

FINANCIAL ACCOUNTING IN AN
ERA OF INFLATION

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ABSTRACT

This thesis examines the impact of inflation of publicly reported financial statements. This involves an analysis of the measurement distortions wrought by changing price levels, an examination of the problems that have resulted from these distortions, and an evaluation of possible reforms.

First, financial accounting is presented from within an information systems framework and the objectives and principles of financial accounting are discussed. Then attention is directed primarily at the problems of conventional income measurement and asset valuation processes. Specific topics covered include: the neglect of holding gains and losses on monetary items; the impact of different inventory methods; and the inadequacy and inaccuracy of current depreciation practices. The emphasis then shifts to an examination of the impact of these distortions on financial statement analysis. Measures of profitability, efficiency, and solvency are discussed. Also explained are the problems of inter-temporal and cross-sectional comparisons. Finally, two proposed reforms, price-level accounting and current-value accounting, are evaluated against a normative standard. Both proposals are found to have the potential of yielding useful and valuable information if properly implemented. However, because of the problems of feasibility and verifiability, the author prefers the adoption of price-level accounting.

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I. INTRODUCTION

Objectives and Scope

Certainly one of the most significant developments in the world's economy in recent times has been the resurgence of rampant inflation. It has caused tremendous problems for corporate planners and headaches for the everyday housewife. Its repercussions have been felt far and wide and have been manifested in a seemingly infinite variety of ways. Perhaps nowhere, however, has its impact been greater than on the financial reports of business enterprises. Rapid price changes have created measurement distortions which, in turn, have resulted in a growing lack of credibility and usefulness of traditional financial accounting. The objective of this thesis is to examine these distortions and the many managerial problems that have resulted from them, and then evaluate a number of "reforms" that have been proposed to ameliorate the situation.

If, at times, the analysis seems to be somewhat schizophrenic, it is because two different perspectives will be used. The first viewpoint will be that of the information systems analyst. In this role, the emphasis will be on the various problems of gathering, processing, and presenting information. The concerns will range from the rather mundane issues of system cost and implementation to the more difficult and theoretical problems of system objectives, measurement distortions, and managerial implications. The other perspective will be that of the user of financial accounting information. Here again the concerns will be wide-ranging, from the format and content of financial statements to the conflicting interests of different users.

Though most of the analysis will consist of a general examination of the various issues, at times a formal mathematical modeling approach will be utilized. Where appropriate, specific examples of actual or hypothetical firms will be employed to illustrate the crucial points.

Perhaps at this time it would be helpful to provide a summary of the remainder of this paper. The first order of business will be to define the important terms and concepts. This will involve a discussion of exactly what is meant by "inflation" and "information". Information systems will be explained and financial accounting will be presented from within an information systems framework. Once this groundwork has been laid, there will follow a discussion of the objectives of financial statements. This will involve an examination of the principles and values that underly the accounting discipline, and a presentation of how they are applied to the construction of specific reports. Once this conceptual framework has been established, the analysis will proceed to explain the many distortions that have resulted from changes in the general price level. Though many specific issues will be considered, the two broad areas in which they will fall are income measurement and asset valuation. Once the distortions and problems have been exposed and explained, the analysis will switch to examining the morass of misperceptions, confusion, and frustrations that the distortions have caused. Specific types and classes of financial measures will be discussed, particularly with regard to how they are incorporated into the decision making process. Then, with the need for change thoroughly understood, the focus will shift to an evaluation of a number of proposed reforms. A set of criteria for judging the desirability of a given change will be established, and then the

various proposals will be examined against this standard. Finally, a summary of the findings and conclusions will be made.

Important Economic and Information Systems Concepts

What is meant by "inflation"? Recently, the word seems to have acquired a myriad of inaccurate connotations. It has become an expedient catch-all term for representing all of our economic ills. For the purposes of this study, however, a more precise and consistent definition is needed. Thus, the following will be used: inflation is an economic condition characterized by a broad and pervasive rise in the general level of prices.

There are many theories that have been advanced to try to explain the cause of upward price movements. The two most popular and widely accepted ones are "demand-pull" and "cost-push." The first hypothesizes that excessive demand or a rapid rise in the money supply results in "too many dollars chasing too few goods," and the free market responds by raising prices in an attempt to move towards a new equilibrium point between supply and demand. The latter theory is somewhat more complicated, but simplified its reasoning goes something like this. As prices rise, workers (particularly labor unions) press demands for higher wages to make up for their lost purchasing power. Management accedes to their demands and then passes on these higher costs to the consumers. Thus prices continue to rise, workers again ask for higher pay, and prices spiral upwards. Without a recession, it would appear to be a vicious circle. Regardless of its cause, however, there are a number of important points to bear in mind when discussing inflation-related issues.

First, inflation must be measured and this measurement process is not an easy task. In the United States, this job has primarily been the responsibility of the Bureau of Labor Statistics of the Department of Commerce. This organization's methodology is too complex to be presented in full detail here but basically it consists of a periodic (usually monthly) determination of the cost of purchasing a particular "market basket" of goods and services. The intention is to represent, as feasibly as possible, what the "average" American household is buying. This index is called the Consumer Price Index, or CPI. (Other price indexes are also computed from other market baskets, the most notable being the Wholesale Price Index, and the Gross National Product Implicit Price Deflator. The former is an attempt to provide a measure of price changes of raw materials, while the latter is perhaps the broadest measure of inflation, and the one used to compute the "real GNP".) As one might expect, there are a number of significant problems with this methodology. Perhaps the most important one is the long time lag between the restructuring of the market baskets (the composition of the market baskets are generally revised approximately every decade). Also, as is characteristic of most types of statistical averages, probably very few American families actually buy the exact same set of goods and services that make up the CPI market basket. Nor do many businesses buy all the components of the Wholesale Price Index basket. Another critical problem is that many economists believe that quality improvements are a significant factor in boosting prices but these quality changes are not recognized explicitly in the calculations. Nevertheless, the current efforts of the Bureau of Labor Statistics are an honest attempt to provide some very crucial and

difficult-to-obtain information.

The second point to remember is that not all prices change at the same rate of speed. This feature has been illustrated by Hendrikson through his description of three different types of price level changes: general, specific, and relative.¹ General price level changes "reflect increases or decreases in the value of the monetary unit ... caused by changes in the supply or velocity of money that are greater or less than the changes in the total supply of goods and services in the economy, or by an imbalance in the total supply and demand for goods and services in general."²

General price changes are the aggregate of all the specific price changes. A specific price change, as the phrase implies, is defined as a change in the price of a specific product or service. This type of change usually results from changes in consumer tastes, production technologies, or the availability of supplies.³ Finally, then, there are relative price changes. These "reflect the change in the structure of prices or the change in the price of one commodity relative to the price of all goods and services."⁴ Thus, a given product's relative price change can be measured by the ratio of its specific price change to the general price level change. The crucial thing to bear in mind here is that inflation can have a significant redistributing effect on income and wealth. Those individuals and organizations whose market basket costs rise at a slower rate than the value of their assets and income streams will become relatively better off. This redistribution can occur across geographical, income class, or industry lines. However, although at first glance inflation appears to be what economists call a "zero-sum game", its disruptive

effects and its constraining impact on growth have led most public policy officials to believe it is clearly an undesirable condition.

Closely related to the issue of inflation is the concept of the time value of money. This concept embodies the idea that the ownership of and right to use monetary assets for a period of time has some positive value, or conversely, not exercising this right incurs an opportunity cost. This value (or cost) is derived from two primary sources. First, because of inflation and the corresponding decline of purchasing power over time, the repayment of debt is done with less valuable dollars than those that were borrowed. Thus, some portion of a discount rate is attributable to an attempt by lenders to compensate for the purchasing power loss. The other portion of the discount rate can be attributed to what economists and financiers call the "real interest rate". This rate is what a security would yield if it were completely risk-free and there was no inflation. Thus, it represents the true price of borrowing money for a period of time when repayment is absolutely ensured in dollars of equal purchasing power.

Now that the definition of inflation has been examined, the next task is to clarify what is meant by information, and information systems.

Information is one of those words that is so basic and fundamental that it is almost impossible to define without resulting in a recursion of definitions, that is, definitions that employ words that are directly or indirectly defined by the original word. However, without getting into a semantical debate, we shall think of information as "knowledge acquired in any manner" (however we must not automatically assume that such knowledge has the connotation of validity).⁵ What then is an "information system"?

Here again, the term "system" seems to have an innumerable number of meanings. We shall think of a system as "a set of objects, facts, principles, etc. classified or arranged in a regular, orderly form so as to show a logical plan linking the various parts."⁶ We shall further assume that a system is expected to perform certain functions and serve some specified purpose. Thus, an information system is a set of components, procedures, and principles used to gather, process, present, and disseminate information. With this definition, it is fairly easy to conceptualize financial accounting as an information system. It has components, procedures, and principles which it employs to gather, process, present and disseminate certain types of financial information. The components are the people who operate the system and the various journals and ledgers (both manual and computerized). The procedures are the various methods used to record transactions, classify, aggregate, and summarize the data, present the results in the form of financial statements, and distribute the reports to all interested parties. However, the real key to the entire financial accounting system, and the area that is of most interest to us here, is the set of principles and guidelines which underly the financial accounting discipline and determine what sort of procedures are appropriate.

Objectives and Principles of Financial Accounting

The best approach to understanding these principles and concepts is to try to analyse the objectives of financial accounting and its product, financial statements.

What are the objectives of financial statements? The most appropriate manner in which to deal with this complex issue is to look at the financial

report generation process in reverse. That is, first one should look at how financial statements are used by decision makers. Once an understanding has been gained as to the purpose they serve and the functions they are expected to perform, one can then state, within a normative context, what these reports should contain. Then, having decided upon what the proper contents ought to be, the proper procedures for providing these contents can be developed.

The first task, then, is to examine how and why financial statements are used. Even here the problem isn't so clear-cut. There are many different types of individuals and organizations that use publicly reported financial data. And they use it in vastly different ways. Government officials need information for developing and enforcing regulatory and antitrust policies. Financial data also plays an important role in many labor negotiations and other legal proceedings. But, the most common function that financial reports serve is to provide information to investors. These may be individual stockholders, fund managers, or financial institutions trying to decide whether or not to purchase, sell, or hold equity in some corporate enterprise. It may be a corporation engaged in an acquisition analysis. Or, it may be a financial institution trying to make a judgement regarding a client's credit worthiness.

All these types of decisions -- public policy, legal and contractual, and investment -- are economic decisions. That is, they all involve the allocation of society's scarce resources in the production of goods and services, which in turn, is intended to improve the welfare of mankind. Therefore, as the APB's Statement #4 remarks: "The function of accounting

is to provide quantitative information, primarily financial in nature, about economic entities that is intended to be useful in making economic decisions."⁷ Furthermore, most of these decisions concern contemplated actions and policies for the future. Thus, to make these decisions, the decision-makers must have some basis for making predictions. This makes imperative a sound understanding of the present condition and recent history of the firm. Thus, as Arthur Andersen & Company states:

"The overall purpose of the financial statements is ... to communicate information concerning the nature and value of the economic resources of a business enterprise, the interest of creditors and the equity of owners in the economic resources, and changes in the nature and value of those resources from period to period."⁸

Thus, "financial statements are vehicles for conveying information concerning the wealth (and changes in wealth) of a business entity."⁹

But what is wealth and how should it be measured? For our purposes we shall think of wealth as economic resources owned by the firm which can be sold for some positive value in the marketplace or which contribute to the generation of earnings. Earnings, in turn, can be conceptualized as either changes in net wealth, or as the generation of cash or cash equivalents from the accomplishment of commercial transactions. Thus, the user of financial statements should want to know what economic resources a firm owns, what others it has at its disposal, and how well it is employing these resources in the generation of earnings. Other important areas of interest to users of financial reports are measures of liquidity, solvency, and efficiency. Thus, the information included in financial reports ought to be able to provide the user with an adequate amount of information to make sound judgements regarding these various characteristics of the enterprise.

