15 THE VALUATION OF ECONOMIC ACTIVITY: AN INTUITIVE APPROACH

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I think that the disarray of our (accounting) theory can be traced to the way we formulate our research problems . . ..

There is the real danger of being misled by studying simplified cases. . . our only hope is to simplify.

R. R. Sterling, [Introduction, p. 3.]

THE INTERNATIONAL ACCOUNTING PROFESSION has been in a state of turmoil as a result of inflationary pressures throughout the world. Academicians and practitioners have been searching for solutions that would represent real economic activity accurately and without so-called "adverse effects," either on the reporting entities or on national economies. The historical cost accounting model has been found wanting in measuring meaningful economic data for business enterprises. Studies abound in contemporary literature addressing the various issues of inflation accounting, and many proposals of regulatory bodies have been put forth. Unfortunately, few of these converge towards a common solution. (See [Vasarhelyi and Pearson, 1977 and 1978] for a taxonomization of literature and a bibliography of over 550 titles.)

This paper represents an attempt to find a viable solution to some of these problems; it is written with the purpose of providing an essentially new approach to inflation accounting. Although this paper may be viewed as somewhat heretical in nature, we hope that it is in consonance with the spirit of this conference.

Initially, we shall state some axioms which will point out the basic inconsistencies of current accounting thought. By building on these axioms, a simplified model will be developed to explain the economic behavior of a system and the basic parameters for representing such

a system. We will then apply the proposed model to the taxicab example and discuss the key features of this application. The conclusions will summarize the relevant reporting issues within a cost-benefit framework to highlight some possibilities for future research.

DISCUSSION AXIOMS

A Discrete But Unstable Standard Has Been Used (the Currency)

The present accounting model assumes a stable measurement unit in a world in which such a unit does not exist. As strong and stable as the Swiss franc may be, its purchasing power is contingent on relative prices in the countries from which Switzerland imports or to which it exports goods. In terms of a stable measurement unit, this relativity becomes a major problem.

Consider the efforts put forth with regard to other measurement units. Nations confronted with the problem of lack of standards for the measurement of length cooperated to establish the "standard meter" which was installed at the international Pavillion in Sèvres, France. With the advent of spectography, an even better and more precise definition was established for the meter. This standard was later associated with a "time measurement" standard defined in terms of the earth's relative motions (also not an absolute standard) to measure velocities. This relationship, standardized in a linear manner, encountered difficulties with the advent of relativistic quantum theory and relative velocity concepts. Space flights magnified this problem and astronomers resorted to tri-dimensional relative measurements for locational measurements. Despite these efforts and these limitations, a meter is still used for distance and kilometers per hour for velocities.

Accountants have not shown much interest in adopting a national price level as a measurement standard (a multiple reference standard) or to the development of a standard goods aggregate to use as a benchmark for currency valuation. Similarly, accountants have not accepted the concept that traditional standards can be used to measure one set of data and that adjustments must be made to other types of data. ([Financial Accounting Standards Board, 1975], on currency translation, is a typical situation in which a national standard may not be appropriate.) Consequently, the dollar might be used for short-term estimations of costs, annual results might be measured in terms of more stable time-series-resistant measurement units (such as price-indices), and results for multinational companies might be measured in

terms of purchasing power of a pre-set mix of goods in the international market rather than in terms of a designated currency like the dollar.

A Static Model Has Been Used for the Measurement of a Dynamic Phenomenon

Accounting reflects a series of time-related events which are unevenly affected by the passage of time. Goods are affected essentially by obsolescence or wear and tear; currencies are affected by unrelated changes in the macro-economic conditions of competing currencies; and intangibles (such as goodwill) by technological developments and changes in consumer preferences. These various changes are not consistent and may vary nonlinearly through time. Examples of items with fluctuating characteristics include the value of gold, oil drilling equipment, and a patent for a vacuum tube.

The traditional accounting model deals with these issues in a static manner. It enters values as determined by a unique and nearly universal principle (book or carrying value); it treats changes in these values in a very idiosyncratic manner (by changing the value for plant assets according to a predetermined "rule," by ignoring currency value changes, by keeping the carrying value for land constant, and by valuing inventories at the lower of cost or market); it neglects nonlinearities in time changes by excluding relevant issues on the grounds of inherent difficulty in quantification (such as for research and development costs).

