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# Inflation accounting methods and their effectiveness

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Monterey, California. Naval Postgraduate School

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INFLATION ACCOUNTING METHODS  
AND THEIR EFFECTIVENESS

by

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Submitted in partial fulfillment  
of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

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June 1992

## ABSTRACT

This thesis provides an overview of inflation accounting methods and their applications as accounting standards. Constant purchasing power accounting and current cost accounting are explained as the major inflation accounting methods. Inflation accounting standards announced in the United States, Britain, and Canada are presented in a comparative manner. Several empirical studies which examined the usefulness of the inflation disclosures required by the U.S. Financial Accounting Standards Board Statement No.33 are reviewed to provide information on the effectiveness of inflation accounting methods. These studies produced mixed results. While some showed enhanced information value in inflation disclosures, others showed none.

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## I. INTRODUCTION

### A. BACKGROUND

The main objective of financial reporting is to provide a fair presentation of a business' operations and current position. Reliability of financial statements is very important, because many decisions by investors, government and management are based on the information provided in these reports. Financial statements report business performance in terms of money as a common measuring unit. The conventional method of financial reporting (i.e, historical cost accounting) is based on the business accounts which record all business transactions at their nominal amount at the unique times of transactions. A basic assumption is that money as a common measuring unit is stable in value and represents a constant amount of goods and services at any point in time.

Inflation has become a major problem in many countries, especially after the 1970s. During inflation, the purchasing power of money declines as the prices of goods and services increase. A constant amount of money can buy lower and lower amounts of goods and services through time. This situation decreases the reliability of money as a measuring unit. Financial statements based on money amounts with different purchasing power fail to measure business performance correctly. In market economies, prices of goods and services

may change in different directions and at different rates over time. Inflation represents the upward movement of the average of all these specific price changes. Changes in the prices of specific goods and services used by a business also decrease the reliability of financial statements, since the book values of these items do not reflect the current costs incurred by the business.

Inflation accounting attempts to develop accounting methods which can neutralize the distortional effects of inflation or, in more general terms, the distortional effects of changing prices. In the accounting literature, two main inflation accounting methods have been developed: constant purchasing power accounting and current cost accounting. These two methods will be explained in the second chapter. On the application side, the U.S. Financial Accounting Standards Board Statement No.33 was the first inflation accounting standard and required the disclosure of inflation information by using both inflation accounting methods. This statement initiated a great deal of discussion and provided invaluable data for researchers to evaluate the inflation accounting methods.

This thesis examines the evolution of the inflation accounting methods and their applications. Also, some key issues of inflation accounting are explored, and results of several empirical studies on the usefulness of inflation accounting methods are presented to provide a comprehensive

approach to inflation accounting. Only such a comprehensive approach would help to improve the reliability of financial statements and lead to more efficient decisions both by investors and business management.

## **B. RESEARCH QUESTION**

The ultimate issue for this research is whether the disclosure of inflation information improves the usefulness of the financial statements for the users. Subsidiary questions underlying this issue include these:

1. What is the nature of inflation? How does it affect the measurement of business performance?
2. What methods are developed to account for inflation?
3. What are the advantages and disadvantages of these methods?
4. What accounting standards have called for the disclosure of inflation information? In what manner have these standards employed inflation accounting methods?
5. What evidence is there regarding the usefulness of the disclosure of inflation information in financial statements?

## **C. RESEARCH METHODOLOGY**

This study is based on a review of the recent accounting literature on inflation accounting and the FASB regulations. Empirical studies which were conducted after the release of FASB Statement No.33 are reviewed, since they are based on the real world data provided by the disclosures required by this statement. The study presents a comparative analysis of different approaches to inflation accounting.

#### D. ORGANIZATION OF THE STUDY

The thesis consists of six chapters. After the introduction, the second chapter explains the nature of inflation and its effects on the measurement of business performance. The deficiencies of historical cost accounting during inflationary periods are presented to highlight the motivation behind inflation accounting. In the third chapter, two main methods of inflation accounting are presented along with their advantages and disadvantages with respect to each other and to the historical cost accounting model. The fourth chapter includes a comparative review of the inflation accounting standards issued in the United States, Britain, and Canada. In the fifth chapter, several empirical studies which evaluate the usefulness of inflation disclosures provided in compliance with the FASB Statement No.33 are presented. The last chapter includes some conclusions about inflation accounting, based on the review of accounting literature and empirical studies.

## II. NATURE OF INFLATION

### A. DEFINITION AND MEASUREMENT

Inflation is usually defined as a decline in the general purchasing power of money due to an increase in the general level of prices [Ref.1]. In essence, a certain amount of money can purchase lower amounts of goods and services over time during inflation. Deflation, which is the opposite of inflation, can be defined as an increase in the general purchasing power of money due to a decrease in the general price level. In fact, prices of goods and services in an economy may change in different directions and at different rates through time, and the general price level represents the average of all these specific price changes.

Inflation is easier to define than to measure [Ref.2]. One commonly used measure of the U.S. price level is the Consumer Price Index (CPI). In preparing the index, a bundle of goods and services in a certain weighted combination is determined; the total price of the bundle is calculated every month and an annual average is also determined. Then, these totals are expressed as percentages of a predetermined year's total, namely the base year. Although the logic seems straightforward, some very important assumptions affect the accuracy of the measurement. First, not all goods and services in the economy are included, and relative weights assigned to

the items included are arbitrary. Second, goods and services which are available in a year may not be available in other years, and consumption patterns reflected by the relative weights of items in the bundle may change over time. Finally, quality improvements may cause price increases that are not part of the inflation.

Another common measure of price level is the Gross National Product (GNP) price deflator. The preparation methodology is the same as with the Consumer Price Index, but the bundle includes all final goods and services produced in the economy in a certain year. For example, items like airplanes, industrial machines, computers, and office space are also included.

From a statistical perspective, GNP deflator is preferred since it covers a broader base. Economists, however, prefer CPI on the grounds that purchasing power should be limited to items which are used by an average consumer. Economists tend to perceive the general price level as the cost of living of an average consumer. Ideally, an individual cost of living index would be superior to both indexing methods, if it were practicable [Ref.3]. Price levels determined by price indices are averages of all specific price changes, which are not necessarily at the same rate or even in the same direction. They don't explain whether and how much a specific person or entity is better off or worse off during inflation. But they

do provide a reasonably reliable measure of overall price changes [Ref.2].

## **B. CAUSES OF INFLATION**

Economic theory tells us that inflation is caused by too much money chasing too few goods. This statement implies that either a substantial increase in the amount of money or a substantial decrease in the amount of goods available in the economy results in inflation. These two factors are named demand stimulus and supply shocks, respectively. On the demand side, expansionary monetary policies of governments to reduce unemployment seem to play the greatest part. On the supply side, food and energy shortages and inadequate increases in productivity are stated as important factors.

Although high inflation periods were experienced by many countries in the past, inflation in the 1970s had the remarkable feature of spreading simultaneously across the world. Prices of internationally traded goods rose by 24% in 1973 and by 39% in 1974. Domestic inflation rates in the industrial countries rose from an average of 4.5% in 1967 - 72 to 7.5% in 1973 and to 12.6% in 1974. In the following years, high inflation rates became a common feature of developing countries [Ref.4]. Inflation rates for different groupings of countries are illustrated in Table 1.

**TABLE 1. INFLATION RATES IN INDUSTRIAL AND DEVELOPING COUNTRIES**

| GROUP                                  | 1967-72 | 1973 | 1974 | 1975 | 1976 | 1977 |
|--|---------|------|------|------|------|------|
| Industrial Countries                   | 4.5     | 7.5  | 12.6 | 10.7 | 7.7  | 7.8  |
| Oil-exporting Countries                | 8.0     | 11.3 | 17.0 | 19.7 | 16.2 | 15.0 |
| Non-oil-exporting Developing Countries | 10.1    | 22.1 | 33.0 | 32.3 | 32.3 | 31.5 |
| Africa                                 | 4.8     | 9.3  | 18.6 | 16.4 | 18.8 | 25.0 |
| Asia                                   | 5.4     | 14.9 | 27.8 | 11.5 | 1.5  | 8.8  |
| Latin America                          | 15.9    | 30.8 | 40.9 | 54.6 | 62.7 | 51.6 |
| Middle East                            | 4.3     | 12.7 | 21.8 | 20.3 | 17.4 | 24.2 |

The 1970s was a decade of inflation in the United States. The average inflation rate for the decade was double the long-run historical average. Alan S. Blinder states four major reasons for the 1970s' inflation: rising food prices, rising energy prices, the end of the Nixon wage-price control programs,<sup>1</sup> and rising mortgage interest rates<sup>2</sup> [Ref.5]. In 1980, it reached the highest level since 1947, at 13.5%.

---

<sup>1</sup>President Nixon announced a three-month freeze of wages and prices on 15 August 1971. Evolving through several phases, it ended at the end of April 1974.

