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PHYSICAL CAPITAL : AN EXAMINATION*

by
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[Introductory note: Robert R. Sterling is Francis G. Winspear Distinguished Professor of Professional Accounting at the University of Alberta. He holds the Gold Medal of the AICPA for 1969 and 1974, the highest research prize awarded by that organization. Professor Sterling was the first Distinguished International Lecturer of the American Accounting Association.

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There is no less merit in keeping what we have got, than in first acquiring it. Chance has something to do with the one, while the other will always be the effect of skill. -- Ovid

Keeping what we have got requires skill in any circumstances. Inflation makes it difficult and double-digit inflation makes it doubly difficult. In a commendable attempt to aid users by reflecting inflationary effects, accountants have been honing their skills. Many accountants have noted that in times of increasing prices, if historical cost income is paid in dividends, it does not provide the firm with adequate funds to keep what we have got -- the ability to replace physical units declines -- and therefore historical costs produce "false profits." The proposed solution is to use current costs. The argument is that "true profits" are those figures that reflect an increase in physical capital because that is the amount that can be paid in dividends without reducing the number of physical units of the firm.

Purpose

The modest goal of this article is to clarify the concept of physical capital. Evidence of the need for clarification is provided by FASB's indecision in FAS 33. The alternatives of (1) maintaining financial capital versus (2) maintaining physical capital were clearly and correctly stated in FAS 33 (§97b) and a choice was previously made in the Exposure Draft but FAS 33 (§104) does not make a choice. Instead, FAS 33 (§124, 131) refers to the views of *some* Board members and such statements in conjunction with the failure to make a choice provide ample evidence that the Board is split on this issue.

The basic difference between financial and physical capital is that the former seeks to measure a monetary or value attribute and the latter a physical attribute. This is a crucial distinction: the choice of (1) versus (2) requires that we address the fundamental question of *what attribute* we should account for. Obviously the question of the attribute that we account for goes to the very foundation of accounting thought and practice.

A corollary of the difference in attributes is a difference in reported income: the write up to current cost

is credited to income in the financial option but that write up is credited to equity in the physical option. That is, *both* options adjust the assets to current cost but the former takes that adjustment to *income* and the *latter* to *equity*. Physical capital proponents insist that the write up to current cost should be taken to equity, not income for the straightforward reason that the write up does not reflect a change in physical capacity. Thus, some Board members would take the write ups directly to shareholders' equity, bypassing the income statement. Financial capital proponents insist that the write up is income for the equally straightforward reason that it is an increase in monetary capacity. Thus, some Board members would term the write ups "holding gains" and take them to the income statement. Obviously the two options will result in significant differences in reported income.(1)

It is not my purpose to review or critique FAS 33. Instead, my primary purpose is to clarify the concept of physical capital by casting it in a simple and easily understandable context. My secondary purpose is to state the arguments that I use in choosing between financial and physical capital. If I achieve the primary purpose, it should advance accounting thought in general, as well as advancing the deliberations of FASB, regardless of the ultimate choice. A choice, however, is imperative both for the well being of accounting and for the well being of FASB. For the well being of accounting, indecision results in a proliferation of income numbers which can exist only on pain of vast confusion. In regard to the well being of FASB, recall that a major criticism of its predecessors, perhaps a major factor in their demise, was the inability to make a choice when presented with alternatives.

In this article I will focus exclusively on the physical capital version of current costing: I will not consider the financial capital version or the more general question of current costs versus other valuation proposals. First, the background of physical capital will be briefly reviewed; second, the false profits criticism of historical costs will be explained; third, the nature of the true profits produced by physical capital-current costs will be explicated and the advantages claimed will be stated; fourth, the tacit assumptions of physical capital will be revealed and the consequences of their violation will be examined. Finally, I will show that the fundamental question of *what* attribute we should account for raises the equally fundamental question of *who* we should account for.