A Deterministic Model Represents a Stochastic World

Accountants only recognize the stochasticity of the world through the back door. They have adopted a "materiality" concept to deal with variations from a given estimate and generally have rejected purely stochastic estimations with the exception of some recent statistical techniques used to measure the cost of pension plans and capital leases.

In some areas, such as in the valuation of inventories and real estate, stochastic estimation techniques have been confined to a series of arbitrary rules. The stochastic nature of impending legal liabilities and economic benefits of research and development efforts has served to keep such events out of the body of corporate balance sheets, thus leading to potentially material errors in the presentation of financial position.

It is not surprising that accounting history has shown a propensity for rather deterministic treatment of economic events. The use of statistics has not been widespread in the measurement of economic

phenomena. It is surprising that accountants have not made a more extensive use of statistics in measurement areas where modern statistical techniques are readily adoptable. For example, the field of business has used credit scoring techniques and discriminant analysis for over a decade to determine credit availability based on a profile of expected nonpayees. However, the same techniques have not been accepted widely by accountants in the estimation of periodic doubtful accounts expense.

A Unique Approach Has Been Sought for Resolving the Inflation Accounting Controversy

A general purchase price method, replacement cost accounting, exit value accounting, current cost accounting, and several compromise solutions have been among the many proposed to resolve the inflation accounting controversy. Most of these proposed solutions have been greeted with a conspicuous lack of enthusiasm. The reason for this is obvious: A treatment seemingly reasonable for manufacturing enterprises (which are concerned with the treatment of plant assets, depreciation, and maintenance of capital) would be extremely inappropriate for public utilities (which are concerned primarily with pricing of services and the treatment of long-term debt) or for the petroleum companies (which are concerned with the treatment of resource reserves and the accounting for drilling costs) or for manufacturers of electronic and computer equipment (which are concerned with the treatment of patents and leases). Compromise-type proposals are not geared toward an item-by-item measurement effort but toward the minimization of objections from the various industry sectors. Such an approach is politically sound, but it is not adequate for the development of consistent and scientifically based valuation procedures. Ideally, financial statement items should be valued using a theoretically ideal measurement method, regardless of the impact on the national economy. Such an idealistic goal in a private enterprise economy with a multitude of national goals and well-entrenched vested interests may be difficult to achieve. For example, a recent article in a leading business periodical stated that a primary aim of any inflation accounting method should be the capacity of such a method "not to accelerate an already spiraling inflation."[1]

If undesirable consequences (in a macro-economic sense) result from proper valuation, taxation can be used to balance the system. Manipulation of the valuation of specific items is highly undesirable because such a practice distorts the information cues given to decision makers on a cumulative basis. These considerations lead to the conclusion that

1. "Special Report," *Business Week*, October 17, 1977, pp. 66–68.

different approaches may be adopted for different balance sheet items. For example, an investment in common stocks may be valued at market price, inventories at replacement cost, and depreciation at the estimated value of the service potential consumed by using specific price indices. This method has not been proposed widely in literature because most writers argue that internal consistency should exist between valuation bases used for different categories of assets.

Accountants Prefer Arbitrary Rules to Coping with Measurement Difficulties

The classic accounting debates of FIFO versus LIFO, historical cost versus replacement cost, straight-line versus accelerated depreciation methods were always effected by the argument of consistency ·of approaches. Actually, these dichotomies are not necessarily mutually exclusive as value should be contingent on the specific parameters measured. The use of the straight-line method of depreciation may reflect accurately the slow wear-and-tear in textile mills if there are no real changes in technology; however, in the case of computers used in production planning, an accelerated depreciation method may be more appropriate (because of obsolescence and the development of more cost-effective computers). Accountants are hesitant to reestimate the expected economic life of an asset (except in a write-off situation) or change the depreciation method based on the apparent loss of value of the asset. Accountants are not allowed to change between LIFO and FIFO methods based on the actual physical utilization of inventories. Accountants are not allowed to value certain real estate property at market price and other real estate property at historical cost contingent on liquidity. Accountants in their search for "comparability" sacrifice the critical nature of asset valuations in order to attain "consistency." The enforcement of generally accepted accounting principles would be more difficult and costly otherwise. However, real values may be so distorted by the standardization of rules that comparability may not be achieved. For example, a very efficient oil exploration operation with a few dry holes may look as bad as a very inefficient operation that has a high percentage of unsuccessful drilling if all expenses are capitalized and estimated reserves are not valued and recorded.