<sup>2</sup>Actually, high mortgage interest rates are an effect of inflation. However, when mortgage payments are included in the price index with a relatively higher weight, increases in mortgage interest rates dramatically affect annual inflation rates.



Inflation levels in the United States between 1950 and 1990 are presented in the Figure 1.



Figure 1: The U.S. Inflation Levels, Historical Consumer Price Index for All Urban Customers.

### C. EFFECTS OF INFLATION ON A BUSINESS

Inflation implies that money, as a fundamental measuring unit, fluctuates in value through time and that comparisons of financial data over time may be misleading. In the accounting world, all transactions, liabilities, and assets of a business are recorded at their nominal value at the time of transactions. Obviously, two basic functions of accounts are to keep

track of transactions and to determine performance through time. If money amounts recorded at different times do not reflect the same purchasing power, real performance may not be determined correctly through conventional accounting.

Two common measures of business performance are income and rate of return on capital. Since depreciation charges for long-lived assets do not reflect the current costs, accounts kept in historical dollars overstate income. If the inflation rate is high enough, even the costs which are incurred in the same year when they are expensed do not reflect the current costs. On the other hand, revenue increases as prices rise. Thus, an overstated income results. In addition to the overstatement of income, understated book values of assets compound the effect upon the rate of return on capital.

In parallel to the overstatement of income, the effective tax rate also increases. Since income tax is determined as a percentage, it goes up with reported income. However, real income may not have increased at all. As a result, the effective tax rate, tax as a percentage of real income, becomes larger.

Another issue is the maintenance of business capital represented by stockholders' equity. Basically, income is divided among tax, dividends and retained earnings. As illustrated above, the effective tax rate increases under inflation and takes a greater portion of income. On the other hand, stockholders expect to receive enough dividends to make

up for inflation. However, if sufficient earnings to maintain the physical capital are not retained, dividend policies based on overstated income figures may erode the capital base [Ref.7]. Physical capital represents the resources necessary to maintain the existing level of productive capacity.

The effects of inflation on a business enterprise and on its financial statements depend on the change in the general price level and the composition of its assets and liabilities [Ref.8]. Since money loses its purchasing power during inflation, assets which are held as monetary amounts, like cash and accounts receivable, decline in real value. On the other hand, non-monetary assets like plant, equipment, and inventory appreciate in nominal terms. The same effects are valid for monetary and non-monetary liabilities. The distinction between monetary and non-monetary items is stated by FASB Statement No.33 as follows:

A monetary asset is either money or a claim held by an enterprise for the future receipt of money whose amount is either fixed or is determinable without reference to the future price of a specific good or service. A monetary liability is just the converse. It is an obligation to pay an amount of money whose amount is either fixed or is determinable without reference to the future price of a specific good or service. Non-monetary assets and liabilities are defined as any assets or liabilities which is not monetary. [Ref.1]

If a business has more monetary liabilities than monetary assets during inflation, a purchasing power gain results. Thus, a business prefers to have more monetary liabilities than monetary assets, which might not be desirable without inflation.

An important feature of inflation which largely determines its impact is the level of anticipation. If perfectly anticipated, inflation can be reflected in nominal interest rates and capital budgeting decisions to eliminate its anticipated effects. If it comes as a surprise, its impact will be larger. Also, higher inflation rates are likely to be associated with a wider range of variability of actual inflation rates [Ref.9].

Another problem is the uncertainty about future prices during inflation. R. J. Chambers states that specific prices and general price levels reacts upon each other. If the average level of nominal income rises faster than some prices and slower than some other prices, the result is a change in spending patterns and consequently in relative prices. Now, we know that prices have changed, but we cannot know what portion of this change is due to demand and supply conditions and what portion is due to general price level changes [Ref.10].

#### **D. SUMMARY**

The objective of publishing financial statements is to render a fair presentation of a business' activities and current position. Financial statements based on historical costs does not achieve this objective during periods of inflation due to the effects stated above. The basic problem stems from the fact that money is an elastic measuring device; it is not stable as is assumed in historical financial

statements [Ref.11]. Since investment decisions are largely based on financial statements as an indicator of business performance, distortions introduced by inflation may lead to inefficient or wrong decisions both by management and stockholders. Following chapters will explore the methods which are designed to neutralize the distortional effects of inflation so far and their effectiveness in achieving this objective.

### III. METHODS OF INFLATION ACCOUNTING

#### A. INTRODUCTION

Interest in inflation accounting has changed through time in direct relation to the inflation rate [Ref.12], and the debate on the issue has intensified during periods of high inflation. However, low annual inflation rates can also exert significant impact on accounting if compounded over a long period of time [Ref.12]. Moreover, effects of inflation on business performance lingers long after inflation subsides [Ref.13]. This situation extends the need for inflation accounting over periods longer than the duration of high inflation. Although there is no agreement among accounting professionals upon a single accounting method to neutralize the effects of inflation, inflation accounting has developed along two main streams of thought; constant purchasing power accounting and current cost accounting.

In the constant purchasing power accounting method, historical cost financial statements are restated to reflect the changes in the general purchasing power of money by using publicly provided general price indices. On the other hand, the current cost accounting method replaces historical costs with current costs and departs from the conventional income determination technique of historical cost accounting. Current cost accounting is really an alternative to historical cost

accounting, whereas constant purchasing power accounting is an adjustment to historical cost for the decline in the general purchasing power of the money. Constant purchasing power accounting focuses on general price level changes, but current cost accounting deals with the changes in the prices of specific assets. General price level is the average of the prices of all goods and services in an economy, and specific price changes in opposite directions may balance out to zero. In such a case, the constant purchasing power accounting method does not require any adjustment to historical cost financial statements. However, current cost accounting does require the consideration of each specific price change separately in the preparation of current cost financial statements.

## **B. CONSTANT PURCHASING POWER ACCOUNTING**

### **1. Definition**

Historical cost statements are based on accounts measured in dollars which have different levels of purchasing power. Constant purchasing power accounting converts these into money amounts with the same purchasing power. Purchasing power of money is determined at a certain point in time through the use of price indices. The overall objective of the method is to determine the real changes in the well-being of the business and to exclude all effects resulting from the fluctuations in the value of money which do not represent real changes in financial position of a business [Ref.2].

## 2. Methodology

### a. Use of Price-Level Index Numbers:

To adjust the historical cost statement balances, index numbers for all relevant periods should be obtained. All index numbers must be based on the same year. Price indices published at different times may use different base years. Index numbers are published for each month-end and an average for the year is also included. Different account balances may require the use of different index numbers. For example, some transactions occur evenly throughout the year, such as sales and wages, and the balances that include these transactions are assumed to reflect the average index number for that year. Assume that sales for 1990 will be restated in 1990 year-end dollars. The restated amount is calculated as follows:

$$\text{Restated sales} = (\text{1990's sales}) * \frac{(\text{1990 year-end index})}{(\text{1990 average index})}$$

Some transactions, however, reflect the price levels at the unique times of transactions, such as money borrowed or equipment purchased. If equipment is purchased on 30 May 1990, the original cost of the equipment is restated in 1990 year-end dollars as follows:

$$\text{Restated Cost} = (\text{Original Cost}) * \frac{(\text{1990 year-end index})}{(\text{1990 May's index})}$$

With this introduction, a more detailed explanation of the constant purchasing power method can be presented. Adjusted amounts for a specific date can be found



that date's index number in the numerator in the above equations and this number is the same for every item. In the following discussion, only the index number which is the denominator in these equations is specified because that number may be different for different items.

*b. Adjustment of Income and Retained Earnings Statements: [Ref.14]*

(1). Sales and Expenses Other Than Cost of Goods Sold and Depreciation. These balances can be assumed to be taking place evenly throughout the year and they are restated by using the average index number for the year.

(2). Cost of Goods Sold. For this account, the adjustment method depends upon the beginning and ending inventory levels and the inventory pricing method used.

In last-in, first-out inventory pricing, if the beginning and ending inventory levels are the same or the ending inventory level is higher, the balance is adjusted by using the average index number for the year. If the ending inventory is lower, the difference is adjusted by using the index number at the beginning of the year, since the difference comes from the beginning inventory. The remainder is adjusted by use of the average index for the year.

In first-in, first-out inventory pricing, the portion of the balance which is equal to the beginning inventory level is adjusted by using the index number at beginning of the year. The rest of the balance is adjusted by using the average index for the year. However, if the amount

of goods sold is less than the beginning inventory level, this means that all of the cost of goods sold comes from the beginning inventory and the total balance should be adjusted by using the index number at the beginning of the year.

If the average cost inventory pricing method is used, the total balance can be adjusted by using the average index number for the year.

(3). Depreciation. Historical cost of a depreciable asset is restated from the date of purchase and then an adjusted depreciation charge is determined by applying the rate required by the depreciation schedule to the restated cost.

(4). Dividends. They are adjusted by using the index number at the time of payment to the stockholders.