Background

The proposal to measure physical capital has been with us, in one form or another, for a very long time. It was a major factor in the ancient LIFO-FIFO debate. Proponents of LIFO coined the terms "false profits" and "fool's profits" because if FIFO income was paid in dividends, it resulted in a decline of physical capital. Since the argument for LIFO was based on physical capital, the natural progression was to NIFO -- next in first out -- which was permitted in some cases. NIFO is, of course, merely another name for current cost of inventory. Another form of the proposal arose in the equally ancient debate over price level adjustments. Although there was fairly widespread agreement that price level adjustments were needed, there was disagreement about the kind of price index that should be used: some favored a general index and others a specific index. Those who favored a specific index argued that a general index did not reflect the pattern of purchases of the firm being accounted for and, therefore, it was inappropriate to use a general index. A firm specific index was more appropriate and the natural progression was to an asset specific index. Adjusting historical costs by an asset specific index is, of course, merely another way of reflecting current costs.(2)

In 1961 the theory of replacement costing was presented by Edwards and Bell. They proposed to value assets at replacement cost and to bifurcate income into "current operating profits" -- revenues less current costs -- and "holding gains" -- the increase in costs. Their argument against historical cost income was that it deferred the reporting of holding gains until they were realized instead of reporting them when they occurred or accrued thereby reporting false profits. The work gradually gained supporters, mainly from academe, but it also met strong resistance, mainly from practice, primarily because it violated the realization convention. Some of the holding gains were write ups of assets that were unsold or unused and therefore unrealized. There were precedents in practice for writing up assets to current cost but the credit had been to appraisal surplus, not income.

Several debates ensued. Some debated the merits of replacement costing while others debated the proper interpretation of replacement costing. Rosenfield, for example, presented cogent criticism of replacement costing as well as lucid expositions of the distinction between price level adjustments and replacement costing. There were many who debated the proper interpretation of replacement costing culminating in Revsine's provision of a theoretical base different from Edwards and Bell but with the same conclusions. Revsine adopted a physical measurement system but contrary to the physical capital proponents he considered holding gains to be income. But these were theoretical debates which had no effect on practice. The APB had already rejected the Moonitz and Sprouse-Moonitz research studies and therefore it appeared that practice was safely insulated from replacement costing. The SEC broke through that insulation in 1976 with the issuance of ASR 190 requiring disclosure of replacement costs. This brought many practitioners into the debate, most of whom were opposed. It also resurrected the academic debates about the proper interpretation. One notable reaction to ASR 190 was Johnson and Bell's charge that it was a misinterpretation of replacement costing. It was notable both because of its cogency and because Bell was the co-author of the seminal book -- Edwards and Bell -- and was the former professor of Sandy Burton, the architect of ASR 190. In effect, Professor Bell graded student Burton's paper and found it wanting. Thus, practitioners resisted ASR 190 because it was replacement costing and academics resisted it because it was not the proper interpretation of replacement costing.

In the debate over the proper interpretation of replacement costing many refinements were proposed. One recurring theme was that holding gains are not income because they are not realized. (For a recent argument that holding gains are not income for other reasons see Samuelson.) In effect, these proponents of replacement costing wanted to truncate the income statement at current operating profit, eliminating the holding gains. The elimination of holding gains allows one to avoid violation of the realization convention or, to put it positively, reporting only current operating profit allows one to embrace both replacement costing *and* the realization convention. In addition it is even more conservative than historical cost income because it eliminates realized holding gains as well as unrealized holding gains.

By more than mere coincidence current operating profit is exactly the same as "operating income" in the physical capital proposal. Operating income is the amount that can be distributed without impairing physical capital and therefore it is also known as "distributable income" or, in Revsine's replacement costing terminology, "distributable operating flows."