Accountants Often Select Rules That Are Economically Justified But Theoretically Unsound

The recent outcry against the disclosure of replacement cost data required by the Securities and Exchange Commission for the most

part has been directed at the absence of usefulness of the data, arbitrariness, excessive cost, and difficulties in measurement. Even though many academicians have supported the use of replacement costs in financial accounting on a theoretical basis, this fact generally has been ignored by practitioners. Further, even if replacement cost data are deemed sound, the accounting community will not accept that procedure because of its high incremental cost. Historical cost accounting is the simplest of the accounting methods. The estimation required is not difficult, and once a historical cost is recorded, a deterministic value is established. Generally accepted accounting principles are strongly biased in favor of rules which require the simplest and least expensive measurement techniques.

These axioms might lead us to postulate a series of specifications for a basic core of valuation procedures:

1. Different measurement standards should be used in different environments under a pre-specified relational system.

2. Procedures should anticipate the dynamic behavior of the elements of the representation system, such as changes in the relative value of assets purchased at the same cost, nonlinear changes in the value of assets, and so forth.

3. Stochastic estimation and representation should be used when such a representation is feasible and within the objectives of the measurements.

4. The "best" valuation procedure should be used for each item of the valuation system. This implies a mixed set of measurement procedures.

5. Arbitrary rules should be used as a substitute for direct measurement only when such rules are good approximations of the actual measurements and when there is no economic justification for more accurate measurement.

6. Valuation procedures that are based on the economics of information should take into consideration not only direct information-preparation costs but also the benefits of improved decision making.

These considerations find expression in a specification of a measurement system that integrates some of the key issues of the present controversy and relates a general statement of key valuation parameters.

A MATRIX ACCOUNTING REPORTING MODEL

An economic system is represented by the set S which, at its creation, is at S_o. Successive time periods will find S in states $S_1, S_2, \ldots S_t$.

Many different methods of representation can be found for system

S. S' may be a verbal description of the system, *S"* another representation composed of a vector whose elements are the balances of the accounts of financial statements, and *S** could be a mixed verbal and numeric representation (such as an annual report issued by a publicly owned corporation).

We shall adopt for the purposes of this paper the *S"* system of representation which, for the sake of simplicity, will be indicated as *S. S_{ij}* represents element *i* (for example, cash) of *S* in time period *j*. Debit balances are represented as positive numbers and credits as negative (see [Butterworth, 1972]). Subscript *j* of *S_{ij}* is a time parameter which relates to three key substates: the past *(j = 0 to t − 1)* period, the most recent *(j = t)* period, and future *(j = t + 1, t + 2, …)* periods. Measurements of past periods generally are included in annual reports for comparative purposes; future measurements (forecasts, pro forma financial statements) are not required disclosure items but exist internally in many systems.

Each individual element of the vector *S_{ij}* is the result of a measurement method (assumed to be consistent over time) which combines the value of items at previous periods with the most recent measurements. Butterworth [1972] defines the accounting system as represented by the following equation:

$$S_{kt} = US_{kt-1} + TV_t \tag{15.1}$$

In this equation, *U* is a unit vector with *k* elements composed of zeros and ones. Zeros close noncumulative accounts (i.e., income statement accounts) while ones provide the accumulation effect for cumulative accounts (i.e., balance sheet accounts). If *S* has *k* elements (by definition of the accounts to be considered in the representational system), *T* will be a matrix of *k* rows [corresponding to each element (account) of *S*] and *v* columns corresponding to each type of possible economic transaction effected during period *t*. The values within matrix *T* will be either 0, 1, or −1, contingent on the effect (none, debit, or credit, respectively) that the specific type of transaction corresponding to that column will have on the account represented by that specific row. Vector *V* will have *v* elements corresponding to each of its components to the cumulative amount transacted in period *t* for that specific transaction type.

Equation (15.1) can be verbally stated as that the economic status of the firm *(S_{kt})* equals its economic status at the beginning of the period *(US_{kt-1})* plus the economic effect of the transactions *T* that occurred during period *t*.