(5). Gain or Loss on Monetary Items. A business incurs a purchasing power loss if it holds a monetary asset during inflationary periods. However, monetary liabilities give rise to a gain. The net monetary position determines the magnitude of the gain or loss. The difference between the nominal net monetary position and the adjusted net monetary position at the year-end is disclosed as the gain or loss on monetary items. Assume that the following information about a business is available for the current year and a purchasing power gain or loss on monetary items will be determined. Net monetary position (monetary assets minus monetary liabilities) at the beginning of the year is \$1000. Accounts receivable

increased by \$3000 during the current year. Expenses also increased by \$3000 and \$500 worth of merchandise has been purchased on credit at the year-end. The beginning, average and ending index numbers for the year are 100, 150 and 200, respectively. There has been no other change in monetary items. Purchasing power gain or loss calculations are shown in Table 2.

**TABLE 2. PURCHASING POWER GAIN OR LOSS CALCULATIONS**

| MONETARY ITEMS                             | NOMINAL AMOUNT | INDEX RATIO | ADJUSTED AMOUNT |
|--|----------------|-------------|-----------------|
| Net Monetary Position At Beginning of Year | \$1000         | 200/100     | \$2000          |
| Account Receivables                        | \$3000         | 200/150     | \$4000          |
| Expenses                                   | (\$3000)       | 200/150     | (\$4000)        |
| Purchase of Merchandise                    | (\$500)        | 200/200     | (\$500)         |
| Net Monetary Assets At Year-end            | \$500          |             | \$1500          |

$$\begin{aligned} \text{Purchasing Power Loss} &= \text{Adjusted Amount} - \text{Nominal Amount} \\ &= \$1500 - \$500 = \$1000 \end{aligned}$$

*c. Adjustment of The Balance Sheet: [Ref. 14]*

(1). Monetary Assets and Liabilities. These amounts are not adjusted.

(2). Inventories. The inventory pricing method affects the calculations. The adjustments for three inventory pricing methods are explained below.

In the last-in, first-out method, if the ending inventory level is lower than or equal to the beginning inventory, total inventory balance is adjusted by using the

index number at the beginning of the year. If the ending inventory level is higher than the beginning inventory level, the increase should be adjusted by using the average index number for the year, since this amount is assumed to be purchased at the average price level of the year. The remainder is adjusted by using the index number at the beginning of the year.

In the first-in, first-out method, if the cost of goods sold is higher than or equal to the beginning inventory level, the total inventory balance is adjusted by using the average index number for the year. If the cost of goods sold is lower than the beginning inventory level, the amount which is equal to the difference between cost of goods sold and the beginning inventory should be adjusted by using the index number at the beginning of the year, since this portion comes from the beginning inventory. The rest of the inventory balance is adjusted by using the average index number for the year, since it is purchased throughout the year.

If the average cost inventory pricing method is used, the total amount of cost of goods sold can be restated by using average index number for the year.

(3). Plant and Equipment. Historical costs of plant and equipment are adjusted by using the index number at the date of purchase. Adjusted amounts of accumulated depreciation are derived from these adjusted costs.

(4). Capital Stock. The adjustment is made by using the index number at the date when stocks were issued.

(5). Retained Earnings. The adjusted amount of the change in retained earnings for the year is obtained by subtracting the adjusted dividends from net profit in the adjusted income statement. The beginning balance is adjusted by use of the index number at the beginning of the year.

By using this methodology, historical cost financial statement balances can be restated in terms of any desired date's purchasing power. If financial statements are restated in terms of year-end purchasing power every year, restatement of these adjusted statements with respect to a new point in time will be one step easier, since all adjusted balances reflect the same purchasing power. Preparation of comparative financial statements will also be easier.

### **3. Advantages of Constant Purchasing Power Accounting:**

First of all, constant purchasing power accounting is the most readily available method for coping with the effects of inflation on accounting practices. Price indices are prepared and published every month and computations are fairly simple. Also, the Consumer Price Index is an objective basis, since it is prepared by an unbiased government agency. Moreover, it is argued that adjustment based on the Consumer Price Index makes the most sense for the stockholders, who are also consumers. Stockholders can more easily relate these adjusted figures to their personal expectations and needs

[Ref.11]. As a result, they can make more informed decisions by understanding the real return on their investments.

Another important use of financial data is trend analysis which requires the comparison of performance through successive years. Such an analysis has more meaning if the compared amounts not reflect the same purchasing power. Constant purchasing power accounting facilitates trend analysis by restating all balances in terms of money units which have the same purchasing power.

#### **4. Disadvantages of Constant Purchasing Power Accounting:**

Disadvantages of this method originate from the use of general price indices. The central argument is that not everyone is affected by inflation in the same manner, and general price indices, which are averages, may not apply to any individual in reality. From this perspective, two conclusions are drawn. First, these adjustments do not yield relevant data for some businesses, such as steel and oil companies which mainly own long-lived assets. Secondly, the cost of assets restated in current purchasing power reflects neither what it would cost to buy the asset today nor what it could be sold for. Thus, interpretation of these adjusted figures in the real world is very difficult [Ref.11].

## C. CURRENT COST ACCOUNTING

### 1. Definition

As previously mentioned, chapter, current cost accounting constitutes a departure from historical cost, whereas constant purchasing power accounting merely restates the historical balances in terms of current purchasing power of money. Current cost financial statements replace the historical costs with current costs. These current costs are determined by using various valuation methods, and changes in the prices of all specific assets are accounted for separately.

"Proponents of current cost accounting argue that the decision usefulness of historical cost data declines, even if there is no general inflation, when prices change in the specific goods and services purchased by a company" [Ref.15]. They advocate the use of current costs for all assets and expenses instead of historical costs. However, determination of some current costs cannot be done accurately due to technological changes and incomplete markets for certain assets. Moreover, it is impossible for a single and neutral agency, such as government, to provide current prices of numerous different items in an economy. Thus, the objectivity of current cost accounting is considerably lower than that of constant purchasing power adjustments, which are based on general price indices published by the government.

As an integral feature of all market economies, prices of specific goods and services fluctuate due to changes in demand and supply as well as due to technological innovations [Ref.16]. These conditions affect investor's judgement about the present worth of a business and its viability through time. Current cost proponents feel that the real problem is not the decline of the purchasing power of money, but the deficiencies in the historical cost model.

An understanding of current cost accounting requires the exploration of various valuation methods which are employed to determine current costs. Once the current costs are obtained, financial statements can be produced by replacing historical costs with these values. Financial statement format stays the same.

## **2. Valuation Methods To Determine the Current Values:**

In this section, four major valuation methods which provide a measure of current values will be discussed. These methods are replacement cost, exit value, present value and value to the owner. In general, all methods utilize market prices, if available, to determine current values.

### ***a. Replacement Cost***

As the name implies, replacement cost is based on the current buying prices of the assets of a business which were acquired in the past. It is the basis for current cost accounting. In 1976, the Securities and Exchange Commission of



the United States issued ASR 190, which required large corporations to disclose supplemental replacement cost data in their financial statements for cost of goods sold, inventories, depreciation and productive capacity. In this statement, replacement cost is defined as "how much it would cost to replace existing productive facilities and inventories in the manner in which they would actually be replaced" [Ref.17]. In this definition, replacement costs may be overstated since companies generally replace their productive facilities with more expensive and technologically superior ones, so as to reduce labor and other operating costs. However, a replacement cost within the above definition ignores this important dimension of the replacement.

Laurence A. Friedman proposes another definition to eliminate this deficiency. He defines replacement cost as the current cost to acquire the productive capacity which would provide the current level of economic services [Ref.17]. Here, the basis for replacement cost is not the existing facilities, but the level of economic services provided by them.

*b. Exit Value<sup>3</sup>*

Exit value is the money amount that could be received by selling an asset in the current market. To determine such a value objectively, a complete market for the

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<sup>3</sup> Another common term for this valuation method is net realizable value which equals the selling price less selling costs.

asset should exist, as is required for replacement cost. In reality, complete markets which can provide both selling and buying prices for assets may not exist, especially in case of assets which have very specific uses. Moreover, many assets are held to be used in operations rather than to be resold. As a result, valuation has to be based on hypothetical transactions and subjectivity may inevitably be injected.

*c. Present Value (Discounted Cash Flows)*

In this method, the current value of an asset is calculated by discounting the future net cash receipts expected from its use. For this calculation, two essential pieces of information are needed; the amounts of expected future receipts and the appropriate discount rate. Obviously, these data cannot be determined accurately and require assumptions about the future. In practice, present value calculations are regarded as too subjective by accountants to provide a reliable basis for the valuation of non-monetary assets for external reporting purposes [Ref.17].

Geoffrey Whittington refers to the three preceding valuation methods as "pure valuation basis" and he states that "each method is of potential relevance in particular circumstances, and in some cases a comparison might be desirable among the values derived from alternative valuation basis" [Ref.3]. George Staubus tried to identify the appropriate valuation for particular assets in particular situations. He suggests that net realizable value is

appropriate for inventory valuation since inventory is held for resale. For the valuation of assets which are held for use in operations, he suggests the use of replacement cost [Ref.17].