Thus, the two proposals converged. Replacement cost income less holding gains is exactly the same as physical capital income. The confluence of the adherents of these two proposals swells the support for reporting operating income as well as undermining the opposition based on the violation of the realization convention. Additional opposition was dissipated when the idea of multi column financial statements was introduced in the academic literature and interpreted as supplementary statements in practice. Recognition that physical capital statements could supplement instead of supplant historical cost statements subsumed the proposal under the hoary concept of additional disclosure. In short, the effect of the refinements was to add supporters from other camps and to quiet the opposition. The trend was one of increasing support and decreasing resistance and that trend seems to be continuing.

The present widespread support is evidenced by Standard Setters in Australia, Canada and the U.K., all opting for current cost/physical capital methods of reporting at least in the Exposure Draft stage. In the U.S., as noted above, FASB is divided on this issue and has presented a compromise. Those Board members who support physical capital present their case in FAS 33:

Erosion of physical capital (or erosion of operating capability) may be regarded as the failure to retain sufficient financial resources to acquire assets needed to maintain the capacity of the enterprise to provide a constant supply of goods and services. The concept of physical capital erosion may be linked to a concept of distributable income where distributable income is defined as the amount of cash that may be distributed without reducing the operating capability of the enterprise. (§124.)

[C]osts must be measured at current cost in order to provide for the maintenance of operating capability. Assume, for example, that inventory is purchased for \$1,000 and sold for \$1,500 at a time when current cost is \$1,200. Although historical cost-nominal dollar income is \$500 (\$1,500 less \$1,000), distributions may be limited to \$300 (\$1,500 less \$1,200) to maintain operating capability. Costs are measured at \$1,200 in order to provide for the replacement of inventory out of revenues. An increase of \$200 (\$1,200 less \$1,000) *in current costs would not be regarded as part of income* under concepts that address maintenance of physical operating capability. (§125, emphasis supplied.)

In brief, the argument is that historical cost/nominal dollar accounting produces false profits because of the need to replace the inventory at its current cost and that the difference between current cost and historical cost is not income for the same reason.

In summary, the proposal to measure physical capital has a very long history. It has roots in practice -- LIFO and appraisal surplus -- as well as in theory -- specific price indices and replacement costing. Support is growing, having become sufficient to be adopted or exposed in other English speaking countries, and having become sufficient to cause FASB to retract its choice in the exposure draft and to compromise in FAS 33.

Given the history and the widespread support, it is most curious that the literature on physical capital is exceptionally sparse. The quotation from FAS 33 above is a typical statement of the case for physical capital both in regard to content and brevity. It seems that the widespread support for physical capital is based on the intuitive appeal of such brief statements. Surely the fundamental nature of the question of what attribute that we account for requires a much more intensive and extensive analysis. The trend toward adopting physical capital in all English speaking countries, including the promise to review and revise FAS 33 (15) in not more than five years, makes the provision of such an analysis especially urgent. My hope is that the following remarks will motivate others to provide the more intensive and extensive analysis so that physical capital will either rest on a bedrock foundation or be abandoned if its intuitive appeal does not withstand such analysis.

False Profits

The argument that historical cost income results in false profits can be clearly seen by considering a simple merchandising firm. Assume that the firm starts with \$100 cash on January 1 and buys 100 units for \$1.00 each on January 2. On January 31 it sells all the units for \$1.60 each and pays its income in dividends. The combined financial statements appear in Exhibit I.

Exhibit I Measuring NOD Merchandising Firm Combined Financial Statements

	Jan 1	Month of Jan	Feb 1
Cash	\$100		\$100
Shareholders' Equity	\$100		\$100
Beginning Retained Earnings	-0-		-0-
Sales		\$160	
Cost of Goods Sold		100	
Net Income		60	
Less Dividends		60	

Change in Retained Earnings	-0-	-0-
Ending Retained Earnings	-0-	-0-
Total Equity	\$100	\$100

Examination of Exhibit I reveals that there is absolutely nothing false about any of the figures. It accurately reflects the easily measurable attribute of **Number of Dollars (NOD)**. The NOD on hand at January 1 and February 1 was in fact \$100 and that could be readily empirically tested or, as we also say, readily audited. The increment (net income) in NOD during January was \$60 which is also readily auditable. Since the figures conform to empirically testable facts, they must be characterized as true and those who claim them to be false are mistaken.