This representation is adequate for a static world which has a constant

currency value or for situations in which increments are infinitesimal. However, most systems are represented by discrete time representations in which the relative value of goods changes as a result of changes in the value of currencies. These factors require a restatement of equation (15.1) into:

$$S_t = \{(S_{t-1} \times U) + [p_t \times (T \times V_t)]\} \times A_t \qquad (15.2)$$

In this equation, the value adjustment vector A_t with k elements serves to reflect the dynamic characteristics of the change that occurred in each of the elements of vector S. The p factor included in equation (15.2) reflects the fact that transactions occur throughout a period, linearly or not, and an adjustment is necessary even in the representation of events from a single period (if linearity is assumed, the value of p_t will be .5). Therefore:

$$p = f(A, \text{time}) \qquad (15.3)$$

The actual change in the value of an element is only formally recorded under GAAP for plant assets through the calculation of depreciation. This is an oversimplification of a set of factors that affect the value of an element of a financial statement or of an item on a less aggregate level. These effects can be represented either through vector A below or through a set of formalized procedures that incorporate the calculation of A_t by creating journal entries for its perceived value.

$$A_t = f \text{ (valence, physical wear, relative value change,}$$
$$\text{obsolescence, other)} \qquad (15.4)$$

Here "valence" (see [Ronen and Livingstone, 1975]) represents the change in the intrinsic behavioral value of all items combined to form the aggregate that represents that specific element; "physical wear" represents the actual loss of value of the items that compose element i due to usage or time; "relative value change" is the effect of macro-value changes of elements due to macro-economic change in factors such as supply, demand, and prices; "obsolescence" is the effect of techno-logical change on the value of the specific items; and similar components such as change in the interest rate are included in "other." Note that these five major parameters of the value of each element of the adjustment vector have a different effect on different items (components) of each element (e.g., buildings) and across the different elements (e.g., plant assets). For example, cash is mainly affected by general price level changes, and plant assets are the only element for which all five parameters are of major importance.

Each element of S can be represented using the following expression:

$$|S_{ij}| = [(|S_{ij-1}| \times |U_i|) + \tfrac{1}{2} \times \|T_i\| < \|V_{ij}\|] \times \|A_i\| \quad (15.5)$$

Elements are represented within single bars and vectors between double bars. The cumulative effect of past periods and the adjustment factor can be observed in equation (15.5). The adjustment factor A_i for element i (e.g., bonds payable) is the result of an aggregation of the purchasing power needed to purchase a given set of commodities (which act as a reference) in the international market at time $t - 1$ and the same set of items at time t. For example, if a firm holds $1,000,000 of 4.5 per cent and $1,000,000 of 7 per cent bonds (both at face value) rated by Moody's as an A bond at December 31, 1976, and the same bonds at December 31, 1977, except that Moody's rating changed to B and the interest rate increased by 1 per cent in the money markets, the adjustment factor could be calculated as follows:

$$A_i = \frac{\Sigma \text{ Bonds Market Value}_{1976}}{\Sigma \text{ Bonds Market Value}_{1977}} \quad (15.6)$$

A_i will reflect the change in the interest rate in a nonlinear (exponential) manner, a valence effect due to the change in Moody's rating and the relative value change attributable to the changed command of the dollar over commodities (oil, coffee, and so forth).

This matrix model, despite its power in representing aggregate transactions, is not particularly good in dealing with differential transactions which reflect profits. These have to be recorded as two transactions (the sale and the disposal of inventory), and the normal gross profit margin must be used to record the transaction. The retained earnings element can be used as the "linkage" register to which revenue is credited and expenses are debited. However, "adjustments" will not balance unless the retained earnings adjustment is calculated with such a purpose in mind. Under static conditions, the following equation should be valid:

$$S_{REt} = \int_{T=0}^{t} S_{REt} \times dt \quad (15.7)$$

In this equation, S_{REt} is the balance of the retained earnings element at time period t. The integral represents the summation of all increments in retained earnings between times 0 and t. Even though it is theoretically consistent, equation (15.7) should be adjusted for changes in the value of the retained earnings:

$$S_{REt} = \int_{0}^{t} A_i S_{REt} \times dt \quad (15.8)$$

Equations (15.7) and (15.8) when solved for most retained earnings functions would lead to a nonlinear (differential) change function,

indicating the limited adequacy of linear adjustments. In order to preserve the integrity of the par value of common stock (which allows the calculation of the number of outstanding shares) and to avoid the complexity of expression (15.8), another element may be added in the owners' equity section of the balance sheet, following the example of many other countries (e.g., Brazil). This element could be called "equity from capital value change" and would become after a number of years one of the largest items in the balance sheet. A better and more representative solution to this problem is the adoption of the "adjustment" concept and the periodic redefinition of the par value of common stock.