Now that the objectives and expectations of financial statements have been defined, it is time to try to provide some guidelines as to what kind of information should be included in these reports. What attributes should publicly reported financial data have?¹⁰

First and foremost, the information should be useful. This is obvious, but it is much too simplistic. One must dig deeper into what makes information useful. To be of value to a reader of financial reports, the data must be understood by him. This implies that the reader understands how the statements were compiled, and is aware of all the assumptions that were made in the computation process. Also, the methods by which information is gathered and processed should be as free as possible from biased and subjective judgements. This constraint does not imply that the interpretation of the data can't be subjective in nature, but it does require that the origin or source of information included in the reports be verifiable by independent sources which are external to the firm. Also, the information should not be affected by the desires or judgements of the individuals responsible for the creation of the financial statements. The concern here is that without safeguards, financial reports could be rendered worthless because of the unreliability of their content. Usefulness is also enhanced if the reports are consistent in their application of accounting principles and policies over different periods of time. A corollary of this idea is that since economic decisions involve the process of choosing among alternative courses of action, consistency in financial reports is desired, not only over time, but also among different firms during the same time frame. Thus, comparability of reports is an important

goal. Also, data can only be useful if it is relevant and material to the economic decisions that need to be made. Obviously, what constitutes relevance and materiality is often a very gray area and a subject of considerable debate. In addition to the desirability for usefulness, there are a number of other concepts that have been built into the structure of financial accounting. Among the most important of these is the accrual concept. As Anthony explains,

"the essence of the accrual concept is that income is measured by operating transactions that affect owner's equity, and only by such transactions Any increase in owner's equity resulting from the operation of the business is called a revenue. Any decrease is called an expense. Income is therefore the excess of revenues over expenses."¹¹

Supplementing the accrual concept, is the concept of realization. The issue here is when to recognize on the financial reports the occurrence of a revenue or expense. As Hendrikson and others have contended, the concept "lacks analytical precision"¹² and thus means different things to different people. However, it is generally agreed that revenues and expenses should be realized "when goods or services are furnished to the customer in exchange for cash or some other valuable consideration (usually an account receivable)."¹³ Or put another way, "realization represents the reporting of revenue when an exchange or severance has occurred ... giving rise to the receipt of cash or a claim to cash or other assets."¹⁴ This concept has very important applications. For example, the cost to a firm of producing an item does not become an expense until the item is actually sold (or written off). Until this severance, the costs of production are incor-

porated into the book value of the inventories, even though the firm's outlays of cash might have occurred many time periods ago. Thus, financial accounting does not use the timing of the cash flows in determining the net income for a period. Instead, accounting monitors "the accomplishment of major economic activities."¹⁵

Another important principle of financial accounting is that income and assets are measured in monetary units. As we shall see later, this principle, which clearly enhances comparability, is based on the assumption of a stable monetary unit. When this stability becomes non-existent, problems can result.

Yet another accounting principle which may be based on a faulty assumption is the concept of a "going concern."

"Accounting assumes that the business will continue to operate for an indefinitely long period into the future It assumes that they (the firm's economic resources) will not be sold as such but rather that they will be used in the creation of future output values."¹⁶

However, in an age when conglomeration, divestitures, and diversification are significant features of the business environment, it may be appropriate for accountants to recognize that the current economic value of a firm's assets is often an item of keen interest to its owners and its creditors.

Finally, another precept of accounting is the virtue of conservatism. The rule embodies the belief that accountants should always "anticipate no profit, and provide for all losses." As applied, the idea has tended to cause accountants to underestimate the value of assets and revenues, overestimate the value of liabilities and expenses, realize revenues somewhat later, and expenses somewhat sooner."¹⁷ Thus, as Hendrikson contends:

"pessimism is assumed to be better than optimism in financial reporting."¹⁸

All these principles and concepts constitute an underlying foundation upon which the entire structure of financial accounting rests. Their purpose is to provide a set of values and criteria against which one can evaluate the appropriateness of a procedure or treatment of a commercial transaction. However, as the Accounting Principles Board (now called The Financial Accounting Standards Board) has made clear, accounting principles must "change in response to changes in economic and social conditions, to new knowledge and technology, and to demands by users for more serviceable financial information."¹⁹ Because inflation is an economic condition, and its recent resurgence certainly represents a change in economic conditions, it is imperative that the structure and foundation of accounting be examined within the context of this change, to see if any renovation is called for. Thus, the objective of this effort is to gain a thorough understanding of the distortions and problems that have been created by inflation, and decide whether they are serious enough to warrant responsive action.

II. ANALYSIS OF THE DISTORTIONS

Objectives and Scope

The task now before us is to examine the impact and distortions that changing price levels have had on the process of computing the figures presented in publicly reported financial statements. The focus will be directed, somewhat narrowly perhaps, on the actual procedures used to generate the contents (the quantitative data) of the two most important financial reports: the balance sheet and the income statement.

Each of these reports has its own purpose and contents, and yet each is also intimately related to the other. Thus, many of the distortions that exist impact both of the reports in some way. Therefore, the analysis will not concentrate on each financial statement individually, but rather will classify each distortion by the group of accounts which it affects, and then examine the impact of the measurement problem on the usefulness of each report.

Before proceeding any further with the analysis, it is imperative at this time to briefly examine each of these two financial statements to gain a thorough understanding of their contents, purpose, and methodology.

Balance Sheets and Income Statements

The balance sheet is a financial report that "shows the financial status of the business as of a given moment of time."²⁰ Metaphorically speaking, it can be conceptualized as a financial snapshot of an organization. It consists of three classes of accounts: assets, liabilities, and owner equities.

Assets are generally those items which are owned by the firm and have some economic value. Some are monetary in nature (cash, accounts receivable, etc.) while others are physical things such as inventories or plant and equipment. Still others are aptly termed intangibles, because they represent the ownership of some valuable considerations which may not be visible but which nevertheless contribute to the operation of the business. Regardless of an asset's nature, however, in keeping with the principles of accounting it is measured in monetary units. The value at which it is recorded (or "booked") is usually its historical cost, that is, the purchase price (in cash or other assets) at the time the asset was acquired. (The major exception to this is when an asset's market value has fallen below its historical-cost-based book value and thus the principle of conservatism requires a revaluation to current market value.) Generally speaking, the classification of an item as an asset is fairly clear-cut, but there are a few areas, most notably in the intangible section, where certain accounting practices remain controversial and still require a considerable amount of subjective judgement.

Liabilities are claims by outside entities (all organizations and individuals except the firm's owners) against the assets of the enterprise. They are usually, but not always, directed against the firm as a whole rather than against any specific group of assets. These claims come from a variety of sources. Employees' wages become a liability as they accrue and continue to exist until they are paid. Similarly, trade credit extended to a firm by its suppliers represents a legal claim until it too is paid. Likewise, accrued but unpaid taxes are a liability. For many

businesses, however, the major types of liabilities are short- and long-term loans from financial institutions and publicly-placed bonds. Like assets, all liabilities are measured in monetary units and are usually valued at the amount owed. Here, too, the classification process is fairly straightforward. However, some new forms of financing, most notably leasing, have stirred up considerable debate regarding the appropriateness of certain accounting practices.

Owners' equities, then, are the claims on a firm's assets by its owners. By owners, we mean those who have provided the firm with equity capital, i.e. stockholders. Thus, this section of the balance sheet lists the revenues the enterprise received from the issuance of common and preferred stock. This section also contains an account called retained earnings which represents the aggregation of all past earnings which have not been distributed to the stockholders in the form of dividends. Thus, the owners' equities should equal the residual book value of the firm once it retires all of its debt and other financial obligations. However, it is important not to confuse a firm's book value with its market value (usually measured as: total number of shares outstanding times the current market price per share). The latter figure, which is rarely presented in financial statements, is heavily influenced by the market's expectations of the firm's future growth opportunities and the riskiness of its current operations. Such expectations may have little to do with the historical cost of a firm's assets.

It is time now to move on to the income statement. This financial report is a summarization of all the firm's revenues and expenses that have accrued and been realized during the accounting period. Its primary objec-

tive is to measure net income (or loss), that is, the difference between revenues and expenses for a given period of time. For the typical industrial organization, revenues would primarily consist of receipts from the sale of merchandise or the provision of services. Its expenses would be the costs of producing the goods and services that were sold, as well as the many indirect and overhead costs of administration, marketing, etc. Also, the amortization of the cost of the fixed assets (depreciation) is considered an expense. In addition to these so-called operating expenses, there are certain types of transactions that can occur which are classified separately because of their unusual or non-recurring nature (e.g. the gain or loss from the sale of fixed assets, the write-off or a line of business, etc.). Such transactions are commonly called extraordinary items. Net income, then, is the residual amount that remains. Usually, some of this income is distributed to the shareholders while the remainder is retained in the business to help finance future growth. Thus, income statements are an important source of information to investors about the firm's current efficiency and its future growth potential.

An important thing to recognize is that the common denominator of both these financial reports is net income. The assets listed on the balance sheet are not generally looked at as separate pieces of economic resources but rather as an amalgamation of carefully selected items which are being used collectively to generate income. Likewise, the sophisticated financial analyst will see in the liabilities section, not merely a group of debts and financial obligations, but rather a combination of financial tools and instruments which are being employed to increase lever-

age and hopefully improve the economic returns to the stockholders. For obvious reasons, the focal point of any income statement is the figure representing net income. The rest of the statement is an attempt to explain how the firm used the resources at its disposal to generate that income.

Profits -- What are They?

Because the generation of earnings (or profits) is the primary function of an enterprise, and thus the major focus of this analysis, it is important to understand what profits are and how they can be measured.

The word "profit" means many different things to different people. To a Marxist, profits are the result of the exploitation of the working class by the owners of the means of production. To a financier, profits may mean the expected return required by investors to assume a given amount of risk. To an economist, profits are returns to risk, managerial expertise, and market power (monopoly rents), and also returns resulting from deviations from long-run equilibrium conditions. To most businessmen and accountants, however, profit is simply the excess of revenues over costs.

Concepts of Income Measurement

Since there is such a wide variety of perspectives as to the source of profits, it isn't surprising, therefore, that there isn't universal agreement on how to measure them. The two major views that will be presented here are the capital maintenance approach and the operational (or transactional) approach.²¹

The underlying concept of the first method is Adam Smith's definition that income is the amount that can be consumed without encroaching upon capital, including both fixed and circulating capital.²² Applying

this idea to the typical business enterprise, one could measure the income for a period as the change in the net wealth of the firm adjusted for the dividend payments. The problem arises in trying to determine net wealth. A number of methods have been suggested, including: 1) the capitalization of the expected cash flows with the change in net wealth measured as the change in the net present value of this projected income stream; 2) the change in the aggregated liquidation value of a firm's assets less the cost of retiring all of the firm's debt; 3) the change in the market value of a firm's total outstanding stock; and 4) the change in the firm's value as measured by input costs (less depreciation) for non-monetary assets plus current market value for monetary assets, less the retirement cost of all liabilities. Of all these methods, the one that is closest to the one accepted in practice is the fourth, primarily because of its foundation in historical cost as a measuring standard.