The basis of the mistaken claim that the figures are false is that they do not reflect physical capital. Proponents of physical capital want to measure Specific Units Purchasable (SUP), not NOD. To obtain a direct measurement of SUP the only thing required is to divide the February 1 NOD figures by \$1.25, the current cost on that date. This division restates the dollars as equivalent units purchasable, i.e., \$100 would purchase 100 units on January 1 but \$100 will purchase only 80 units on February 1. Thus, there is a decline in physical capital of 20 units. In the same fashion, the sales of \$160 is divided by \$1.25 to obtain the equivalent units purchasable of 128 from which is deducted the 100 units sold to yield the "true profit" of 28 units. The problem is that the \$60 NOD profit was paid in dividends which is equivalent to 48 units ($=\$60/\1.25) resulting in the decline of 20 units in physical capital. (Cf. FAS 33 ¶100b, 125.) Exhibit II displays all of these SUP figures.

Exhibit II Measuring SUP in Units

Merchandising Firm Combined Financial Statements

	Jan 1	Month of Jan	Feb 1
Cash	100 units		80 units
Shareholders' Equity	100 units		100 units
Beginning Retained Earnings	-0-		-0-
Sales		128 units	
Cost of Goods Sold		100	
Net Income		28	
Less Dividends		48	
Change in Retained Earnings	-0-		(20)
Ending Retained Earnings	-0-		(20)
Total Equity	100 units		80 units

All of the figures in Exhibit II are also true in that they conform to empirically testable facts. (3) Thus, both Exhibits are true. The distinction is that they measure different attributes, not that one is true and the other false.

Of course, it cannot be denied that Exhibit I gives a false measure of SUP. It overstates SUP profit by 20 units. As a result 20 units of SUP capital was paid out and therefore SUP assets declined by 20 units.

If this trend continues, so the argument goes, the firm will dwindle and eventually die. If income taxes are levied on the basis of NOD, it is possible for those taxes to be greater than SUP profit and therefore confiscatory, i.e., a tax on SUP capital. It is on the basis of these evils that NOD profit is said to be false.

True Profits

Physical capital proponents want to avoid the aforementioned evils by measuring SUP. They propose to measure SUP by adjusting the historical costs to current costs in the following entry:

Inventory	\$25
Shareholders' Equity	\$25

This entry writes up the 100 units from the \$1.00 per unit historical cost to the \$1.25 per unit current cost. All -- both physical and financial capital -- current cost proponents are agreed that the asset accounts should reflect the current cost. Hence the most general proposition of current cost accounting is:

Proposition 1: Asset accounts should reflect the current cost, not the historical cost, of the assets.

All physical capital proponents agree that the adjustment should be taken to equity, not income. The argument is that the original capital invested was 100 units and that this has not changed. It is incidental that the 100 units was expressed as \$100 originally and is now expressed as \$125. Since the only thing that has changed is the dollar expression, since the underlying physical capital has not changed, the adjustment cannot be considered income -- it is an equity adjustment. Thus, the second proposition of physical capital current costing is:

Proposition 2: Differences between current costs and historic costs are equity adjustments, not income.

After the adjustment to inventory, as given in the above entry, the recording of cost of goods sold is straightforward:

Cost of Goods Sold	\$125
Inventory	\$125

The purpose of charging the current cost against revenues is to get the net income to reflect the change in units. This idea may also be stated as a general proposition:

Proposition 3: Income is the change in physical capital and is determined by deducting current costs from revenues.