The foregoing model, one of very general characteristics, presents a series of interesting measurement/implementation issues and serves also as a framework to pinpoint the sources of disagreement on representation issues that comprise the accounting system.

ILLUSTRATION

A taxicab company of the kind proposed by Sterling in the Introduction to this book is being considered. Its financial reports are designed as very aggregate (see Figure 15-1) for illustration purposes.

The various accounts will be represented in the vector S of eight elements. The transactions vector (V) will encompass the following transactions:

(V_1) Invest capital
(V_2) Collect revenue
(V_3) Pay commissions
(V_4) Value changes
(V_5) Buy taxicabs
(V_6) Other expenses

The accounts (displayed in Figure 15-1) and the transaction vector

The Chart of Accounts

Balance Sheet		Income Statement
Cash (S_1)	Ret. earnings (S_3)	Sales (S_5)
Plant (S_2)	Capital (S_4)	Cost of goods sold (S_6)
		Value changes (S_7)
		Income (S_8)

Figure 15-1

V described above lead to the transaction matrix in Figure 15-2.

The historical development of Taxicab, Inc. follows: The firm was created on the last day of time period 0 by an investment of 100 (say, thousands of dollars). Therefore,

$$V_0 = (100, 0, 0, 0, 0, 0)$$

Here we have a negligible need for adjustment as the economic transaction occurred in the last day of the period, therefore

$$A_1 = (1, 1, 1, 1, 1, 1)$$

The simplifications adopted in this problem allow the utilization of the relationship: $V_3 = PM \times V_2$ where PM is the overall profit margin for *TI*. The financial reports for time period 0 would be calculated as:

$$S_0 = (S_{-1} \times U + T \times V_0) \times A = (100, 0, -100, 0, 0, 0, 0)$$

At the first day of time period 1, the company bought taxicabs at 10 each (eight for the cab and two for the meter). Taxicabs average a 30 yearly revenue, drivers are paid 70 per cent commissions, and repairs amount to 10 per cent of revenue.

The critical factor is the value of the cabs after one year of use. Traditional accounting treatment simply assumes linear and constant depreciation. However, the value of the taxicabs could be directly estimated by their present "Blue Book" value. It is clear that a taxicab incurs an immediate loss of value the moment it leaves the dealer (wholesale minus retail cost). The same effect is verified in the purchase of marketable securities when there will be a transaction cost in liquidating purchased securities. In addition to this transaction cost,

	V_1	V_2	V_3	V_4	V_5	V_6
S_1	1	1	−1	0	−1	−1
S_2	0	0	0	−1	1	0
S_3	0	−1	1	1	0	1
$T = S_4$	−1	0	0	0	0	0
S_5	0	−1	0	0	0	0
S_6	0	0	1	0	0	0
S_7	0	0	0	1	0	1
S_8	0	−1	.1	1	0	1

Figure 15-2

there is a change in the cost of new taxicabs of the same model because of the increasing emphasis on small cars. Thirdly, some of the taxicabs are used considerably more than others. Fourth, because of the limited number of taxicab licenses available, the value of the taxicab meters increase by 50 per cent.

This example allows for the use of an easy valuation method when transaction costs, physical wear, valence, and the relative values of the commodity are also considered: the "Blue Book" value. In most situations, valuation procedures will be complex and cost-benefit considerations should determine the effort placed into and/or the accuracy attempted for the value measurement. Book value as such is a misnomer, for it does not serve any objective decision-support purpose [Study Group on the Objectives of Financial Statements, 1973] except that it simplifies the measurement task. A better asset valuation procedure might be to study the behavior of car prices, to prepare a model of this behavior, and to use the model to obtain asset valuations at any point in time. Income tax considerations yield to costing and valuation procedures. Straight-line versus accelerated depreciation methods and LIFO versus FIFO are among many controversies created by unwarranted oversimplification by accountants.

The financial results for the taxicab company would be developed as shown in Figure 15-3.