The second method of measuring income is the operational approach. This approach "focuses on a description of the activities of a firm ... income is assumed to arise when certain activities or events take place."²³ Unlike the futuristic orientation of the capital maintenance approach, the emphasis here is on the accomplishment of events rather than the expectation of their occurrence. Specifically, this measurement technique is based on an analysis of the various commercial transactions in which the firm has been involved during the period. Asset and liability valuations are changed only as a result of these transactions. It is this measurement technique which most fully utilizes the so-called matching concept, that is, this technique attempts to match revenues with their corresponding expenses. The aggregated residuals of these matches becomes the net income

for the period. Historical costs are used to measure expenses and value assets. Realization of revenues and expenses occurs only after the critical economic event has been accomplished, and can be validated. The transactions approach, then, is the more conventional and more widely used accounting method.

Methodology

Now that the groundwork has been laid, the analysis can proceed to examine the specific distortions that have occurred in financial reports. As previously explained, these measurement problems will be classified by the group of accounts which they impact. An attempt will be made to combine together all the accounts which relate to each other in some functional way (e.g., depreciation with fixed assets). Thus, in effect, the analysis will be divided into an examination of relationships (and those relationships' impact on net income) rather than a separation solely on the basis of account class. Where needed, a definition and brief description of current accounting practice will be provided.

Concept of Holding Gains and Losses

An important idea which will play a significant role in the analysis is the concept of holding gains and losses. A holding gain is an increase in real economic welfare that accrues to the owner of an economic resource whose value has risen at a rate greater than the general price level. Thus a holding gain is a manifestation of relative price level changes. For example, suppose an individual owns an item which has a sale price of \$100 at time t . If during the next time period, the general price level remains

unchanged (i.e., there was no inflation) but the selling price of the item increased to \$110, the individual would have experienced a holding gain of \$10. In other words, at the end of the period his real wealth would have increased by \$10 (as measured in beginning or end of year dollars). A dollar at the end of the period, at time $t+1$, would have less purchasing power than it had at the beginning of the period. Thus the holding gain would be less. Such a gain would be measured as follows:

$$P_t = \$100 = \text{price at time } t$$

$$P_{t+1} = \$110 = \text{price at time } t+1$$

$$g = 5\% = \text{inflation rate or percent increase in the general price level}$$

$$s = \$110 - \$100 = \$10 = \text{specific price change}$$

$$r = (110)/(100(1+g)) = 1.0476 = 4.76\% \text{ change in the relative price level}$$

$$H_t = r(P_t) - (P_t) = \$4.76 = \text{Holding gain as measured in beginning of period dollars}$$

$$H_{t+1} = H_t / (1+g) = \text{Holding gain as measured in end of period dollars}$$

Thus holding gains and losses are changes in real economic well-being that result from the heterogeneity of price changes.

Monetary Items

One application of this holding gain concept is the treatment of the ownership of monetary assets. Monetary assets are those economic resources which exist in the form of cash or can be quickly and easily converted to cash. Their primary purpose is to serve as the firm's working capital and provide operating liquidity. Because they are claims to a fixed amount of

dollars, their value in monetary terms is the same as the value in purchasing power terms. That is to say, ten dollars on December 31, 1974 had the power to purchase ten dollars worth of goods and services on that date. However, during periods of inflation, the purchasing power of a claim to a fixed amount of money will deteriorate over time. This is one of the primary reasons why someone demands interest from a bank. (The other major rationale for interest, of course, is that it should compensate the saver for foregoing current consumption and allowing his capital to be used by someone else.) The saver's hope is that the interest revenue will offset the loss of his principle's purchasing power. In other words, he doesn't want to experience a holding loss.

This concept has important implications for a business enterprise as well as for an individual. Suppose, for example, a firm has a cash balance at time t of \$100 that is earning 5% (compounded annually and the interest is paid at year-end on the average balance for the year). A year later, at time $t+1$, if no deposits or withdrawals were made, the balance in the account would be \$105 and on a conventionally generated income statement interest revenue (and thus addition to net income) would be \$5 (assuming no taxes). However, because of the decline in the dollar's purchasing power, the firm's change in real wealth would not be \$5. In fact, the change would be $(\$100)((.05-g)/(1+g))$. As Figure 1 below illustrates, reported interest income can vary significantly from the change in real wealth. The holding gain and reported interest income would be equal when the inflation wate was zero.

Holding gain or loss (in beginning of year dollars)
experienced on an initial \$100 deposit after one
year in a bank account

		@ interest rate (%)					
		0	2	4	6	8	10
infla- tion rate (%)	0	0.00	2.00	4.00	6.00	8.00	10.00
	2	-2.00	0.00	1.90	3.90	5.80	7.80
	5	-4.80	-2.90	-1.00	0.90	2.90	4.80
	10	-9.10	-7.30	-5.50	-3.60	-1.80	0.00
	20	-16.70	-15.00	-13.30	-11.70	-10.00	-8.30
			$\text{Holding Gain or Loss} = \left(\frac{1+\text{interest rate}}{1+\text{inflation rate}} - 1 \right) (\$100)$				

FIGURE 1

The impact of inflation on accounts receivable is very similar. A firm which does a considerable amount of credit sales (as opposed to purely cash transactions) is certainly losing some amount of opportunity income. By selling on credit (and assuming no finance charges are being levied), not only is the firm risking the possibility of no payment, it is also losing the revenues it could earn on the cash for the period between the time of sale and the receipt of payment. And when the cash is received it has lost some purchasing power. It is the recognition of these facts that motivates many firms to offer "sales discounts" for early payment. Disregarding the risk of bad debts and illiquidity, the ownership of accounts receivable, then, is equivalent to the ownership of a non-interest-bearing time deposit. Thus, there are two problems with the current accounting treatment of monetary items. First, it treats income as ordinary revenues rather than recognizing its compensatory nature (in other

words, conventional accounting recognizes specific price changes but not relative ones.) And secondly, at any given point in time, traditional accounting values monetary assets on their face value, regardless of their relative purchasing power. Thus comparing the monetary accounts on a firm's balance sheets for different years could be misleading, if no adjustment were made to reflect the change in real economic worth.

The situation regarding marketable securities is also similar, but there are a number of important differences. The most critical of these is that the market value of these securities can fluctuate irrespective of the inflation rate. Furthermore, these fluctuations can be sudden, unpredictable, and substantial. Thus, it should be of great concern to the financial report reader to know not only the initial cost of these securities and the length of time for which they have been held, but also their current market value. (With conventional accounting, the securities are booked at historical cost unless their market value has fallen well below their cost, and this situation is not expected to be temporary in nature.) Even when the difference between historical cost and current market value has been determined, one must still attempt to ascertain the degree to which this difference is the result of general inflation. Many capital gains are not true improvements in well-being but rather reflect the passage of time and the corresponding change in the value of the monetary unit. For example, if a firm held a security which rose in value 40% over a period of five years, while the general price level also rose 40%, the entire gain could be attributable to inflation and no change in real wealth occurred. In fact, for tax purposes, the 40% increase in value would be treated as capital gains income and taxed as such so that a negative

change in welfare could result.

In summary, then, one can state that conventional accounting practice only attempts to incorporate specific price changes into the process of computing net income. It disregards changes in the value of the monetary unit. Such shortcomings can create misconceptions and obscure the critical operating characteristics of the business enterprise.

Just as conventional accounting neglects to recognize many of the costs involved in holding monetary assets, it also can often present a biased or inaccurate picture of a firm's financing policies. The roots of the Puritan ethic and its abhorrence of debt are deeply embedded in much of traditional financial statement analysis. The very term "liabilities" has an undesirable connotation. But modern finance has brought with it what is hopefully the age of enlightenment and the pressures are sure to grow on the accounting profession to recognize the potential rewards of the creative use of leverage.

The distortions on the liabilities side of the balance sheet originate in the same body of logic as presented in the monetary assets discussion. The difference, of course, is that from the firm's point of view they can be applied in reverse. The interest payments a firm makes on its bonds, notes, trade accounts, and loans not only reflect the firm's risk class, but also the fact that during inflationary times, the retirement of debt can be done with "cheaper" dollars. Thus, a firm which is able to borrow funds at a lower rate than the rate of inflation (whether by business acumen or luck) could experience a holding gain by merely investing the funds at a rate equal to or greater than the inflation rate.

Such a gain could be measured as previously shown. Current accounting practice only recognizes interest as a charge against current revenues. Such a treatment does not fully reflect the benefits of debt during inflationary period. Nor does current accounting practice recognize that the current value of debt-financed assets may be rising at a rate that is greater than the interest rate.

By analysing a firm's net monetary position, then, one can attempt to construct a measure of how the firm's financial structure impacts its real economic viability. Or conversely, such a method could be used to measure the distortions and shortcomings of conventional accounting practices in this area. Hendrikson suggests a procedure which: 1) matches current monetary assets against current monetary liabilities to determine the firm's net monetary current position; 2) similarly matches long-term monetary assets (long-term receivables, some marketable securities, etc.) against long-term debt (including bonds and preferred stock) to arrive at a net long-term monetary position; 3) and then computes separately a holding gain or loss figure for each of these two positions by adjusting for changes in the general price level.²⁴ The typical firm will usually have a positive net monetary current position (i.e. a current ratio greater than one) and thus during times of rising prices would experience a holding loss. However, the size and sign (plus or minus) of the net long-term positions are likely to vary widely from firm to firm, and from industry to industry. Conventional accounting measurement techniques will be most distorted for firms with very large positive or negative positions. That is to say, the reports of debt-free and highly-leveraged firms are the most distorted.

While Hendrikson's model is quite good in many respects, there are still some areas of controversy. Among the most crucial is the appropriate criteria for defining an item as a monetary asset or liability. Hendrikson states "monetary assets are claims to a fixed quantity of the monetary unit representing general purchasing power."²⁵ Thus he excludes common stock securities, inventories, and prepaid expenses. However, some stocks yield an almost risk-free and unchanging dividend and have a fairly stable price and thus closely resemble bonds which Hendrikson does consider to be monetary assets. Likewise, a leasing company may think of its inventory as a fixed income security particularly if the leases are long-term, non-cancellable, and yield an unchanging return. Finally, some prepaid expenses (e.g. insurance) represent a claim to a fixed amount of services at an already set price. On the liability side, there are also some areas of ambiguity. To Hendrikson, "monetary liabilities represent obligations to pay a fixed amount of dollars at some time in the future, regardless of what happens to the monetary unit."²⁶ While this would probably include most forms of debt, such items as convertible bonds and non-capitalized leases may not fit the definition but are certainly liabilities. Another area of controversy is Hendrikson's separation of assets and liabilities into current and long-term categories. This distinction is certainly useful to the firm's creditors and others concerned with its cash flow and liquidity situation. But for purposes of analysing the impact of purchasing power changes, it is unclear what purpose such a differentiation serves. In summary then, one can say that the composition of a firm's monetary assets and equities can have a significant impact

on how effectively it is hedged against the ravages of inflation. Furthermore, it seems reasonable to say that the traditional accounting techniques do not adequately reflect the impact of a firm's financial structure on its change in real wealth.