None of these valuation methods is regarded as a complete solution to the valuation problem by itself. As a result, another method which utilizes all three "pure" valuation methods has evolved in British inflation accounting literature under the name of "value to the owner". It has become part of accounting practice and received considerable attention, especially in Great Britain [Ref.3].

#### *d. Value To the Owner*

Value to the owner is the minimum loss which a business would incur if it were deprived of an asset [Ref.3]. The first step in the application of this method is to determine three possible current values by using the preceding three pure valuation bases. In the next step, these values are compared to determine the minimum loss by assuming that the business is deprived of an asset and, normally, that it is trying to maximize its profits. Solomons first stated the "value to the owner" rules in the familiar inequality form which later became popular [Ref.3]. These rules determine the appropriate current value for all possible combinations of replacement cost (RC), net realizable value (NRV), and present value (PV) under the assumptions of deprival and profit maximization. Table.3 illustrates these rules.

**TABLE.3 VALUE TO THE OWNER RULES**

| CASE NUMBER | INTERRELATIONSHIP | VALUE TO THE OWNER |
|-------------|-------------------|--------------------|
| 1           | $PV > RC > NRV$   | RC                 |
| 2           | $PV > NRV > RC$   | RC                 |
| 3           | $RC > PV > NRV$   | PV                 |
| 4           | $NRV > PV > RC$   | RC                 |
| 5           | $NRV > RC > PV$   | RC                 |
| 6           | $RC > NRV > PV$   | NRV                |

In cases 1 and 2, the business prefers to replace the lost asset since its present value is greater than replacement cost. Thus, replacement cost is the current value of the asset since it represents the minimum loss to be incurred by the business in case of deprival. In case 3, because the replacement cost is greater than the present value, the rational choice is not to replace the lost asset. If the asset is not replaced, the loss will be equal to the present value. Cases 4 and 5 represent a situation where an asset can be sold at an amount higher than what it would cost to buy it. Thus, replacement is the appropriate choice and the cost of replacement equals the current value. In the last case, the lost asset should not be replaced, since its present value is less than replacement cost and the asset could be sold at an amount higher than its present value if it were not lost. As a result, net realizable value equals the current value which represents the minimum loss to be incurred by the business.

Reliance on present values, which are perceived as too subjective by accountants for external reporting purposes, constitutes the main weakness of the value to the owner method. R. J. Chambers states that "present values cannot be compared to net realizable values and current costs since they are not in the same domain" [Ref.18]. Present values are expectations whereas the others are facts, that is, accessible amounts of money at a certain date. Another problem is the extra effort required for calculations separately for each valuation basis. However, the value to the owner method avoids abnormal valuations that may result from using a single valuation method.

### **3. Holding Gains and Losses**

Current cost proponents believe that gains and losses which result from possessing assets during a period of changing prices should not be included in the income from operations. They suggest that these gains and losses should be disclosed separately in current cost financial statements [Ref.19].

An illustration may be useful to further the understanding of holding gains and losses. Assume that original cost of an asset is \$100 and its current cost at the financial statement date is \$110. If the asset is sold for \$120, current cost income will be \$10. However, historical cost income would be \$20. The \$10 difference between the incomes results from holding the asset while prices change and

it should be disclosed separately if income is determined on a current cost basis.

In fact, there is no agreement in the literature on whether or not to recognize holding gain as part of income. There are two lines of thought on this issue. According to the financial capital maintenance concept (a proprietary view of the business), which is advocated by proponents of constant purchasing power accounting, the real value of the business capital should be maintained before any income is recognized. After the decline in the general purchasing power of the business capital is compensated for, the remainder of the historical cost income can be recognized as real income. Since any remaining holding gains or losses do not necessarily result from the changes in the general purchasing power of the monetary unit, they should be included in business income. On the other hand, the physical capital (or productive capacity) maintenance concept, which is favored by current cost proponents, suggests that the major concern should be the maintenance of the business' ability to provide the same level of economic goods and services in the future before recognizing any income. It is assumed that this would not happen if the business does not accumulate enough resources to replace its productive capacity. As a result, holding gains should be a direct adjustment to stockholder's equity.

#### 4. Advantages And Disadvantages of Current Cost Accounting

Advantages and disadvantages associated with various current valuation methods have been stated along with the discussion of these methods. Subjectivity involved can be stated as the common weakness of all current valuation bases. Subjectivity arises from the fact that not all assets owned by a business have complete markets to indicate selling and buying prices.

Another main objection is that current cost accounting fails to capture the effect of general price level increases while dealing with specific price changes. R. J. Chambers states that " there is a rate of inflation which affects every holder of money or things worth money" [Ref.10]. He suggests purchasing power gains or losses be incorporated in the current cost accounting method. A. Friedman also concurs with Sterling's and others' suggestion that general purchasing power adjustments should be added to any current valuation method [Ref.18].

Lastly, determination of current costs requires the preparation of specific price indices for numerous assets owned by a business, and this may prove to be unmanageable in practice. Costs incurred for the implementation of such a system may never be justified by the benefits received from the information provided. This is a general observation at this point, and this issue will be addressed in more depth in the following chapters.

#### D. SUMMARY

In this chapter, constant purchasing power accounting and current cost accounting are presented as methods employed to report the effects of inflation on financial reporting. In the literature, other methods are proposed which can be regarded as variations of these two basic methods. Deficiencies of historical cost accounting are well recognized, especially during inflationary periods, and many accountants argue that the historical cost method should be replaced with a more competent accounting method which can deal with the effects of changing prices. However, some others argue that the historical cost method is based on arms-length transactions and this objectivity should not be sacrificed by using subjective methods. As a position of compromise, these methods are used to provide supplementary information within historical cost financial statements. In reality, financial statements cannot be perfectly objective, since they are prepared by the firm whose financial position is being reported. Moreover, some unavoidable uncertainties and estimates are part of all financial statements, and inflation adds to these uncertainties. The rational objective should be to reduce this uncertainty to a level which is reasonable. With this point in mind, inflation accounting methods can be utilized to increase the quality of financial data.

In the next chapter, some inflation accounting methods which have been put into practice by standard setting bodies



in different countries will be presented. The United States Financial Accounting Standards Board Statement No.33, which is the most important step in United States inflation accounting practice, will be the focus of the discussion.

## IV. INFLATION ACCOUNTING IN PRACTICE

### A. INTRODUCTION

Effects of general and specific price changes on financial reporting have been known in the accounting world for a long time. In 1922, Professor William Paton stated that "the value of the dollar - its general purchasing power - is subject to serious change over a period of years... Accountants... deal with an unstable, variable unit; and comparison of unadjusted accounting statements prepared at intervals are accordingly always more or less unsatisfactory and are often misleading" [Ref.8]. Despite its early recognition, no official standard-making body had required a disclosure of the effects of price changes until the United States Financial Accounting Standards Board (FASB) published Statement No.33 in September 1979. A British standard was announced in 1980. Two years later, Canada published a standard which only recommended certain disclosures. These three standards will be introduced in the following sections and the differences in their requirements and approaches will be highlighted.

## B. FASB STATEMENT NO.33

### 1. Origins

The Accounting Research Bulletins published in 1947, 1948 and 1953 by the Committee on Accounting Procedure first officially indicated the need for some form of recognition of the effects of price level changes in financial statements. These bulletins dealt with possible changes in acceptable depreciation methods to cover changes in replacement costs.

In 1963, the American Institute of Certified Public Accountants issued Accounting Research Study (ARS) No.6, "Reporting the Financial Effects of Price-Level Changes", which was primarily designed to stimulate the discussion on the topic. ARS No.6 achieved its objective by initiating the Accounting Principles Board (APB), the successor of the Committee on Accounting Procedure, to issue APB Statement No.3 in 1969. The disclosure of general price-level information announced with this statement was voluntary and it found little or no application.

The FASB, which replaced the Accounting Principles Board, issued an Exposure Draft, entitled "Financial Reporting in Units of General Purchasing Power", in 1974. This draft was issued in conjunction with a field test of 100 companies, to gather feedback on the reception to and applicability of general price-level financial statements. This Exposure Draft was the same as APB Statement No.3, from a procedural point of view, and the Board pointed out the usefulness of APB

Statement No.3 in the preparation of the recommended financial statements. Due to the overwhelming negative comments and desire for further analysis of field test results, the FASB was never able to convert this draft to a mandatory standard.

Meanwhile, inflation continued to rise and reached 11% during 1974. Complaints about the deficiencies of historical cost statements were also increasing. The Securities and Exchange Commission, frustrated with slow and hesitant actions of the FASB, established its own requirement by issuing Accounting Series Release (ASR) 190. This statement required certain publicly held corporations to disclose replacement cost information in their yearly reports to the Commission.

In December 1978, the FASB issued another exposure draft entitled "Financial Reporting and Changing Prices", which proposed the disclosure of both general price-level and current cost information. In May 1979, the Board finally recognized the problems in its approach and it sponsored a "Conference on Financial reporting and Changing Prices" in New York City on May 31, 1979. This conference allowed a thorough discussion of the issues and prepared a favorable atmosphere for FASB to introduce its requirements for the disclosure of inflation information in financial statements.