The simplified matrix example in Figure 15-3 allowed the direct insertion of the asset value change effects, as the only one considered was a straight-line depreciation of sorts which was part of the accounting process and not an external adjustment. In a more complex situation, vector A would be calculated and used. This solution, which emphasizes the changes in the value of plant assets, does not deal with the need to compare the financial statements with previous periods (where a simple index type multiplication should be used to assess the comparative elements of previous years) or with future statements (where extrapolations should be based on adjusted historical values mounted on structural changes due to value effects). The simplified procedure here presented would be made considerably more complex with aggregate or even item-by-item revaluation of each element. In theory, based on the model presented in Figure 15-3, each element should be brought forward to its realization value and cost-benefit considerations should guide the extent and depth of this valuation effort. When any (or all) parameters that affect the value of an item cannot be assessed, this parameter will have to be ignored. The question of liquidity is only relevant in certain cases (when the liquidation of the item is contemplated or needed) and can be replaced by a judicious and

which leads to

$S_1 = \begin{pmatrix} 100 \\ 0 \\ 0 \\ -100 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \times \begin{pmatrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \end{pmatrix}$

no capital paid-in

10 cars @ 30

−25% change in the value of cars,

50% change in the value of meters

$V_1(1) = 0$

$V_1(2) = 300$

$V_1(3) = 300 \times .7 = 210$

$V_1(4) = -20 + 10 = -10$

$V_1(5) = 100$

$V_1(6) = 300 \times .1 = 30$

$$\begin{pmatrix} 1 & 1 & 0 & 1 & 0 & 0 & -1 \\ 0 & 0 & -1 & 0 & -1 & 1 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 & 1 \\ -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -1 & 0 & -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 & 0 & 1 \end{pmatrix} \times \begin{pmatrix} 0 \\ 300 \\ 210 \\ 10 \\ 100 \\ 30 \end{pmatrix} = \begin{pmatrix} 100 \\ 0 \\ 0 \\ -100 \\ 0 \\ 0 \\ 0 \end{pmatrix} + \begin{pmatrix} -40 \\ 90 \\ -50 \\ 0 \\ -300 \\ 210 \\ 40 \\ -40 \end{pmatrix} = \begin{pmatrix} 60 \\ 90 \\ -50 \\ -100 \\ -300 \\ 210 \\ 40 \\ -40 \end{pmatrix}$$

Figure 15-3

progressive apportionment of original costs restated to present price levels through the use of appropriate indices.

CONCLUSIONS

The classic controversies have not helped in the solution of the valuation of the economic status of a system. A very important statement on objectives of financial statements [Study Group on the Objectives of Financial Statements, 1973] is surrounded by a set of false controversies, such as LIFO and FIFO inventory valuation methods, methods of depreciation, or ways of accounting for business combinations.

Even more dysfunctional are the major controversies of accounting *"for inflation."* Even in the most extreme case of an inflationless world, if dynamic economic activity exists, items will change in relative value and should be valued accordingly. Exit-value valuation is meaningless in situations where "exit" is not intended or possible. General purchasing power [Financial Accounting Standards Board, 1974a] creates a concept (general price level indices to be applied to plant assets) that is difficult to evaluate and neglects the key components of these effects. Current value accounting ([Touche Ross & Co., 1975], [Barton, 1975]) creates difficult cost-benefit situations wherein the valuation of items may be too costly for the economic benefits of its measurement.

The accounting system should have a core of basic principles and consist of an empirically derived mix of stochastic rules that are:

(a) cost justifiable in terms of benefits to the economic decision process,

(b) representative of the economic status of the system it represents,

(c) not based on arbitrary rules but rather on rules that attempt to approximate measured processes,

(d) stochastically stated if at all possible,

(e) subdivided into components and quantified whenever possible,

(f) designed to represent the economic activity of the system at exactly the stated point in time,

(g) used to present historical financial statements that compare money units of similar purchasing power, and

(h) composed of the same measurement techniques over time.

These considerations lead to some suggestions for additional research:

1. The ultimate solution for coherent valuation of economic activity and assets probably will be found in a "mixed approach," not a theoretically "pure method approach."

2. Very little is known on actually *how* assets change in value and

what are the components that affect these changes in value.

3. Considerable work is needed in stochastic measurement of economic phenomena.

4. Fixed rules cannot replace intelligent valuation reasoning. Although the reliance on fixed rules frequently is defended on grounds of "comparability," bad accounting representations inevitably result.