Inventories and the Cost of Goods Sold

The next major area where price changes have created tremendous income measurement problems is the valuation of inventories on the balance sheet and correspondingly the calculation of the cost of goods sold on the income statement. Conventional accounting generally uses historical cost as a basis for measuring the value of the flow of products into inventory. However, as the goods sit in inventory waiting to be sold, both their selling price and replacement cost may rise. Thus three factors, the turnover rate, the rate of change in replacement cost, and the ordering of the outflow from inventory, become critical in determining both the cost of goods sold and the book value of the remaining inventory.

If replacement costs continually rise, the longer an item remains in inventory (i.e. the lower its turnover rate), the larger the discrepancy will be between its historical production cost and its replacement cost when the item is sold and must be restocked. As Figure 2 shows, such discrepancies can become significant.

In addition to the impact of the turnover rate, the ordering issue is of great importance. For many years, almost all businessmen and accountants tended to conceptualize costs and inventories on a FIFO (first in, first out) basis. That is, the item which had resided in the inventory the longest was identified as the one being sold. Since this item was the oldest, it

Replacement cost of an item carried in inventory at \$100

		Turnover Rate (times per year)					
		.5	1	2	4	6	12
	0	100.00	100.00	100.00	100.00	100.00	100.00
Percent monthly rise in replac- ment cost	.1	102.40	101.20	100.60	100.40	100.20	100.10
	.2	104.90	102.40	101.21	100.80	100.40	100.20
	.5	112.40	106.00	103.04	102.01	101.00	100.50
	1.0	127.00	112.70	106.15	104.06	102.01	101.00
	2.0	161.00	126.80	112.57	108.24	104.04	102.00

$$\text{Replacement Cost} = (\$100) (\text{monthly \% increase})^{12 \text{ mos./turnover rate}}$$

FIGURE 2

was also the one that cost the least to produce (assuming constantly rising prices). Since all the items were the same and all could be sold for the going market price, the use of FIFO would tend to upwardly bias the firm's profit margin because it would incorporate into the calculation the largest possible "inventory profit." (Inventory profits are those gains that accrue to the firm when it holds items whose market value rises while they sit in inventory. See figure 2). Within the framework of the transactional concept of income, such a procedure would be acceptable so long as the inventory profits were deflated to reflect the decline in the value of the monetary unit during the period the item sat waiting to be sold. However, those who view the firm as a "going concern" and those who subscribe to the capital maintenance concept of income argue that since the inventory must be restocked after the item is sold, the item's replacement

cost is a more appropriate measure of the "true cost" to the firm than historical cost. However, since a replacement cost system of measurement would require projected estimates of future production costs, such a system would not meet the requirements of verifiability and objectivity. To get around this, the LIFO (last in, first out) system was developed. This method assumes "that the goods most recently acquired or produced are those most recently sold to customers."²⁷ Thus, LIFO uses most recent historical cost rather than estimated replacement cost as the basis for computing the cost of goods sold. But the objective is the same: a closer match of costs and selling prices. With a closer match, reported profits would tend to be lower than with a FIFO system. However, this downward bias in the profit margin would only continue to exist so long as the level of inventories remains stable or increases. As soon as the firm begins to sell off its accumulated stocks, the older and cheaper items would begin to show up in the calculation of the cost of goods sold. Furthermore, LIFO not only reduces the reported profits, it also biases downward the book value of the inventories. At a given point in time, all the items in the homogenous inventory may have the same replacement cost and selling price. But since LIFO identifies the most recently produced items as the ones being sold, the remaining inventory would consist of the older items and thus the book value of the unsold inventory would be lower. Perhaps an illustration of this would be helpful.

Company ABC starts the year with no inventories, no retained earnings, \$200 in cash and a corresponding amount in owners' equity. During the year it produces twelve widgets; the first four cost \$10 each to produce, the second four \$15, and the last four \$18. Now suppose it sells

six of these widgets for \$20 apiece during the period. The tax rate is 50% and all earnings are retained. Also, suppose the inventory will not be replenished until the following year and there are no other expenses.

Comparison of FIFO and LIFO Statements

	<u>Under FIFO</u>	<u>Under LIFO</u>
<u>Income Statement</u>		
Sales	120	120
Cost of Goods Sold	70	102
GROSS MARGIN	<u>50</u>	<u>18</u>
Tax expense	25	9
NET INCOME	<u>25</u>	<u>9</u>
 <u>Balance Sheet</u> <u>(at end of year)</u>		
Cash	123	139
Inventories	<u>102</u>	<u>70</u>
TOTAL ASSETS	225	209
Owner's Equity	200	200
Retained Earnings	<u>25</u>	<u>9</u>
TOTAL EQUITIES	225	209

FIGURE 3

Thus the distortions are evident. In both cases, the inventory is physically the same quantity but it looks dramatically different on paper. Because of the tax deferability of the LIFO method, it provides greater liquidity (more cash), at least in the short run. And of course, the difference in reported net income is significant. In summary then, rising

prices can greatly distort the reported profit margin and asset composition of the firm.

Fixed Assets and Depreciation

Another area where changing price levels have created serious distortions is in the valuation of non-monetary fixed assets and the computation of the depreciation charge. Fixed assets are those economic resources whose expected useful life exceeds one year and which contribute directly or indirectly to the production of goods or services. Usually this includes such things as plant and equipment, office buildings, furniture, vehicles, natural resources, and less tangible things like patents and goodwill. Because these assets usually contribute to the earnings generation process for many accounting periods, their cost could not be expensed in just one period without violating the accrual concept. Thus, the assets are amortized, or depreciated, at some specified rate over their expected useful economic lives. The problems result because as price levels rise, the replacement cost (and presumably the liquidation value) of the assets are also likely to increase.

Thus it is important to understand what depreciation is supposed to represent and how its computation and interpretation is distorted by inflation. The concept of depreciation has a wide variety of definitions and connotations. From the viewpoint of the transactional concept of income, it represents an attempt to match with the period's revenues those expenses that were incurred by the use of the fixed assets in the production process. Under conventional accounting, some portion of the assets' total value (as measured by historical cost) is assumed to have been consumed by their use,

and the depreciation charge is supposed to represent this erosion. To an economist, however, depreciation often has a slightly different meaning. He thinks of an asset as always having some market value which will change as a result of changes in the supply and/or demand conditions for that asset. These changes may result from the passage of time, the use of the asset, or external market factors such as a shift in the demand curve. Therefore, an economist believes that depreciation should be measured by the change in the asset's market value. (Under this definition, depreciation could actually increase reported net income since an item could conceivably have a higher market value at the end of the period than it had at the beginning. Under current accounting practices, such a situation would only be recognized if the asset were actually sold. If it were sold, the difference between its liquidation value and its new net book value would be treated as an extraordinary item.) To a financial analyst, depreciation represents the return of (as opposed to the return on) an investment. This amortization is viewed as a non-cash-flow expense which symbolizes the reimbursement of the firm over time of its investment in the asset. Any increase in excess of historical cost would be considered a return on the investment hence not an expense. Thus for this purpose the use of historical cost is appropriate for determining the period's portion of the total reimbursement. Finally, the subscribers to the capital maintenance concept of income think of the allowance for accumulated depreciation as a tax-sheltered reserve to be used by the firm to replenish its stock of fixed assets.

No matter which concept of depreciation is followed, however, conventional accounting practice is usually inadequate and/or inaccurate during

periods of rising prices. Current accounting practice simply allocates some fraction of the asset's historical cost to each year of its determined useful life. The fraction is computed according to one of many possible pre-determined schedules. The firm's choice of a depreciation method is usually predicated on what it wants to show on the financial statement rather than on what it thinks is the most accurate reflection of reality. Thus, for tax purposes, a firm is likely to use the method which most effectively reduces or defers its tax liability. For public reporting purposes, on the other hand, the firm may use a low depreciation figure so as to boost earnings. Also, depreciation is based on a fraction of historical cost. With changing values in the monetary unit, thus as time passes the charge will even lose its meaning as a fraction of invested capital. Thus, conventional accounting practices have stripped depreciation of any real meaning. However, one can still attempt to measure the distortions that have resulted from such practices.

Suppose, for an example, one believes that the accumulated depreciation should represent a replacement reserve. How adequately do current practices and tax laws allow a firm to set aside such a reserve. (In reality, of course, no actual reserve, or separate bank account, is being set up. It is simply the concept that capital must be replaced that is important). Suppose Company ABC has one machine which it bought at time 0 for \$1000. Furthermore, let's assume that with no changes in quality or technology, the replacement cost of the machine rose at exactly the same rate as the general price level (i.e. its relative price level change was 1.0). As figure 4 illustrates, the use of traditional depreciation could seriously impair the firm's ability to build an adequate replacement reserve.

Ratio of Accumulated Depreciation to Replacement Cost

		Asset's Economic Life (years)				
		1	2	5	10	20
Percent Annual Increase in Replacement Cost	0	1.00	1.00	1.00	1.00	1.00
	2	.98	.96	.90	.82	.67
	4	.96	.92	.82	.68	.45
	6	.94	.89	.74	.55	.31
	8	.93	.85	.68	.46	.21
	10	.91	.82	.62	.38	.15
	20	.83	.69	.40	.16	.03

FIGURE 4

Of course, the situation is not quite this bad. The funds in this paper reserve can hypothetically be re-invested until they are needed for replacement purposes. If these funds could be invested to yield an after-tax return that equals the rate of inflation, then the inadequacy can be reduced somewhat, though it would still be considerable.

Replacement Reserve (Straight-line method and Re-investment)

		Asset's Economic Life (Years)			
		1	5	10	20
Annual Percent Change in Replacement Cost	0	1.00	1.00	1.00	1.00
	2	.98	.95	.90	.82
	4	.96	.89	.81	.73
	10	.91	.76	.61	.42
	20	.83	.60	.42	.24

FIGURE 5

The use of accelerated depreciation methods can reduce the problem still further but not eliminate it.

Replacement Reserve (Sum-of-years-digits method and Re-investment)

		Asset's Economic Life (Years)			
		1	5	10	20
Annual percent change in replacement cost	0	1.00	1.00	1.00	1.00
	2	.98	.96	.92	.85
	4	.96	.91	.86	.78
	10	.91	.80	.69	.54
	20	.83	.64	.53	.36

FIGURE 6

Thus, even if the market value of the asset is converging on zero at roughly the reported rate of depreciation, the impairment and distortions of conventional accounting should still be of some concern from a capital maintenance point of view. But suppose we take an economist's perspective and compute depreciation as the change in market value. If there was no inflation, this approach might be appropriate, provided there are means of deriving accurate and verifiable market prices for used assets. But with inflation, such a technique would still have shortcomings. Suppose for example, the firm had an asset which it bought for \$1000. If the asset dropped in market value at an annual rate of s , the the reported depreciation for period t would be:

$$D = (1000)((1-s)^{t-1} - (1-s)^t)$$

However, this figure would be a misrepresentation of the true change in value because of the changing value of the monetary unit. Adjusting for this change we get:

$$D = (1000) (((1-s)^{t-1}) - ((1-s)^t / (1+g)))$$

If g (the rise in the general price level) should be of any real magnitude, then the distortion could be significant.

