAVE CORPORATION
Balance Sheet
December 31, Year 2
(Problem 21)

Assets	
Cash	\$ 110,000
Accounts Receivable	210,000
Merchandise Inventory (based on FIFO)	500,000
Store Equipment	400,000
Accumulated Depreciation	<u>(80,000)</u>
Total Assets	<u><u>\$1,140,000</u></u>
Equities	
Accounts Payable	\$ 490,000
Common Stock	250,000
Additional Paid-in Capital	50,000
Retained Earnings	<u>350,000</u>
Total Equities	<u><u>\$1,140,000</u></u>

EXHIBIT 9

HARGRAVE CORPORATION
Income Statement for Year 2
(Problem 21)

Sales Revenue	\$1,000,000
Less Expenses:	
Cost of Goods Sold	\$ 550,000
Depreciation Expense	40,000
Selling and Administrative Expenses	<u>150,000</u>
Total Expenses	\$ 740,000
Net Income	<u>\$ 260,000</u>

Indices of the general price level on various dates during Year 2 appear below (round conversion factors to two decimal places—for example, $225/200 = 1.13$).

(1) On January 1, Year 2	240
(2) When the Firm Acquired Merchandise Inventory	245
(3) When It Made Sales	260
(4) When It Incurred Selling and Administrative Costs	255
(5) When It Declared and Paid Dividends	280
(6) On December 31, Year 2	280

- a. Restate the balance sheet on December 31, Year 2, in terms of constant dollars of December 31, Year 2, purchasing power.
- b. Restate the income statement for the year ending December 31, Year 2, in terms of constant dollars of December 31, Year 2, purchasing power. Include a separate calculation of the purchasing-power gain or loss.
- c. Prepare an analysis of changes in retained earnings for the year ending December 31, Year 2, before and after restatement to a constant-dollar basis. The January 1, Year 2, balance in retained earnings, restated to constant dollars of December 31, Year 2, purchasing power, is C\$293,375.

PRICES 22. Interpreting income statements restated for changing prices. Exhibit 10 presents a skeleton four-column income statement under four accounting valuation and measurement bases. Various letters denote lines of these income statements. Using these letters, identify which line or lines on the income statement each of the following cases describes:

- a. A firm wants to know whether its selling prices are sufficiently high to cover the cost of replacing goods and services consumed during the period.
- b. A firm wants to know how much of its conventional net income results from operating advantages in the markets it serves and how much results from acquiring assets prior to increases in their replacement cost.
- c. A firm wants to know whether the costs of replacing its inventory and depreciable assets have increased faster or slower during the current period than changes in the general price level.
- d. A firm's dividend policy is to pay out the maximum dividend without impairing operating capacity. Which item in Exhibit 10 should form the basis for this firm's dividend decisions?
- e. When there have been no changes in either specific or general prices, these net income amounts will be the same.
- f. When specific prices have changed at the same rate as the general price level, these measures of operating income will be the same.
- g. When specific prices of inventory, property, plant, and equipment have increased at a faster rate than the general price level, what will be the relation between M and S?

- h. Respond to part g, assuming that specific prices have increased at a slower rate than the general price level.
- i. Respond to part g, assuming that specific prices have increased at the same rate as the general price level.
- j. If sales and cost incurrences occur evenly over the year and the constant dollar date is year-end dollars, what should be the relation between L and R?
- l. During inflation, a firm with a relatively large net debt-equity ratio will find this item to be a positive amount.

EXHIBIT 10INCOME STATEMENT RELATIONS
(Problem 22)

	Acquisition Cost/ Nominal Dollars (1)	Acquisition Cost/ Constant Dollars (2)	Current Cost/ Nominal Dollars (3)	Current Cost/ Nominal Dollars (4)
Sales	A	E	J	P
Expenses	<u>B</u>	<u>F</u>	<u>K</u>	<u>Q</u>
Operating Income	C	G	L	R
Realized Holding Gains and Losses	—	—	M	S
Unrealized Holding Gains and Losses	—	—	N	T
Purchasing-Power Gain or Loss	=	H	=	<u>U</u>
Net Income	<u>D</u>	<u>I</u>	<u>O</u>	<u>V</u>