In September 1979, Statement No.33, entitled "Financial Reporting and Changing Prices", was issued. As will be explained later in this chapter, this statement required

certain publicly held companies to disclose both constant purchasing power and current cost information in their financial statements. The FASB also declared that disclosure requirements were experimental and the statement would be reviewed comprehensively after no more than five years. [Ref.20]

## 2. Objectives of Statement No.33

The third paragraph of Statement No.33 states that "the users of financial reports need to understand the effects of changing prices on a business to help their decisions" [Ref.1]. The ways in which this statement may help the users of financial reports are explained as follows:

a. Assessment of future cash flows. Present financial statements include measurements of expenses and assets at historical prices. When prices are changing, measurements that reflect current prices are likely to provide useful information for the assessment of future cash flows.

b. Assessment of enterprise performance. The worth of an enterprise can be increased as a result of prudent timing of asset purchases when prices are changing. That increase is one aspect of performance even though it may be distinguished from operating performance. Measurements that reflect current prices can provide a basis for assessing the extent to which past decisions on the acquisition of assets have created opportunities for earning future cash flows.

c. Assessment of the erosion of operating capability. An enterprise typically must hold minimum quantities of inventory, property, plant, and equipment and other assets to maintain its ability to provide goods and services. When the prices of those assets are increasing, larger amounts of money investment are needed to maintain the previous levels of output. Information on the current prices of resources that are used to generate revenues can help users to assess the extent to which and the manner in which operating capability has been maintained.

d. Assessment of the erosion of general purchasing power. When general price levels are increasing, larger amounts of money are required to maintain a fixed amount of purchasing power. Investors typically are concerned with assessing whether an enterprise has maintained the purchasing power of its capital. Financial information that reflects changes in general purchasing power can help with that assessment. [Ref.1]

Three reasons are stated as to why the effects of changing prices should be measured and disclosed in financial statements:

- a. The effects depend on the transactions and circumstances of an enterprise and users do not have detailed information about those factors;
- b. Effective financial decisions can take place only in an environment in which there is an understanding by the general public of the problem caused by changing prices; that understanding is unlikely to develop until business performance is discussed in terms of measures that allow for the impact of changing prices;
- c. Statements by business managers about the problems caused by changing prices will not have credibility until specific quantitative information is published about those problems. [Ref.1]

The need for experimentation in this area is pointed out in paragraph 13 and it is further stated that "preparers and users of financial reports have not yet reached a consensus on general practical usefulness of constant dollar information and current cost information". [Ref.1] This statement's requirements are perceived as an opportunity for systematic applications that can accumulate experience and real-world data for further study of the problem.

### **3. Required Disclosures**

Public enterprises which own inventories and property, plant, and equipment more than \$125 million or total

assets more than \$1 billion were required to present certain financial data based on both constant purchasing power (referred to as constant dollar in the statement) and current cost accounting methods. Statement No.33 states that recoverable amounts should be used instead of constant dollar and current cost amounts if they are materially or permanently lower. "Recoverable amount" is defined as "the current worth of the net amount of cash expected to be recoverable from the use or sale of an asset". If an asset is held for sale, recoverable amount equals net realizable value. If it is held to be used in operations, then recoverable amount equals the present value of the future cash flows expected from the use of the asset.

*a. Constant Dollar Information*

The minimum requirement included the restatement of inventory, property, plant, and equipment, cost of goods sold, and depreciation, depletion, and amortization expense by using the average CPI number for the current year. Business income should be recomputed and disclosed based on these restated amounts. Also, the purchasing power gain or loss on net monetary items must be calculated "by restating in constant dollars the opening and closing balances of, and transactions in, monetary assets and liabilities". However, if a business prefers to prepare comprehensive constant dollar statements, year-end index number can also be used. [Ref.1]

### *b. Current Cost Information*

The current costs of inventory, property, plant, and equipment, cost of goods sold, and depreciation and amortization expenses had to be measured and disclosed along with the current cost income based on these amounts. Externally or internally generated price indices, current invoice prices, vendors' price lists or other quotations or estimates, and standard manufacturing costs that reflect current costs are recommended as the types of information that may be used to determine current costs. Companies were also given the discretion to choose any other type of information which was appropriate to their particular circumstances. In addition to this information, increases or decreases in the current cost amounts of inventory and property, plant, and equipment (holding gains or losses), should be reported both before and after eliminating the effects of inflation.

### *c. Information For The Most Recent Five Years*

The following financial data should be presented in terms of the current year's or CPI's base year's dollars, and relevant index numbers should also be disclosed:

1. Net sales and other operating revenues
2. On a constant dollar basis;
  - a. Income from continuing operations
  - b. Income per common share from continuing operations
  - c. Net assets at fiscal year-end
3. On a current cost basis;
  - a. Income from continuing operations



- b. Income per common share from continuing operations
  - c. Net assets at fiscal year-end
  - d. Holding gains or losses net of inflation
4. Other information
- a. Purchasing power gains or losses on net monetary items
  - b. Cash dividend declared per common share at fiscal year-end. [Ref.1]

#### **4. Aftermath of Statement No.33**

The discussion and research on the effects of changing prices continued while over 1300 companies prepared the required disclosures for six years until 1986. Meanwhile, inflation had decreased considerably and the cost effectiveness of the disclosures came under question. As a response to growing criticism of mandatory disclosures, the FASB eliminated the requirement for the disclosure of constant dollar information in 1984. The Board stated that the use of two competing bases was confusing and current cost disclosures were more useful [Ref.13]. The FASB was trying to satisfy both the proponents and the opponents of inflation disclosures.

Maintaining the current cost disclosure requirements can be attributed to pressure from the SEC, which long advocated some form of accounting for the effects of changing prices [Ref.21]. However, in 1986, the FASB issued an exposure draft which proposed the current cost requirements be voluntary rather than mandatory, and a majority of the respondents preferred voluntary disclosure [Ref.13]. Consequently, Statement No.89, which made the current cost disclosures voluntary, has been the final step of the FASB's

venture to incorporate some form of inflation accounting in financial accounting standards [Ref.27].

Three main weaknesses are associated with the Board's approach and the requirements of the Statement No.33. From the very beginning, the Board was not able to make a choice between constant dollar and current cost methods. As a result, both kinds of information were required to be disclosed. Parallel use of two conceptually different methods was confusing for the users of financial reports. Secondly, disclosures were described as experimental. Although this was a useful tool for political maneuvering, it discouraged the use of both kinds of information, instead of promoting competition between methods as intended by FASB. Financial analysts, as primary users of financial statements, handled the information with caution and suspicion due to the label "experimental". [Ref.21] Lastly, interpretation of current costs varied among companies due to the generous discretion allowed by the statement and this resulted in noncomparable performance measures under current cost method. Inflation disclosures failed to provide a bottom line measure like historical cost net income, since purchasing power or holding gains or losses weren't included in income figures. All these factors fostered a feeling of confusion and distrust among the users of financial reports who were already familiar with historical cost statements. User indifference to the Statement No.33 disclosures was the dominant behavior. In 1982, Arthur

Young & Company conducted a survey among 500 financial analysts to determine the degree to which inflation information was used. One hundred and ninety useful responses were received and only half of them indicated some use of the disclosures. Less than 19 respondents described their use as frequent. However, these results should not be interpreted as a user indifference to inflation information in general, since inflationary distortions on financial reporting are widely recognized. [Ref.21]

Allowing a real- world experiment may be considered the main contribution of the Statement No.33. The invaluable data accumulated during six years of implementation provided a reliable basis for further research in the United States. Some of these studies will be presented in the next chapter.

### **C. INFLATION ACCOUNTING IN BRITAIN [Ref.12]**

In 1980, the British Accounting Standards Committee issued its Statement of Accounting Practice (SSAP) No.16, entitled Current Cost Accounting. With this statement, most listed companies and other large entities were required to present current cost income statements and balance sheets along with historical cost financial statements. Either of the current cost or historical cost statements could be presented as the primary financial statements. No provision was made concerning general price-level adjustments. The main objective of this standard is:

To provide more useful information than that available from historical cost accounts alone for the guidance of the management, shareholders, and others on such matters as;

- (a) the financial viability of the business
- (b) return on investment
- (c) pricing policy, cost control and distribution decisions; and
- (d) gearing (or financing). [Ref.12]

SSAP Statement No.16 requires a two-step procedure to compute operating income on a current cost basis. In the first step, current cost adjustments for the cost of goods sold, depreciation and monetary working capital are deducted from the historical cost income to obtain "current cost operating income". Monetary working capital can be defined the amount of cash, receivables and other similar current assets which are required to carry out daily business operations. In the second step, gearing adjustment is added to "current cost operating income" to determine the "current cost profit attributable to shareholders". "The gearing adjustment is a measure of the benefit (or cost) accruing to the shareholders for having financed part of the operating assets through debt." [Ref.12] Debt represents a fixed money amount and the prices of the assets purchased by using debt may increase or decrease through time. The difference between the current cost of the asset and fixed amount of debt used to purchase the asset constitutes the gearing adjustment. The rationale behind the gearing adjustment is stated in paragraph 16 as follows:

The net operating assets shown in the balance sheet have usually been financed partly by borrowing and the effect of this is reflected by means of a gearing adjustment in arriving at current cost profit attributable to

shareholders. No gearing adjustment arises where a company is wholly financed by shareholders' capital. While repayment rights on borrowing are normally fixed in monetary amount the proportion of net operating assets so financed increases or decreases in value to the business.... [Ref.12]

In the current cost balance sheet required by the British standard, assets are presented "at their value to the business based on current prices". Value to the business is defined as the net current replacement cost, or recoverable amount, if a permanent decrease to below net replacement is recognized.