In summary then, it is reasonable to say that current depreciation practices, because of their foundation in historical cost, are consistent with the principles of objectivity and conservatism and concept of matching, but for the same reasons they lose their usefulness in times of inflation.

Intimately related to the entire issue of deriving an appropriate depreciation charge is the problem of how to value the fixed assets listed on the balance sheet. Conventional accounting, as previously explained, relies almost exclusively on historical cost as a measure of value. Because this figure is generally verifiable and impartial, the information this practice yields has some degree of usefulness. However, because of both general and specific price level changes, neither the gross nor net book value figure is usually an accurate indicator of either liquidation value or replacement cost. From the transactional point of view, there is nothing wrong with this per se because the concern is with the impact of the asset's use on its future production potential, not on the realizable market value. Also, if the firm is viewed as a going concern, the liquidation value of the individual assets is not necessarily relevant. However, if one subscribes to the capital maintenance viewpoint, replacement costs are of critical importance. (The use of market value

in decision making will be discussed in the next chapter.)

Extraordinary Items

The last major area where inflation has had an impact is the treatment of extraordinary items. As was mentioned earlier, most of these items are non-recurring in nature and usually result from a capital gain or loss. Under conventional accounting, when the asset is sold, the difference between the price for which it was sold and its net book value is considered to be a capital gain or loss. For tax purposes, the capital gains taxes would apply. But on the income statement, the entire gain or loss would be charged to the net income for the year in which the disposal of the asset was done.

There are two problems with the current approach. First, as was illustrated previously, many of the capital gains are not the result of skillful investing or real economic windfalls but rather occur merely because of the decline in the value of the monetary unit. As replacement costs rise because of inflation, so will liquidation values. The current treatment makes no attempt to distinguish between the real and non-real income. The second problem is the issue of when to realize the gain or loss and how to allocate its impact over the period in which it accrued. Current practice only recognizes the gain or loss once the asset has actually been sold. The reason for this is the desire to retain an objective and conservative measurement of income. The use of paper gains or losses would require the use of unverifiable data and assumptions. Current practice also allocates the entire gain or loss to the period when the sale occurred. However, in many cases the gain or loss was accruing for many

time periods, and thus to be consistent with the accrual principle, accounting should theoretically allocate the impact of the charge over all the periods. Such a change would lessen the flexibility of the firm to "engineer" the bottom line by expediently using extraordinary items to obscure the true situation.

Summary

In summary, then, inflation can create serious problems in measuring income and valuating assets. On the one hand, with monetary items, current accounting practice neglects to recognize the economic losses that result from maintaining a positive net monetary position. For inventories, however, current procedures (particularly the use of FIFO) overcompensate for the holding gains and thus create misleading inventory profits. The taxes on these illusory profits can then hamper the firm's ability to replenish inventory. Finally, for fixed assets, traditional accounting procedures are inadequate for both calculating an appropriate depreciation charge and determining a useful valuation of the firm's assets. Depreciation charges tend to be too low to provide enough reserves for capital maintenance and the valuation of fixed assets tends to underestimate market value. Indeed, the problems can seem enormous.

III. EXAMINATION OF THE PROBLEMS CAUSED BY THE DISTORTIONS

Objectives and Scope

Now that the distortions wrought by price level changes have been presented, the next task is to examine how these measurement problems have impacted the decision making process. This requires an understanding of what types of business decisions are made, what kind of accounting data is needed to make the decisions, and how the data is interpreted by the decision makers. Obviously, a detailed look at all of these issues would be beyond the scope of this study. However, it is crucial that the information generated by financial accounting be viewed with a broader perspective.

As was mentioned in the introduction of this paper, there are many different types of business problems and a wide variety of individuals who incorporate accounting information into their decision making process. Among the major classifications of business problems are: investment decisions, judgement regarding credit worthiness, internal planning and control decisions, and the formulation of public policies. However, despite the wide variety of decision makers, they all rely heavily (though usually not exclusively) on publicly reported financial accounts for measures of profitability, efficiency, and solvency. More specifically, as the AICPA Study Group on the Objectives of Financial Statements concluded,²⁸ financial reports should provide information:

- for predicting, comparing, and evaluating enterprise earning power;
- which is useful to investors and creditors for predicting, comparing and evaluating potential cash flows to them in terms of amount,

- timing, and related uncertainty;
- for judging management's ability to utilize enterprise resources effectively.

This chapter then, will concentrate on examining how the inflation-related distortions have affected the fulfillment of these objectives.

Measures of Profitability

In this day and age, probably the most important item of concern to a firm's managers, stockholders, creditors, and competitors is its profitability. A manager is often evaluated on the basis of his unit's profits and earnings growth. Owners worry about the impact of the firm's earning power on its stock price and the availability of dividends. Creditors rely on the firm's earning power to meet interest payments and retire long-term debt. Competitors use the firm's net income figures to assess their own relative performance and as input to their strategic planning process. And of course, government officials and economists watch corporate profit data closely for use in making monetary and fiscal policy decisions. Also, profitability plays an important role in regulatory proceedings and the enforcement of antitrust policies. Yet, despite the critical significance of the profit figure, it is painfully evident that its validity can be substantially impaired by imperfections in the measurement process.

Profitability can be calculated in many different ways and each method yields a measure with a particular connotation and interpretation. The simplest and crudest quantification is the absolute dollar figure,

i.e. the number on "the bottom line". (This number is also used in a number of the ratios to be examined later.) Thus, the process by which it is determined is of the utmost importance. However, as has been seen in the preceding chapter, this process has many ambiguities and distortions. The most obvious of these is the inventory valuation method used. The impact on the profit figure that results from the use of LIFO rather than FIFO will vary depending on the behavior of input costs and the inventory's turnover rate. Thus, it is important for the financial report user to understand these characteristics of the firm being analyzed. Otherwise, it would be difficult to determine with any reasonable degree of confidence, the extent to which inventory profits are contributing to reported profitability. Also, since the use of LIFO can defer a firm's tax liability and thus improve its current liquidity position, the reader would also want to know the extent of this impact. Another one of the imperfections is the exclusion of all unrealized capital gains and losses and the inclusion of such items only in the year of realization. Also, traditional accounting treats all capital gains as income regardless of whether a real increase in economic well-being has occurred. Yet another major bias in current income measurement is its neglect of any explicit quantification of the cost of holding monetary assets and the benefits of leverage during inflationary periods. Finally, the inadequacies of current depreciation practices are responsible for a pervasive upward bias in reported earnings for the reasons stated earlier. Thus it is easy to understand why so many individuals are becoming increasingly skeptical of official profit figures.

In addition to the absolute dollar measure of profitability there are a number of other measures each of which has its own interpretation. Perhaps the most commonly cited measure is earnings per share (EPS). This figure is often thought of as a measure of the return on an investment and is often converted to the well-known price-to-earnings ratio (P/E), which purports to be a measure of the market's evaluation of the "quality" of the firm's current earning power and future growth opportunities. The perils of relying heavily on the EPS and P/E figures have been well-documented elsewhere. The item that is of concern to us here, however, is the closely related dividend to share price ratio. Ultimately, the true value of a given security would be the present value of all the cash flows that would accrue to its owner.

$$M_s = \sum_{t=0}^{\infty} D_t / (1+c)^t = D_0 + \text{Present value of future dividends}$$

M_s : the market price per share

D_t : expected dividend for period t

D_0 : current year's dividend

c : discount rate

An investor should want to compare the D_0/M_s figure with the yield available on other short-term investments. Since these short-term yields will be heavily influenced by the current inflation rate, the firm's managers and stockholders will be strongly concerned with the size and stability of the firm's dividends. As will be seen later, the pressures on liquidity that result from inflation may cause the management to want to retain a greater portion of earnings than they can invest at the current rate of

profitability. On the other hand, the downward pressure exerted on the P/E ratio by rising inflation and interest rates may cause management to take actions which might boost near-term earnings at the expense of long-run profitability. For example, inventories may be run down to get greater inventory profits or capital replacement may be postponed to lower depreciation charges.

In addition to dollar measures, there are a number of other profitability measures (most of them ratios) that have been developed. The most well known of these is the Return on Investment (ROI). The numerator of this ratio is usually the net income figure and thus is subject to all of the problems discussed before. The denominator is usually total assets, valued at historical cost (and sometimes less accumulated depreciation). Thus, the denominator is affected by the myriad of flaws that are imbedded into the current accounting practice of depreciation. In fact, the calculation of an investment's ROI and the abandonment (or liquidation) decision for that investment are both situations where the use of historical cost data could yield a decision that would be different from the one reached if current market value was used. First, for performance evaluation purposes, if ROI was based on net book value it could rise over time merely because of the declining asset base. Such a measure might inaccurately portray the situation. However, the use of gross book value would not necessarily lessen the inaccuracy because it wouldn't take into account the impact of the assets' age on their productivity. For determining profitability, it would be more appropriate to use liquidation value as the value of the asset base since this figure would more accurately re-

flect the market's valuation of the assets' expected potential. Likewise, in analysing the abandonment alternative, the decision-maker should compare the investment's realizable liquidation value with the net present value of the cash flows that would accrue to the firm if it continued the investment. The one which is greater should determine which alternative is better. Another problem is that since the return on an investment could be heavily influenced by the rate of inflation, the ROI figure cannot be studied in isolation. Two items must also be considered.

First, since the inflation rate is often the greatest factor in determining interest rates, and these interest rates represent the return that an investor could get on such investment as bonds and commercial paper, the ROI measure must be evaluated against the inflation rate. Such a comparison would help determine whether a firm is allocating its available resources in a relatively optimal manner. Suppose, for example, a firm's ROI is 10%. If its cost of capital is greater than this, then its financial position is probably not desirable, and the firm should take some action to correct the condition. A common policy is to establish a "hurdle rate" for capital budgeting decisions. This rate, presumably the firm's cost of capital, would be the one which a proposed project's ROI must exceed in order for the project to be undertaken.

The second issue is the problem of determining the degree to which inflation is responsible for increases in reported earnings. For example, if sales and the cost of goods sold both rose by 10% (*ceteris paribus*), then reported earnings would also appear to rise by the same amount, even though the purchasing power of the net income would remain unchanged.

$$\text{for year } t : S_t - C_t = P_t$$

$$\text{for year } t+1 : 1.1(S_t) - 1.1(C_t) = 1.1(S_t - C_t) = 1.1(P_t) = P_{t+1}$$

$$\text{but : } P_t/1 = P_{t+1}/1+g$$

If the capital base remains constant, then the ROI will also appear to rise 10%.

$$P_t/K_t \quad \text{vs.} \quad P_{t+1}/K_{t+1}$$

Thus evaluating ROI in isolation can be misleading.

In many firms, the ROI figure has been supplemented or replaced by a measure called Residual Income (RI).²⁹ Residual Income consists of net earnings before interest (and sometimes before depreciation) less a specified capital charge. Here again, the issue of what is an appropriate value for the asset base is troublesome. Also, there exists the difficulty of determining an appropriate inflation-adjusted cost of capital figure.