The above adjustment to inventory can be backed up to an adjustment to cash. The \$100 cash was used to purchase 100 units of inventory

Exhibit III Measuring SUP in Dollars

Merchandising Firm Combined Financial Statements

Jan 1 Month of Feb 1

	Jan	
Cash	\$125	\$125
Shareholders' Equity	\$125	\$125
Beginning Retained Earnings	-0-	-0-
Sales	\$160	
Cost of Goods Sold	125	
Net Income	35	
Less Dividends	35	
Change in Retained Earnings	-0-	-0-
Ending Retained Earnings	-0-	-0-
Total Equity	\$125	\$125

The January 1 figures are stated at the current cost as of February 1. (4) The Cost of Goods Sold is also stated at the current cost resulting in a \$35 SUP net income as contrasted to the \$60 NOD net income. The smaller net income results in smaller dividends being paid and hence more cash retained in the firm. (Cf. FAS ¶124.)

But it would now require \$125 to purchase the same number of units. Thus, the January 1 cash should be stated at \$125 to reflect the fact that it would require that amount on February 1 to purchase the 100 units. The effect of these propositions and entries is displayed in the combined financials in Exhibit III.

These dollar figures are intended to reflect physical capital -- the objective is to measure SUP, not NOD. That this objective has been achieved can be seen by dividing all the figures in Exhibit III by \$1.25. The quotients of such divisions are displayed in Exhibit IV.

Exhibit IV Measuring SUP in Units

Merchandising Firm Combined Financial Statements

	Jan 1	Month of Jan	Feb 1
Cash	100 units		100 units
Shareholders' Equity	100		100
Beginning Retained Earnings	-0-		-0-
Sales		128 units	
Cost of Goods Sold		100	
Net Income		28	
Less Dividends		28	
Change in Retained Earnings	-0-		-0-
Ending Retained Earnings	-0-		-0-
Total Equity	100 units		100 units

This is said to prove that the true profit is \$35 since that is the dollar expression of the increase in units purchasable arising from sales.

The proponents of physical capital claim that this measure produces a number of advantages. First, it aids *dividend policy*. As we have seen, if dividends of more than \$35 are paid, the physical capital is reduced. SUP income is sometimes called "distributable income" to indicate that it is the amount that can be distributed in dividends without reducing physical capital. (Cf. FAS 33 ¶124.) Second, it aids *tax policy*. (Cf. FAS 33 ¶94b.) If income taxes were based on SUP income, it would prevent taxation of capital under the guise of taxing income. For example, in the case at hand, if an income tax rate of 60% or greater were based on NOD income, it would reduce the specific units purchasable thereby, in fact, being a tax on physical capital.

All proponents are agreed on the above advantages. Many go further and argue that it also aids *price policy*. Some argue that selling prices are in fact a function of current costs. FAS 33 (¶117), for example, alludes to the possibility of selling prices being closely related to current costs. Other argue that management should establish a policy of setting selling prices on the basis of current costs. The suggestion is to apply the markup rate to current cost instead of historical cost in order to gain the same increase in physical capital that would have been had there been no change in purchase price. In this case the markup rate of 60% is applied to the \$1.25 current cost to yield a sales price of \$2.00. See Exhibit V.

Exhibit V
Markup applied to Current Cost

Merchandising Firm
Comparative Income Statements
Month of January

	Constant Cost		Increasing Cost	
	(1)	(2)	(3)	(4)
	Dollars	Units	Dollars	Units
Sales	160	160	200	160
Cost of Goods Sold	100	100	125	100
Net Income	60	60	75	60

If purchase prices had remained at \$1.00, as in column (1), the SUP income would have been \$60 which is equivalent to 60 units as shown in column (2). In order to obtain the same increase in units, as shown in column (4), we must base the markup on the increased purchase price and thereby increase the revenue to \$200. To put it negatively, if the markup of 60% is based on historical cost, the result is an increase of 28 units, as shown in Exhibit IV, instead of the increase of 60 units originally planned. Applying the same markup rate to current cost allows the firm to earn the same SUP income as it would have earned had there been no increase in purchase price.