SSAP No.16 is based on the physical capital maintenance concept and, consistent with this approach, it requires a monetary working-capital adjustment. As stated in paragraph 11, "this adjustment should represent the amount of additional (or) reduced finance needed for monetary working-capital as a result of changes in the input prices of goods and services used and financed by the business". [Ref.12]

The British standard has been criticized in two aspects which eventually prevented it from gaining general acceptance. It didn't require the disclosure of purchasing power gains and losses on holding monetary items, and also it didn't address the measurement unit problem which deals with the erosion in the value of the monetary unit due to inflation. In 1985, the requirements were downgraded to a nonmandatory status. The British Accounting Committee continues research for a more acceptable standard to report the effects of changing prices.

#### D. INFLATION ACCOUNTING IN CANADA [Ref.12]

The Canadian Institute of Chartered Accountants released a standard entitled "Reporting the Effects of Changing Prices" in October 1982. This standard only recommended certain disclosures and compliance was voluntary.

The Canadian standard identified five objectives that could be achieved by recommended disclosures:

1. Maintenance of the operating capability of the enterprise,
2. Maintenance of the operating capability financed by the common shareholders,
3. Evaluating performance,
4. Maintenance of general purchasing power of capital,
5. Assessment of future prospects. [Ref.12]

Consistent with these objectives, disclosure of both general price-level and current cost information was recommended. Inventory, property, plant, and equipment would be reported at their current values and reductions from current value to lower recoverable amounts would also be disclosed. Additionally, a current cost income would be calculated by the use of current costs or lower recoverable amounts of cost of goods sold, depreciation, depletion and amortization expense. Other informative disclosures are stated as follows:

1. Changes in the current cost values of the inventory, plant and equipment during the reporting period, together with information as to any reduction from current costs to lower recoverable amounts.
2. The amount of changes in the current cost amounts of inventory, property, plant and equipment that is attributable to the effects of general inflation.

3. The amount of the gain or loss in general purchasing power that results from holding net monetary items during the reporting period. This amount is to be disclosed separately and not included in computing the income for the period.

4. The financing adjustment based on the current cost adjustments to income for the period. [Ref.12]

This financing adjustment which is the same as "gearing adjustment" in the British standard. However, there is no provision for a working-capital adjustment, and this impedes the measurement of a comprehensive current cost income. Except for the financing adjustment and voluntary compliance, the Canadian standard is quite similar to FASB Statement No.33.

For comparison purposes, the same information from the preceding year's financial reports stated in constant dollars is to be presented with current year's data.

#### **E. SUMMARY**

Inflation accounting standards which were adopted in the United States, Britain and Canada were briefly presented in this chapter. It should be noted that all three countries are highly industrialized and they all have well-organized capital and stock markets. Moreover, inflation rates experienced in these countries have been considerably lower than the inflation rates in other countries with less-developed economies. However, these standards and accompanying research and discussion have addressed the fundamental issues of reporting the effects of changing prices in financial statements.

The United States and the Canadian standards seem to have a more comprehensive approach, since they address both general and specific price changes. The British standard, on the other hand, deals only with specific price changes and ignores the decrease in the general purchasing power of the monetary unit. Such an approach may prove to be quite insufficient during periods of high inflation.

Both FASB No.33 and the Canadian standard have reflected the need for a disclosure of financial data from different years stated in the same purchasing power, to facilitate trend analysis over a period of years. The British announcement disregards such a need. However, SSAP No.16 allows the measurement of a more comprehensive current cost income by requiring a monetary working-capital adjustment. Failure of the British standard to gain general acceptance "has been attributed to its neglect of the measurement unit problem and to its failure to account properly for purchasing power gain on debt in an inflationary period" [Ref.12].

Both before and after inflation information disclosures were required by standard-setting bodies, many studies have been conducted to evaluate the usefulness of inflation disclosures in practice. Of course, the studies which are based on real-world data provided by as a result of announced standards have provided a more valuable evaluation of the disclosures. In the next chapter, some of these studies will



be presented to present a more realistic view of inflation accounting methods.

## V. EMPIRICAL STUDIES ON INFLATION ACCOUNTING

### A. INTRODUCTION

The FASB Concepts Statement No.1, Objectives of Financial Reporting by Business Enterprises, states that "financial reporting should provide information to help investors, creditors, and others assess the amounts, timing, and uncertainty of prospective net cash flows into the enterprise" [Ref.28]. Inflation accounting methods are designed to remedy the deficiencies of conventional financial statements during periods of changing prices. The contribution of these methods to the purpose of financial reporting should be verified through empirical studies if inflation accounting methods are to be accepted as accounting principles.

Although persuasive arguments are made for the relevance of inflation data on theoretical grounds, surveys of managers, auditors, and professional analysts show that inflation disclosures required by FASB Statement No.33 did not find much use in practice [Ref.22]. Such a result casts doubt on the usefulness of the inflation data and also constitutes a major obstacle for empirical research. How can the contributions of the inflation disclosures be observed in the real world if they are hardly ever used? Even if they are used, it is practically impossible to distinguish the contribution of inflation information from that of historical cost data, since

they become available to the user at the same time. These factors, combined with all the others which affect individual economic decisions, prevent the researchers from designing perfectly reliable research methodologies and from providing conclusive results.

In the following sections, some of the studies which examined the usefulness of Statement No.33 in practice are summarized. These studies can be classified into three general types. The first and largest group of studies tried to find relationships between inflation information and stock prices. The studies which examined the changes in the relative profitability of different industries and companies under alternative accounting methods, such as constant purchasing power and current cost, can be considered the second type. The third category includes the studies which attempted a cost-benefit analysis from an economic efficiency perspective.

## **B. INFLATION DISCLOSURES AND STOCK PRICES**

Most researchers tried to determine a relationship between inflation-adjusted accounting data provided by the Statement No.33 disclosures and stock prices. These studies assume that investors understand the disclosures, accept them as relevant, and have confidence in their consistency and quality [Ref.24]. Beaver and Landsman explain the relevance of studying stock prices as follows:

There are several reasons why the security price-earnings approach is relevant. First, stock prices are commonly viewed by the investment community and academic

researchers as being determined by users' perception of the magnitude, timing, and uncertainty of future cash flows. Second, because stock prices reflect users' beliefs about prospective cash flows, the relationship between stock prices and earnings can be investigated now without waiting for the passage of time. Third, because stock prices are conceptually linked to prospective cash flows, the difficulty of disentangling actual cash flows from expected cash flows does not exist. Fourth, the stock price-earnings relationship has been the subject of many empirical studies over several years. [Ref.25]

However, lack of a complete theory which links stock prices and accounting information is stated as a major limitation of this kind of study. Further, inflation information may be relevant for other purposes even though it may be irrelevant in relation to stock prices [Ref.22].

#### **1. Beaver and Landsman**

Beaver and Landsman investigated the ability of the Statement No.33 disclosures to explain stock prices and the changes in stock prices in their FASB-sponsored research in 1983. The data included the disclosures of 731 companies for the years 1979 through 1981. By using these data, they constructed six "Statement No.33 earnings variables" which were defined as follows: "income from continuing operations under current cost, income from continuing operations under current cost plus purchasing power gains, income from continuing operations under current cost plus gross holding gains, income from continuing operations under current cost plus purchasing power gains plus net holding gains, income from continuing operations under constant dollar, and income

from continuing operations under constant dollar plus purchasing power gains" [Ref.25].

In their preliminary analysis, they examined the correlation between security returns and historical cost earnings and also between security returns and the Statement No.33 earnings variables. They found that percentage changes in stock prices were more highly correlated with percentage changes in historical cost earnings than with the percentage changes in the Statement No.33 variables. In the next step, they tried to determine whether "Statement No.33 data provide information content (in this context, explanatory power) over and above that provided by historical cost data" [Ref.25]. To explore this, they designed a two-stage regression analysis. In the first stage, they regressed the Statement No.33 variables on historical cost earnings to obtain residual variables. In the second stage, they regressed security returns on these residual variables and on historical cost earnings. Again, historical cost data showed a stronger relationship to security returns than the Statement No.33 variables did.