Yet another commonly cited measure of profitability is the gross margin (the ratio of net sales less cost of goods sold to net sales). This measure is widely monitored by security analysts and economists as an indicator of pricing flexibility. Pricing flexibility is the ability of the firm to pass on higher input costs to its consumers in the form of higher prices. There are many possible degrees of pricing flexibility ranging from absolutely no ability to pass on higher costs to the capability of passing on far more than the amount of higher costs. A numerical example might be helpful in illustrating this, and also showing the relationship of the gross margin measure with the other measures that have been mentioned.

Comparison of Profitability Measures

time period	Sales (# of units)	Asset Base (\$)	Cost of Goods Sold (\$)	Sales (\$)	Gross Margin (\$)	ROI (%)	Gross Margin (%)
1	100	1000	800	1000	200	20	20.0
2a	100	1000	1000	1000	0	0	0.0
2b	100	1000	1000	1100	100	10	9.1
2c	100	1000	1000	1200	200	20	16.6
2d	100	1000	1000	1220	220	22	18.3
2e	100	1000	1000	1250	250	25	23.0
2f	100	1000	1000	1300	300	30	23.0

FIGURE 7

The chart shows six possible second period results and how these six consequences would compare to the first period's figures. Situation 2a is the least desirable because it shows that the firm was unable to pass on any portion of the increase cost of goods sold. Thus, both the gross margin and ROI measures went to zero. Each successive possibility shows improvement. In case 2f, the firm is not only able to pass on the all of its higher costs, it is even able to increase its sale prices at a faster rate. As a result all the measures show improvement. Remember that the same quantity of items were sold and the cost of goods was identical for all the cases. What is being examined here is the firm's ability to raise prices to reflect higher costs. The concept to recognize here is that rising prices can change the relationship between the various profitability measures and thus it is possible for one measure to show improved performance while another shows deteriorating results.

If there is a lesson to be learned in all this, it is that profitability is not an easy thing to measure accurately and changing price

levels can seriously hamper the process.

Measures of Efficiency.

The next set of measures to examine are those whose objective is to provide quantifications of efficiency. Efficiency is the degree of optimality of the employment of economic resources in the production of goods and services. Thus, it is often expressed as a ratio of output to input. For example, ROI, in addition to being a measure of earning power, is also interpreted as a measure of management's ability to efficiently employ capital. By increasing profit margins and/or by reducing the amount of capital being used, a firm can improve its ROI. However, as was just shown, both components of this ratio have potentially serious problems. There are a large number of other efficiency measures that have been developed and obviously not all of them can be studied here. However, it might be interesting to look at the impact of changing prices on some of the more widely-used ones.

1. Collection period of accounts receivable:

$$\frac{\text{Yearend Accounts Receivable}}{\text{Annual Sales}} \times 360 \text{ days}$$

Suppose at any given point in time, accounts receivable tend to equal some fixed percentage of the sales of the previous quarter. Since yearend receivables will be based on the most recent (and highest priced) sales, this ratio will tend to be biased upwards if prices are continually rising. Using the average receivables balance (if it is available) will help alleviate many of these problems.

2. Inventory turnover:

$$\frac{\text{Annual Sales}}{\text{Yearend Inventory}}$$

The problems here result not only from using yearend figure but also from the strong impact of which inventory ordering method is being used. If actual physical inventories remain constant (i.e. number of units produced equal number of units sold), the use of FIFO will continually push upwards the book value of the remaining inventories. Thus the ratio will remain fairly undistorted so long as sales and production costs are rising at the same rate. However, if LIFO is used, the reported value of the inventory will remain constant but the ratio will continually increase (assuming that sales, in dollars, are rising) and thus the turnover rate will appear to be improving. In fact, even if sales begin to fall off gradually, and inventories begin to accumulate, there will be a time lag before the ratio starts to reflect the changed conditions. This is similar to what happened in the Summer and Fall of 1974 in the national economic indicator. As more firms switched to LIFO, the figures they submitted to the government distorted the indicator and as a result, many businessmen, government officials, and economists were given an inaccurate picture of the economy.

3. Labor Productivity

$$\frac{\text{Sales plus change in inventory}}{\text{Direct labor hours}} \text{ vs. } \frac{\text{Sales plus change in inventory}}{\text{Direct labor dollars}}$$

The left ratio could improve while simultaneously the right ratio is deteriorating. Also, output measured in dollars is likely to appear more favorable during inflationary periods than output measured in physical units.

Measures of Solvency and Liquidity

The final class of measures that will be examined are those that attempt to provide some information regarding the firm's ability to meet short-term financial obligations, make interest payments, pay dividends, and retire long-term debt.

The current ratio (current assets/current liabilities) and the acid (or quick) ratio (quick assets/current liabilities) both attempt to compare a firm's monetary or near-monetary assets with the debt that must be retired or refinanced during the next period. The acid ratio is the more conservative of the two measures in that its numerator contains only those assets that exist as cash or can easily and quickly be converted into cash. The net working capital ratio (the ratio of current assets less current liabilities to total assets) provides a measure of a firm's operating liquidity. ~~Times interest earned (Net income before interest/ interest payments) is a measure of the "coverage".~~ It attempts to tell creditors how confident they can be that the firm has enough earning power to generate the cash needed to make the interest payments. Finally, the debt to equity ratio (total liabilities/total equities) is a measure of the firm's leverage. Presumably, the greater the leverage is, the higher the financial risk is.

Perhaps a pro-forma simulation of a firm's financial reports would be helpful in illustrating the impact of rising prices on liquidity and solvency.

As figure 7 illustrates, rising price levels can have a dramatic impact on a firm's liquidity and cash reserves. Even with no real growth in output, the firm must increase its resource commitments in receivables,

FIGURE 8: Simulation of ABC Corporation

Assumptions

Change in sales (in \$) = change in cost of goods sold (in \$)
Production costs are rising at 10% annually
FIFO is being used
Accounts Receivable = 15% of annual sales
Accounts payable = 10% of cost of goods sold
Inventories = 15% of cost of goods sold
Capital replacement = 110% of previous period's depreciation (but capacity is kept stable)
No other expenses other than cost of goods sold
Tax rate = 50%
Dividends = approximately 80% of after tax profits
Interest rate is 10% of all debt except accounts payable

Income Statements

	<u>1975</u>	<u>1976</u>
Sales	20000	21600
All expenses except dep'n & taxes	<u>16000</u>	<u>17600</u>
Gross Profit margin	4000	4000
Depreciation	<u>2000</u>	<u>2036</u>
Pretax Profit	2000	1964
Taxes	<u>1000</u>	<u>982</u>
Net Income	1000	982
Dividends	<u>800</u>	<u>782</u>
Addition to R/E	200	200

(Continued on next page)

FIGURE 8: Simulation of ABC Corporation (Continued)

<u>Balance Sheets (as of December 31)</u>			
	<u>1974</u>	<u>1975</u>	<u>1976</u>
Cash	1000	710	206
A/R	2782	3000	3240
Inventory	<u>2183</u>	<u>2400</u>	<u>2640</u>
Current Assets	5965	6110	6086
Plant & Equipment	12000	14200	16620
less acc. dep'n	(2000)	(4000)	(6036)
Total Assets	<u>15965</u>	<u>16310</u>	<u>16670</u>
Accounts Payable	1455	1600	1760
Short-term debt	<u>1200</u>	<u>1200</u>	<u>1200</u>
Current Liabilities	2655	2800	2960
Long-term debt	<u>3110</u>	<u>3110</u>	<u>3110</u>
Total liabilities	<u>5765</u>	<u>5910</u>	<u>6070</u>
Stock @ par value	10000	10000	10000
Retained earnings	<u>200</u>	<u>400</u>	<u>600</u>
Total owner equity	10200	10400	10600
Total Equities	<u>15965</u>	<u>16310</u>	<u>16670</u>
Current ratio	2.25	2.18	2.06
Acid ratio	1.42	1.32	1.16
Net Working Capital Ratio	.21	.20	.19
Debt/Equity	.36	.36	.36

inventories, and capital replacement. Some of these additional commitments can be financed by the firm's suppliers in the form of higher accounts payable. However, the bulk have been financed with retained earnings and existing cash resources. Thus the acid, current, and net working capital ratios show deterioration. Although in this example, the debt/equity ratio remains fairly stable, the drain on the firm's cash reserves would probably make it inevitable that the firm would have to eventually seek more debt. Otherwise its working capital position would become insufficient. With greater debt would come greater interest payments. If gross margins are not improved, profits after tax will decline and thus the coverage ratio (times interest earned) will also soon fall.

Thus the strains on the firm's liquidity are considerable and would be further aggravated by any plans for real growth. Also, since these strains are impacting not just this firm but also its suppliers and customers, the receivables may become harder to collect and additional trade credit may become increasingly difficult to obtain. The only bright side to all this is that a cash starved firm will suffer lower holding losses on its monetary accounts because as its monetary assets fall relative to its monetary liabilities, the net monetary position will become increasingly negative.

In addition to its affect on short-term liquidity, inflation can have a devastating effect on the long-term solvency of the firm. The reason for this is the inability of current depreciation practices to set aside ample reserves for capital replacement. Thus highly capital inten-

sive industries (utilities, transportation, chemicals, paper, etc.) are currently being seriously impacted. Since they are often forced to replace and upgrade capacity with retained earnings and/or increased long-term debt, they risk either alienating their stockholders because of low dividend payout rates, or they risk straining the willingness of their banks to extend greater credit. So long as their profitability remains high, such pressures are not likely to become too severe. But if a price squeeze should occur (as often happens in capacity-sensitive industries), some of the firms could find themselves in serious financial shape. Indeed, inflation can have a dramatic impact on solvency and liquidity.

Policy and Strategy Implications

This liquidity impact has tremendous implications for a firm's pricing, credit, and inventory policies. If market conditions permit, the firm would probably begin to price its products on the basis of replacement cost rather than on FIFO historical costs. Also, to preserve cash the firm may try to cut back on the amount of credit it extends to its customers. This might possibly hurt its market share. Also, the management may start to pare down inventories. However, inventory control is a delicate art involving many difficult trade-off decisions. Such an arbitrary reduction could hurt the firm's relations with its customers because it would probably result in a greater number of stock-outs and longer delivery times.

Inflation can have a particularly troublesome effect on a firm's dividend policy. In addition to the desire of management to withhold earnings to improve liquidity, there arises the issue of management's

concern with meeting a target payout rate. Usually this payout rate is stated as a percentage of the net income for the period. But should this ratio use the net income figure as conventionally calculated or net income adjusted for the impact of inflation? Clearly, the use of the adjusted figure would be superior since it more accurately measures the increase in real wealth that has accrued to the firm's stockholders. However, as Shank and Rauwerdink have demonstrated, neither macro- nor micro-economic data reflect the widely-held belief that corporate managers are already implicitly adjusting their dividend rates to compensate for general price level changes.³⁰

Comparability and Projectability

Inflation not only impacts the computation of financial measures, it can also impair their accurate utilization. One of the most critical examples of this is the present difficulty of tracking a firm's performance and condition over time. An accurate comparison of financial reports for different years requires that one have enough information to be able to restate the figures in terms of a common monetary unit. Also, if the market value of the firm's assets deviate from their book value, this information would also be needed for some types of analyses. Furthermore, if a firm's capital intensity has changed, or the firm's relationship with its forward or backward markets has changed, the impact of inflation may also change. Thus the reader must be aware of such trends and understand how they could distort the comparative analysis. Similar problems exist for those who wish to project earnings, cash flows, or any of the various ratios. Since such projections would be heavily affected

by future inflation rate assumptions, the analyst would need some reliable forecasts. As well know, they can be hard to find.