They repeated the same statistical test to determine whether these variables could explain the level of stock prices rather than the yearly changes in stock prices. They thought that yearly changes in stock prices might not be large enough to reflect an effect of inflation information and that

cumulative changes over time could be large enough to indicate such an effect. The results didn't indicate any impact, however.

Beaver and Landsman concluded that "once historical cost earnings are known, The Statement No.33 earnings variables provide no additional explanatory power with respect to differences across firms both in yearly stock price changes and in the level of stock prices, and even after any one of the Statement No.33 variables is known, knowledge of historical cost earnings still provides explanatory power". [Ref.25] After considering the user indifference to Statement No.33 disclosures and the availability of inflation information from other sources, they stated three possible interpretations consistent with their results:

1. An adjustment of stock prices for inflation was not being made or was too small to detect empirically because unanticipated price changes were not material in 1979 through 1981.
2. If an adjustment was being made, Statement No.33 disclosures were unrelated to those adjustments, possibly due to errors in the measurement of current costs.
3. An adjustment was not being made due to users' slow learning. [Ref.25]

They drew a distinction between anticipated and unanticipated inflation and stated that a different result could be possible if unanticipated inflation was high enough to overcome the measurement errors or if these errors could be reduced by modifying the Statement No.33 disclosure requirements. [Ref.25]

## **2. Bubnitz, Frecka, and McKeown**

Bubnitz, Frecka, and McKeown conducted research in the same direction as Beaver and Landsman in 1985. They added 1982 and 1983 Statement No.33 disclosures to the previous research data and employed additional variables to include the effects of industry differences among the companies. They also regressed security returns on the Statement No.33 earnings variables and historical cost earnings, but did not use a two-stage approach like Beaver and Landsman . They reported that these variables had significant explanatory power over historical cost earnings. Inclusion of two additional years, the use of new variables, and the changes in statistical methods were stated as the possible causes of the different result. [Ref.25]

## **3. Bildersee and Ronen**

Bildersee and Ronen argued that focusing on earnings measures to determine the information content of inflation disclosures was wrong. They claimed that current cost data could be used to measure the real growth of a company and the association between real growth and security returns could provide a better assessment of current cost disclosures. They examined the current cost disclosures of 136 companies for 1980 and 1981. By utilizing these current cost data, they constructed two productive activity growth measures. The first variable was related to continuing operations, whereas the second was related to the potential future productive activity

growth associated with expenditures on capital assets. These variables showed a slightly stronger relationship with security returns than historical cost growth variables did. The authors suggested that current cost data could reflect real growth information that might not be contained in historical cost statements. [Ref.23]

#### **4. Schaefer**

In 1984, Schaefer examined the usefulness of the Statement No.33 current cost disclosures in forecasting security returns. The study included 121 companies for 1979, and 262 companies for 1980. By regressing the percentage change in current cost income on the percentage change in historical cost income, he determined the residual current cost variables which represented the information content of current cost disclosures. In the same manner, he also determined the information content of dividends by annualizing first-quarter dividends and comparing this forecast with the actual dividends paid during the year. Statistical tests showed that the information content of the current cost income variable diminished as the information content of the historical cost income and dividends were added in the forecast model. Hence, current cost income changes didn't prove to be more informative than historical cost income and dividend changes in forecasting security returns. [Ref.23]



## **5. Swanson, Shearon, and Thomas**

In 1985, Swanson, Shearon, and Thomas employed four different forecasting models to determine the most accurate one in forecasting one year's future current cost earnings. The study included 129 companies from nine industrial sectors. The data consisted of the ASR 190 disclosures from years 1976 through 1978 and the Statement No.33 disclosures from years 1979 through 1981. The model which used the analyst's forecast for sales and current cost profit margin along with the analyst's forecast of a proportional change in historical cost profit margin provided the most accurate forecasts for eight of nine industrial sectors. The results showed that the inclusion of historical cost data increased the accuracy of current cost income forecasts. [Ref.22]

## **6. Morris and McDonald**

Morris and McDonald studied the relationship between current cost disclosures and systematic risk in 1982. Systematic risk is defined as the portion of a security's risk which cannot be avoided through diversification. The risk of a security is measured by the standard deviation of its returns in the past periods and is reflected in the security's market price. The Capital Asset Pricing Model (CAPM) is a method which specifies the relationship between a company's risk and the required rate of return on its stock when held in a well-diversified portfolio. This relationship is represented by beta in the calculations. The return on a stock must

increase as its risk increases. As an alternative to CAPM, Arbitrage Pricing Theory (APT) includes some other factors in addition to systematic risk to determine required rates of return. These factors mainly include interest rates, gross national product, and inflation. Morris and McDonald contended that the effects of inflation could be included in the beta of CAPM or as a separate factor in APT. They assumed that price changes contributed to a company's risk and, therefore, could not be avoided by diversification. By using current cost disclosures of 172 companies from 1979 financial statements, they constructed a variable which was equal to the ratio of the difference between historical cost income and current cost income to the historical cost of assets. They hypothesized that higher values of this variable should correspond to higher systematic risk, and in turn, to higher return on stock. The tests showed that stock returns were highly correlated with the constructed variable, and the authors concluded that the Statement No.33 current cost disclosures were impounded in stock prices. However, when Morris and McDonald repeated the same study by distinguishing between anticipated and unanticipated inflation, they reported that Statement No.33 disclosures were irrelevant rather than being impounded in stock prices. [Ref.23]

#### **7. DeBerg, Hansen, and Boatsman**

In 1986, DeBerg, Hansen and Boatsman tried to demonstrate that specific and general price changes affect

systematic risk. They hypothesized that input price changes and their effects on output prices impact systematic risk and company value through fluctuating cash flows. Their study suggested that these factors might have a value in risk assessment. Moreover, they concluded that "the specific price information may be useful when there is little or no general inflation, and general inflation may affect systematic value and company value even when a company experiences proportionate rates of price changes in inputs and outputs". [Ref.22]

### C. INFLATION DISCLOSURES AND PROFITABILITY RANKINGS

In 1986, Smith and Anderson conducted a study to determine whether the use of the Statement No.33 current cost and constant dollar income figures, instead of historical cost income, had an effect on company and industry profitability rankings. Their statistical tests used the 1980 inflation disclosures of 328 companies which were further classified into 32 industrial groups. They used four different bases to determine the rate of return on common stockholders' equity: historical cost, constant dollar, current cost, and combined current cost and constant dollar. The rate of return on common equity for each basis was calculated as follows:

1. Historical cost. Preferred dividends are deducted from net income from continuing operations to give income available to common equity which, in turn, is expressed as a percentage of the book value of common equity.
2. Current cost. Current cost income less preferred dividends is stated as a percentage of the current cost

net assets reduced by the book value of preferred stock....

3. Constant dollar. Constant dollar income less preferred dividends is augmented by the purchasing power gain or loss on net monetary assets on the premise that the effects of such gains or losses accrue to providers of equity capital. The result is stated as a percentage of the constant dollar net assets reduced by the book value of preferred stock....
4. Current cost and constant dollar. Current cost net income less preferred dividends is augmented by the purchasing power gain or loss on net monetary assets and also by the holding gain or loss on property, plant and equipment, and inventories, net of general inflation. The result is stated as a percentage of current cost net assets reduced by the book value of preferred stock.... [Ref.24]

Average rates of return for 32 industrial groups were calculated under each basis and a new ranking was made according to these rates of returns. The statistical tests showed that the relative performances of industry groups were significantly changed by the use of different bases. In the second part of the study, the authors derived some ratios from historical cost data to determine whether the changes in the rankings could be explained by using the information readily available in historical cost financial statements. They found that these changes couldn't be substantially explained by using the ratios derived from historical cost data. They concluded that "additional dimensions of performance or changes in corporate position are revealed by inflation accounting, beyond those revealed by contemporaneous historical cost information." [Ref.24] These findings also imply that not all industrial sectors are affected by

inflation in the same manner and the use of inflation accounting methods instead of historical cost accounting may affect the resource allocation in the economy as a result of changes in relative profitability.

#### **D. COST-BENEFIT ANALYSIS OF INFLATION ACCOUNTING METHODS**

In 1984, Espahbodi and Hendrickson conducted a study to assess the net social benefits associated with three alternative inflation accounting models: general price-level adjusted (i.e., constant dollar) historical cost (GPLA), current cost (CC), and current cost-general price-level adjusted (CC-GPLA). CC-GPLA income was measured by adding purchasing power and holding gains and losses to current cost income. They also modified Statement No.33 current cost income to include holding gains or losses. The researchers used financial reports of ten steel and eleven chemical companies from 1964 through 1979. They explained that both steel and chemical industries mainly used long-lived physical assets and such industries were believed to be affected by inflation more than the others.

The study was conducted in six main steps. First, historical cost financial statements were restated for specific and general price level changes. In the second step, they forecast the societal rate of return for each company under each inflation accounting model for the years 1977, 1978, and 1979. The societal rate of return was described as "income before deducting interest and income taxes divided by

total assets net of accumulated depreciation, depletion and amortization". In the third step, the companies were ranked according to these rates of return for each of the three years and those with lower rates of return were eliminated. "Lower rates of return" were defined in four separate tests as the lowest 10%, 20%, 30%, and 40%, successively. Then, total resources available to the industry were allocated among the surviving companies under each model. In the next step, the average of the resources allocated to surviving companies over three years was calculated and restated in terms of CC-GPLA. Later, actual societal rates of return were determined for years 1977, 1978, and 1979 on a CC-GPLA basis for each company. The societal income (benefits accruing to society) for each of the four alternative accounting models was determined by multiplying the average societal rates of return by the average resources allocated to surviving companies over three years. The gross benefits of GPLA, CC, and CC-GPLA were calculated by subtracting the societal income under the historical cost model from the societal income under these three inflation accounting models. In the fifth step, the cost of applying each inflation accounting model was estimated from a survey of company executives. In the last step, the net benefits of each inflation accounting model was determined by subtracting the estimated cost from the gross benefits.

When compared according to these net benefits, the CC-GPLA model was superior to GPLA and CC models. For the

chemical industry, the CC model was found to be inferior to the GPLA model, but whether this was valid for the steel industry depended on the assumptions made for the elimination of companies in the third step of the study. [Ref.26]

A. W. Stark criticized Espahbodi and Hendrickson on the grounds that their assumptions about the re-allocation of resources and the determination of benefits under alternative accounting models were unrealistic. However, he congratulated the authors for attempting such an analysis, since such a comprehensive cost-benefit analysis had not been attempted before and it could stimulate the discussion "on the effects of accounting measures on the social, as opposed to private, value of the distribution and profitability of resources". [Ref.27]

#### **E. SUMMARY**

Most of the studies here have failed to provide strong evidence that security returns are affected by inflation information [Ref.22]. However, Bublitz, Frecka, and McKeown stated that inflation information had significant explanatory power over historical cost data. Bildersee and Ronen employed an indirect approach to show the usefulness of current cost data. DeBerg, Hansen and Boatsman pointed out the potential value of inflation information in evaluating systematic risk. It appears that research design has a significant effect on the results of the studies. This situation highlights the need for more robust research methodologies and further research

for exploring the usefulness of inflation information in explaining stock prices.

On the other hand, Smith and Anderson showed that relative profitability of industries was significantly affected by the use of alternative accounting methods. If some inflation accounting method replaces historical cost method, this will affect the allocation of resources in the economy. From an economic efficiency perspective, Espahbodi and Hendrickson conducted a cost-benefit analysis of alternative accounting methods. Such an approach has the merit of enlarging the perspective of the discussion on inflation accounting.

All of these studies relied on the FASB Statement No.33 disclosures and the guidelines provided by this statement. Negative conclusions about the usefulness of inflation information can be attributed to the potential deficiencies in the provisions of this specific standard. Beaver and Landsman specifically pointed out the possible measurement errors due to excessive discretion in determining current values [Ref.25]. Another main issue is the manner in which the inflation information is presented to the users, such as primary, supplementary, or experimental. These factors largely determine the level of use in practice, and in turn, the level of the impact on economic decisions.

The results of the studies on the usefulness of inflation information do not provide a clear-cut conclusion. Since



deficiencies of historical cost accounting are well recognized, the search for a more accurate accounting method seems to continue and empirical studies constitute the main tool in the evaluation of alternative accounting methods.

## VI. CONCLUSIONS

Inflation decreases the ability of historical cost financial statements to provide a fair presentation of business performance. While monetary assets lose their purchasing power during inflation, the book values and depreciation charges for non-monetary assets fail to reflect the real value of the business and the real costs incurred in operations. Understated costs lead to overstated income, and excessive income taxes and dividends may erode the productive capacity of the business. However, holding net monetary liabilities gives rise to a purchasing power gain, since monetary liabilities represent a fixed amount of money. Thus, companies prefer to have more monetary liabilities than monetary assets, which might not be desirable without inflation.

Two important aspects of inflation are its magnitude and the level of anticipation. If perfectly anticipated, inflation can be incorporated in business decisions in advance, so as to neutralize its effects. On the other hand, variability of inflation rates increases with its magnitude; and unanticipated inflation becomes more likely. The basic problem stems from the fact that money becomes an elastic measuring unit under inflation. As a result, business performance as indicated by historical cost financial statements, which

assume that money is a stable measuring unit, may lead to inefficient or wrong decisions by investors and management.

As a response to the distortional effects of inflation on financial reporting, two main methods emerged in the accounting literature. As the first method, constant purchasing power accounting focuses on the decline in the purchasing power of the monetary unit. It is assumed that the magnitude of this decline can be determined through general price indices, and the historical cost accounts can be adjusted to neutralize the distortional effects of inflation. The overall objective of this method is to determine the real changes in the well-being of a business, and to exclude all effects resulting from the decline in the value of money. However, the prices of different assets may change at different rates and in different directions, and businesses which own different assets may not be affected by the inflation in the same manner. This situation focuses on the distinction between constant purchasing power accounting and the second method, current cost accounting.

Current cost accounting attempts to account separately for each specific price change. The current values of assets are determined mainly through current market prices, and historical costs are replaced with the current costs which are derived from these current values to measure business performance. However, determination of the current values may involve a high degree of subjectivity due to incomplete

markets for some assets and technological changes. Thus, potential subjectivity can be stated as the main weakness of the current cost accounting method, which may cause inconsistent valuation of assets across companies. If this weakness can be eliminated, the current cost method can provide a better valuation of non-monetary assets than the constant purchasing power method. However, constant purchasing power method measures the purchasing power gains or losses on monetary assets and liabilities in an objective manner by using publicly provided general price indices. Such gains or losses are ignored by current cost accounting. A proper combination of these two methods seems to render a better measure of business performance.

In September 1979, the FASB published Statement No.33, which was the first inflation accounting standard put into practice. This statement required certain publicly held companies to disclose both constant dollar (i.e, constant purchasing power) and current cost information as a supplement to their historical cost financial statements. The board stated the lack of consensus on a single method as the cause of requiring both kinds of inflation information. It also announced that the requirements were experimental. Later, surveys showed that the users of financial statements were indifferent to the disclosures. This result was attributed to the experimental and supplementary nature of the disclosures.

Compliance with the Statement No.33 was made voluntary in 1986 after inflation decreased to lower levels.

The British standard announced in 1980 required certain large entities to present current cost financial statements and balance sheets along with their historical cost financial statements. This standard was downgraded to a non-mandatory status in 1985. The British standard didn't include any provision for purchasing power gains and losses, and this was stated as the main cause of its failure to gain general acceptance.

The Canadian Institute of Chartered Accountants published its inflation accounting standard, which was very similar to the U.S. standard. Because compliance with the standard was voluntary, it found little application. The U.S. and the Canadian standards displayed a more comprehensive approach than the British standard, which limited itself to the current cost method.

After publishing Statement No.33, FASB sponsored a study by Beaver and Landsman which tried to determine the information content of inflation disclosures in explaining stock prices. In this comprehensive study based on the Statement No.33 disclosures for the years 1979 and 1980, the authors concluded that these disclosures didn't have any additional power to explain stock prices over and above the data already available in historical cost financial statements. However, Bublitz, Frecka, and McKeown conducted

another study in the same direction, and they stated that inflation disclosures had significant power to explain stock prices.

Many other studies have been conducted to find a relationship between stock prices and Statement No.33 disclosures during 1980s, and most of them failed to show strong evidence that stock prices were affected by the disclosure of inflation information. User indifference, potential errors in the preparation of the disclosures, and the lack of a complete theory that linked stock prices and financial reports were stated as possible explanations of these results. Furthermore, research methodologies seem to have a significant effect on the results. With a different approach, Smith and Anderson showed that the relative profitability of different industries changed significantly by the use of inflation accounting models. This result implies that not all businesses are affected by inflation in the same manner, and the use of inflation accounting methods instead of the historical cost method may affect resource allocation in the economy.

Espahbodi and Hendrickson conducted a cost-benefit analysis of alternative accounting models. They concluded that the inflation accounting model, which included the purchasing power gains or losses on monetary assets and the holding gains or losses on non-monetary assets net of inflation in business

income, provided the most beneficial allocation of resources in the economy for the society as a whole.

Interest in inflation accounting has fluctuated with inflation rates. Such an attitude seems to neglect two important dimensions of the inflationary effect on financial reporting. First, studies showed that distortional effects extend over longer periods than the duration of high inflation. Second, even insignificant inflation rates can decrease the reliability of financial statements if compounded over years. Since business operations could normally cover several decades in most cases, effects of inflation do not appear to be negligible. Financial statements cannot be perfectly objective since they are prepared by the company whose financial position is being reported. Inflationary distortions to the measurement of business performance may add to the inherent uncertainty faced by investors and decision makers. Thus, Inflation accounting methods have the potential to improve the usefulness of the information provided by financial statements. Inflation accounting techniques may need further refinements, and users may need further education and experience with them.

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