Summary

In summary, it can be said that inflation has seriously impaired the validity and utility of conventional financial reports. It has not only distorted the process by which the financial data is computed, but has also disrupted and weakened the process of interpreting the figures and applying these interpretations to business problems.

IV. EVALUATION OF PROPOSED CHANGES

Objectives and Scope

If there is one fundamental observation that can be made from the preceeding analysis, it is that conventional accounting is inadequate for dealing with the measurement problems of an inflationary era. The values, principles and methodology which presently underly the financial accounting discipline are understandable and have served many useful purposes. However, all too often, they have been construed to be ends in themselves, rather than the means to the true objective of accounting, namely, the gathering and presentation of useful financial information.

Hopefully, the analysis presented in this paper has shown how traditional accounting methods, when confronted with changing price levels, have created distortions and have omitted much information which would be helpful in making business decisions and judgements. Now the task is to see if any formal changes are warranted and feasible. Much time and effort has been spent by many dedicated members of the accounting profession in researching and developing new ways of measuring the impact of inflation on financial data and presenting this impact in financial reports. The two proposed reforms which have resulted from this effort are: 1) price-level accounting; and 2) current value accounting. The objective of this final chapter is to describe and evaluate these two proposals and perhaps reach some conclusions as the desirability of the adoption.

Establishment of Normative Standard

Before one can even begin to evaluate a change, however, a standard or set of normative criteria must be established. This standard should consist of those characteristics and attributes which are deemed to be desirable. Obviously, no accounting system ever devised will be considered perfect in all respects. Rather each will have its own strengths and weaknesses. It is the responsibility of the evaluator to determine the nature and relative importance of these strengths and weaknesses and from his analysis decide which system seems most appropriate. Such an analysis will, of course, be very subjective in nature. But important issues are rarely clear-cut, and man's attempts to wrestle with them are what bring about progress.

What then, are the desirable characteristics for which one ought to search when examining a proposed change?³¹

- 1) The new information should be useful. This seems sensible enough since the ultimate objective of financial reports is to provide knowledge which is of some positive value to its users. Also, the change should provide information which, heretofore, was unavailable. Furthermore, to be of value, the information must be understandable. Usefulness is a very ambiguous goal but nevertheless it is an ideal for which one must continually strive.
- 2) The benefits of having the information should be greater than the costs of providing it. The process of gathering, processing and disseminating financial information is a costly one, and an adopted change could greatly increase this cost. Such a change may require the development of new systems and procedures. Also, the process of teaching the financial

report user community the meaning of the new information could be difficult and expensive. Thus, a cost/benefit approach, though difficult to apply is certainly appropriate if possible.

3) Objectivity and verifiability are critically important. If financial reports are to remain credible, they must be kept as free as possible of intentional and/or systematic bias. Also, the sources of all quantitative data must be traceable.

4) The behavioral problems of implementing a reform must be recognized and dealt with. It is only natural that individuals prefer to do things in the manner in which they are most accustomed. Thus, a certain amount of inertia is usually prevalent. Also, some individuals would have difficulty learning the new material. Even for those who are able to understand the change, an adjustment and acclimation period would be needed.

5) The impact of such a change on other areas must be recognized and taken into consideration. New measurement techniques, and the attitudes that may result from them, could become a catalyst for change elsewhere. For example, by conceptualizing income in a new way, tax or regulatory policies may warrant reform. Also, labor negotiations may be affected by new measures of efficiency and productivity.

This then, will be the standard against which the two proposals will be evaluated. The task is no an easy one, but it is one that must be done.

Price-Level Accounting

The first proposed change which will be examined is called price-level accounting and its product, price-level adjusted (PLA) financial statements. The primary objective of this proposal is to state all the

accounts on the firm's income statement and balance sheet in terms of a common monetary unit. As was explained earlier, assets and liabilities flow into and out of the firm at different points in time and thus on conventional statements they are being valued in dollars of different purchasing power. PLA statements hope to alleviate this problem through the use of only one measuring stick, the value of a dollar as of some specified date.

The first step, then, would be to choose the date of the common monetary unit. It is generally agreed that the current balance sheet date is probably the most useful because the reader has a clearer image of the purchasing power of a current dollar than of a historical one. However, any date could be used as long as it is used consistently.

The next step is the choice of a general price-level index. As was explained in the introduction of this paper, a price-level index is a measure of the change in the general level of prices, or the change in the purchasing power of the "average" dollar. Many such indices exist, and all have serious methodological flaws. However, the one usually considered to be the best available overall measure of inflation is the Gross National Product Implicit Price Deflator. There are those who argue that this index is too broad a measure, and thus is irrelevant for most firms. They argue that a set of specific indices should be established and a firm would use the one which most closely approximates its market basket. There is certainly some validity to this argument, and the use of specific price indices would yield some valuable information. However, the subscribers to this approach are confusing price-level ad-

justments with replacement cost adjustments. The two ideas are different, and for purposes of clarity, they should be kept distinct.

Once the common monetary unit and the price-level index have been chosen, the adjustments can be made.³² The income statement accounts will be examined first.

Sales would be restated by a factor such that they all would be expressed in year-end dollars. For example, if the sales were made evenly throughout the year, they would be treated as if they were all made at the average dollar of the year (i.e. the price index's average for the year). Thus, the adjustment factor would be:

$$S_c \times \frac{I_t}{I_a} = S_t$$

S_c : sales as conventionally measured

I_t : price index as of the current balance sheet date

I_a : price index average for the year

S_t : sales as restated

For the restatement of past income statements, the adjustment factor would be the ratio of the price index as of the two balance sheet dates. In other words:

$$S_{t-1}^{t-1} \times \frac{I_t}{I_{t-1}} = S_t^{t-1}$$

S_z^y : price-level adjusted sales for year ending at y as restated at the end of year z.

For the cost of goods sold, the adjustment would be similar to that for sales. The cost of an item sold would be adjusted to reflect the change

in the general price-level from the point when it entered inventory to the present. If FIFO was used, and all the purchasing and production was done evenly throughout the year, the calculation would be as follows:

$$\begin{array}{r} \text{Beginning Inventory} \times (I_t / I_{t-1}) \\ + \text{Additions to inv'y} \times (I_t / I_a) \\ \hline \text{Goods available for sale} \\ - \text{Ending inventory} \times (I_t / I_a) \\ \hline \text{Cost of Goods Sold (restated)} \end{array}$$

The use of LIFO would complicate things but the concept would remain the same since LIFO still uses historical cost as a measuring procedure.

The calculation of the depreciation charge is another important item. For each depreciable asset, the historical cost and purchase date must be determined. The depreciation charge would be computed in the conventional manner and then adjusted to reflect the change in the index from the time the asset was purchased to the current date.

$$D_{hc} \times (I_t / I_p) = D_y \quad (\text{done for each asset and then aggregated})$$

D_{hc} : depreciation charge as conventionally computed

I_p : price index when asset was acquired.

The computation of accumulated depreciation and net book value will be discussed later.

All other expenses would be treated in much the same manner as cost of goods sold. Thus the dates at which all the expenses were incurred must be recorded. Dividends paid at year-end would be measured in year-end dollars thus no adjustment would be necessary.

The most important new account would be the "gain or loss on monetary items." The average net monetary position (monetary assets less monetary liabilities) would be computed. Then the gain or loss would be computed as:

$$(-1)(NMP)((I_t - I_{t-1})/I_{t-1}) = \text{Holding gain}$$

NMP: net monetary position

This gain or loss would then become a charge to or against the net income for the period.

On the balance sheet, many of the restatement procedures are quite similar in nature. For the cash, accounts receivable, and other monetary items on the current year's balance sheet, no adjustment would be needed because they are, by definition, already valued in the common monetary unit. The restatement of past periods' balance sheets, however, would require a revaluation based on the change in the price level.

$$M_{t-1}^{t-1} \times (I_t / I_{t-1}) = N_t^{t-1}$$

M_{t2}^{t1} : the monetary assets that are stated on the balance sheet for the year ending at t1 as restated for the balance sheet at t2

The same procedure would be applied to the monetary liabilities, both current and longterm.

As mentioned previously, for inventories each item's value would be adjusted by the ratio of the price-level index as of the current balance sheet date to the date when the item was put into inventory. As a shortcut, if the FIFO method is used, the rate of purchasing and production have been fairly constant, and inventory levels are stable, then one can assume that the inventory was acquired at the average price level for the year. The restatement of past balance sheet figures would follow the same procedure as before.

The situation for plant and equipment (and other depreciable assets) is somewhat more complicated. Historical cost is still the basis for measuring the assets' "value". However, some adjustments are made. The gross book value of each asset is restated to reflect general price level changes.

$$GBV_{hc} \times (I_t / I_p) = GBV_t$$

GBV_{hc} : gross book value at historical cost

GBV_t : gross book value as restated on the balance sheet as of time t

The accumulated depreciation would also be restated.

$$\frac{AD_{hc}}{GBV_{hc}} \times GBV_t = AD_t$$

AD_{hc} : accumulated depreciation as conventionally calculated

AD_t : accumulated depreciation as restated for the balance sheet as of time t

Thus: $\frac{AD_{hc}}{GBV_{hc}} = \frac{AD_t}{GBV_t} = \%$ of gross book value that has been depreciated

And of course: $NBV_t = GBV_t - AD_t$

NBV_t = net book value at time t

For capital stock and retained earnings, the restatements would be similar, that is, based on the ratio of the current price level to the one when the additions flowed in.

A new account called "accumulated gain or loss on net monetary items" would be added to the owners' equity portion of the balance sheet. This account would represent the multi-period aggregation of the annual holding gains or losses. The accumulated total would be subtracted from the sum of capital stock plus retained earnings to determine net owners' equity.

One major issue in price-level accounting which is still unresolved is the treatment of the income of foreign subsidiaries. The rate of inflation varies from country to country. Also, under the current system of floating currency exchange rates, the relative rate of inflation (and changes in this relative rate) between two nations, will have an important impact on the exchange rate of their currencies. Thus, the process of translating foreign operating results to the consolidated financial statements of the parent company reflects, at least partially, the relative rates of price-level change. The controversial issue that arises is whether to base the price-level adjustments of foreign operations on the foreign or domestic inflation rates. In other words, should it be: 1) translate then restate; or 2) vice versa. Both procedures could yield meaningful results if properly handled so the question is which is more appropriate. For a variety of reasons (probably including feasibility

and ease of implementation), the current FASB opinion recommends the first alternative.³³

The format of the new corporate reports would probably be conventional historical-cost based statements supplemented by PLA statements. The PLA statements would have their own footnotes to explain all assumptions, policy choices, and other information.

These procedures, then, constitute the basic concept of price-level adjusted statements. The task now is to evaluate this system against the set of criteria iterated at the beginning of this chapter.

What new and previously unavailable information would be provided and would this information be useful? Clearly, PLA statements would provide additional knowledge. They would illustrate the impact of changes in the purchasing power of the dollar on the firm, and would facilitate the comparison of reports for different points in time. Real growth rates of sales, costs, and profits would become more explicit as would the inadequacy of current depreciation practices. Also, by comparing the conventional and adjusted book values of the fixed assets one may get a clearer picture of the age of the assets and perhaps a closer estimate of their market value. (However, PLA accounting makes no direct attempt to determine either appraised liquidation value or replacement cost.) Furthermore, the effective rate of taxation would be shown more precisely. Perhaps even more important would be the explicit recognition of the costs of holding monetary assets and the benefits of having debt during inflationary periods. Finally, all these factors would aid the process of making more accurate interfirm comparisons. Thus it seems evident that new and valuable information would be provided.

But would it be worth the cost? This is a tough and perhaps unanswerable question. PLA statements would require the availability of a reliable and useful price index. Also, it would undoubtedly necessitate some modifications in financial reporting systems. The date of all sales, purchases, and capital equipment acquisitions would have to be recorded. Though impossible to accurately estimate, these requirements would probably not be all that enormous. The real costs would be in learning how to interpret the data and how to apply it to decision-making. Also, the reports would take some getting used to. We have all been using conventional reports for so long that developing new standards and expectations could take some time. Thus, a cost/benefit analysis would have to be very subjective.

Another favorable feature of PLA statements is their objectivity and verifiability. The methodology and sources of data remain traceable and the adjustments cannot be affected ex post by the desires or biases of the firm's management.

Finally, the widespread use of PLA statements could have a significant impact on certain industries and public policies. The fundamental basis for rate setting in regulated industries is a fixed percent return on invested assets as valued by historical costs. Also, tax rates are computed on the basis on money income regardless of any changes in the real economic value of that income. Thus, multiple sets of books might have to be kept to satisfy all the legal requirements. But more importantly, the use of price-level data would hopefully enlighten public policy makers as to the inequity of current laws and policies.

Current-Value Accounting

However, there are many individuals who disapprove of price-level accounting. They recognize that conventional accounting practice is inadequate in reflecting the impact of changing price-levels. However, they feel that the restatement of accounts to a common monetary unit will not suffice. In fact, as John C. Burton, chief accountant of the Securities and Exchange Commission claims, "an accounting system based on the mechanical adjustment of costs by the use of a broad-based general price-level index ... may be affirmatively misleading rather than helpful."³⁴ He goes on to say: "Since the impact of inflation falls differently on various sectors of the economy and various parts of companies, the relationship of historic PuPus (Purchasing Power Units) to current cash outflows is tenuous at best."³⁵

It is for these reasons that an alternative reform, current-value accounting, has been proposed. This is a more radical proposal in that it represents a departure from historical cost as the major basis for valuation. Rather, the objective of current-value accounting would be to present on the balance sheet the current economic worth of the firm's resources and the claims against them and to present in the statement of earnings the changes in real wealth that have occurred during the period.

The methodology of current-value accounting is somewhat less precise perhaps because it is a newer idea and one that has yet to be officially recognized. Basically, it would require the extensive use of appraised liquidation value as the method of measuring the worth of the firm's inventories and fixed assets. (Some systems would use estimated

replacement cost in lieu of liquidation value since replacement cost information is of greater value to the individual concerned about capital maintenance.) Monetary assets and liabilities would be valued at the current dollar value. Capital stock, however, would be stated at par value because use of market value would be misleading and inappropriate. Since all the assets and liabilities would be stated at current market value, they would all be measured in a common monetary unit. However, for intertemporal comparative purposes, adjustments would have to be made to reflect changes in the general price level and their impact on capital maintenance. The proposed procedure to accomplish this would be to establish and include in the owners' equity section, a contra account. This account would be computed each year by multiplying the change in the price-level by the weighted average for the year of beginning stockholders' investment plus retained earnings. The change in this contra account would be charged against the reported income for the period so as to differentiate between real and money gains. Other income statement accounts would also be changed. Cost of goods sold would be measured by either most recent (LIFO) or projected (NIFO) production costs. Depreciation would be computed by the change in the market value of the fixed assets. Most other expenses and revenues, however, would be handled much the same way as they are now.

How does current value accounting stack up against our normative standard? Certainly it too could yield potentially valuable information. Both creditors and owners are usually interested in the realizable liquidation value of the firm's assets. Economists would be more satisfied

with the calculation of the depreciation charge. Also, separate recognition and treatment of the impact of general and specific price changes would enable the reader to distinguish between real and non-real changes in wealth.

However, the costs involved in establishing and maintaining a current value accounting system could be exorbitant. The strain on the appraising profession might be overwhelming and the expense of the massive amount of required appraisals would certainly be very high. Here too, there would probably be considerable costs involved in educating the financial community on the meaning of the new data. Likewise, new standards and expectations would have to be established.

Perhaps the most severe problem of current value accounting, however, would be the potential lack of objectivity and verifiability of the data. Appraising is a very imprecise science and thus the published figures might easily be distorted by subjective judgements and strong biases. Burton, however, contends that "as long as accountants are prepared for some tolerance from imprecision, it appears that a practical system can be achieved."³⁶ In fact, for a firm whose assets have thick and efficient markets (e.g. farm commodity dealers, banks, etc.) the problems would not be too bad. Nevertheless, this writer feels that for the great majority of business enterprises, the pitfalls could be debilitating.

Thus, it would appear that there are many severe questions regarding the desirability of current-value accounting. A good system could

be of enormous value, but current feasibility problems probably render the concept impracticable and its product unreliable.

Implementation Considerations

Regardless of what type of reform is eventually chosen, the manner in which it is implemented will undoubtedly be an important factor in determining the success of the change. There are a number of critical issues that must be recognized here. First, it must be demonstrated to the general public and the users of financial community that a problem really does exist and something must be done. Then, it must be explained that there is no simple solution or formula which will alleviate all the flaws and that the accounting profession cannot solve the problem without the cooperation of all the interested parties. And of course, it must be understood that any proposed change is probably not perfect at its inception, and the rule-making process must be recognized as being evolutionary in nature. Because of all these issues and also because of the time, expense, and uncertainty that surround a major reform, some initial period of time should be set aside for experimentation. This could allow the firms and the profession to get a clearer picture of how costly and feasible the change will be. Perhaps a few firms might volunteer to try the system for a few years before a decision regarding widespread adoption is made. In fact, it might be found that the change might only be necessary for large, publicly-held, non-regulated firms. And of course, some policies will have to be established with regard to how much flexibility the individual firms will have in adapting the new

rules to their operations. In the past, only a handful of firms have voluntarily adopted PLA statements even when they were strongly recommended by the APB. Indeed, the implementation strategy must be carefully thought out.

V. CONCLUDING REMARKS

In concluding this analysis, it might be appropriate to review the major issues and discuss the prospects for future change.

Clearly, it has been shown that many problems exist. This paper has hopefully presented and explained the source and nature of the distortions and the impact they have had on the use of financial statements and the formulation of business and public policies. Furthermore, an explicit intention of this effort has been to demonstrate the urgent need for change.

As of this writing, the rate of inflation is subsiding from historic heights but is expected to remain substantial for years to come. Some forecasters predict an even greater resurgence within the next decade. Thus, inflation seems likely to be an integral part of the business environment, and as such, it will continue to have a strong impact on conventional financial statements. This paper has described two proposed changes, each of which has as its objective the recognition and measurement of the distortions wrought by price-level changes. What are the prospects for these reforms to be accepted in practice? For price-level accounting, the future appears bright. Though not universally desired, supplementary price-level adjusted financial statements seem on the verge of being strongly recommended (if not absolutely required) by the Financial Accounting Standards Board. Current-value accounting, however, still has strong and influential opposition. Nevertheless, its supporters seem to be gaining strength and perhaps within a few decades it too will become widely used.

Despite widespread feelings to the contrary, it is the belief of this writer that the accounting profession recognizes the pressures and needs for reform and is dedicated to constructively responding to social and economic changes. To end on a note of humor: the profession seems willing to be held accountable for the quality of its products.

FOOTNOTES

¹Eldon S. Hendrikson, Accounting Theory, Richard D. Irwin, Inc. (Homewood, Ill., 1970), p. 202.

²Ibid., p. 203.

³Ibid., p. 204.

⁴Ibid., p. 206.

⁵Webster's New World Dictionary, The World Publishing Company, (New York, 1966), p. 749.

⁶Ibid., p. 1480.

⁷Statement of the Accounting Principles Board No. 4, "Basic Concepts and Accounting Principles Underlying Financial Statements of Business Enterprises," October 1970, p. 17 as cited in Solomon Fabricant, "Inflation and Current Accounting Practice: An Economist's View," The Journal of Accountancy, (December 1971), p. 39.

⁸Objectives of Financial Statements for Business Enterprises, Arthur Andersen & Company, 1972 (Subject File AA 2850, Item 1), p. 15.

⁹Ibid., p. 13.

¹⁰for further detail see Ibid., Chapters 2, 3, 5, 6, and Robert Anthony, Management Accounting, Richard D. Irwin, Inc., (Homewood, Ill., 1970), Chapters 2, 3.

¹¹Anthony, op. cit., p. 54.

¹²Hendrikson, op. cit., p. 167.

¹³Anthony, op. cit., p. 62.

¹⁴Hendrikson, op. cit., p. 167.

¹⁵Robert T. Sprouse and Maurice Moonitz, "A Tentative Set of Broad Accounting Principles for Business Enterprises," in Accounting Research Study No. 3, (New York: AICPA, 1962), p. 47 as cited in Hendrikson, op. cit., p. 165.

¹⁶ Anthony, op. cit., p. 29

¹⁷ Hendrikson, op. cit., p. 118.

¹⁸ Ibid., p. 118.

¹⁹ Accounting Principles Board Statement No. 4, p. 12 as cited in Fabricant, op. cit., p. 42.

²⁰ Anthony, op. cit., p. 33.

²¹ for further detail see Hendrikson, op. cit., Chapter 5.

²² Ibid., p. 131.

²³ Ibid., p. 141.

²⁴ Ibid., p. 208.

²⁵ Ibid., p. 206.

²⁶ Ibid., p. 207.

²⁷ The Last-In, First-Out (LIFO) Method for Valuing Inventories, Arthur Andersen & Company, August 1974, p. 1.

²⁸ as cited in Response to Discussion Memorandum of Conceptual Framework for Accounting and Reporting: Consideration of the Report of the Study Group on the Objectives of Financial Statements, Arthur Anderson & Company, September 3, 1974.

²⁹ for further detail on the relative merits of ROI and Residual Income see Robert Anthony, John Dearden, and Richard Vancil, Management Control Systems, Richard D. Irwin, Inc., (Homewood, Ill., 1972), Chapter 7.

³⁰ John K. Shank and William J. Rauwerdrink, Implicit Adjustment for Price-Level Changes: Two Further Tests, Harvard Business School Working Paper, February 19, 1975.

³¹ for further discussion of these criteria see Objectives of Financial Statements for Business Enterprises, op. cit., Chapters 2, 3, 5.

³² for more detail see Reporting the Financial Effects of Price-Level Changes (Accounting Research Study No. 6) (New York: AICPA, 1963).

³³ Financial Reporting in Units of General Purchasing Power, (FASB Exposure Draft) December 31, 1974, p. 25.

³⁴ John C. Burton, "Accounting that Allows for Inflation", Business Week (November 30, 1974), p. 12.

³⁵ Ibid., p. 14.

³⁶ Ibid., p. 12.

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