Those who make this suggestion argue that such an increase in sales price is likely to be possible because competitors who purchase at a later time will incur the increased cost and therefore will want to markup on that basis. In this case competitors will purchase the units at \$1.25 each and therefore will be forced to sell at \$2.00 in order to earn a 60% gross margin. Thus, in general, firms can be competitive with the sales price based on current cost.(5)

Up to this point the discussion has focused on the advantages of this pricing policy that would accrue to the *firm*. Note also that it has advantages for the *owners* of the firm. The distributable income --

dividends payable without decreasing physical capital -- would have been \$60 had purchase prices remained constant. With the selling price based on the current cost the distributable income is \$75. Thus, if the profit is in fact distributed the owners will receive an additional \$15. Since owners do not purchase the specific units of inventory from their dividends and are likely to be interested in their capacity to purchase consumer goods from their dividends, the fact that \$60 and \$75 are equivalent in terms of SUP is not relevant to them. Instead, the consumer price index is relevant to determining the owners' relative well offness, but regardless of where the consumer price index stands at the time of the receipt of dividends, \$75 will always purchase more than \$60 and therefore the owners are always better off from constant markups on increasing purchase prices. The situation is truly Utopian: the *firm* is *equally* as much better-off and the *owners* are *more* better-off from using this method of accounting and the attendant pricing policy. For this reason, many managers and owners are strong supporters of the physical capital proposal. (6)

Another advantage to owners and others is the *predictive power* of SUP profit. (Cf. FAS 33 ¶116-123.) Many proponents base their entire argument for adopting SUP profits to predict future SUP profits. Since SUP profit is distributable income -- the maximum amount that can be paid in dividends without reducing physical capital -- then dividends equal to SUP profit will allow physical capital to be maintained at the same level and therefore allow SUP profits to continue at the same level.

Since share prices are the discounted value of future dividends, this aids owners in the valuation of their share prices. For example, we noted above that dividends increased from \$60 to \$75 due to the constant markup being applied to the increased current cost. This means that share prices would increase 25% to reflect the discounted value of the 25% increase in dividends since present SUP profits are good predictors of future SUP profits and SUP profits can be distributed without impairing physical capital.

One of the more straightforward arguments for the predictive power of SUP measures was presented by Revsine and Weygandt (p. 75):

(1) "[T]he value [present price] of a firm's ownership shares is determined by the level of its cash operating flows." (2) "[A]t a minimum management can be assumed to be constantly striving to maintain existing share prices." (3) "[I]n order to maintain existing share prices management must maintain operating flows at their current level." (4) "[M]anagement's primary controllable variable in attempting to maintain operating flow levels is to maintain the prevailing physical level of operations on the assumption that the margin between input and output prices will remain constant." (5) "[A]dopting as the objective of accounting] the primacy of cash flow predictions... whichever inflation accounting method generates an income figure that best reflects the maintenance of the physical operating level of the firm ought to be preferred.

Therefore, SUP measures are preferred. Not only can they be used to predict cash operating flows of the firm they can also be used to predict dividends of the owners thereby meeting the objective of providing information useful to investors for predicting, comparing and evaluating potential cash flows.

Numerous other advantages of SUP measures are claimed. Current costs are said to be a *surrogate* for net present value of future cash flows and SUP profits a *surrogate* for "economic income" (change in net present values). Since many consider net present value to be the "ideal measure" that cannot be obtained for practical reasons, a surrogate is almost ideal. (Cf. FAS 33 ¶ 132-133.) *Assessing managerial effectiveness* is also aided by SUP measures because management has control over the quantity of physical units but does not have control over prices. Therefore owners can judge the quality of managerial decision by focusing on what they can make decisions about. For the same reason managers should be considered stewards of the physical units and therefore SUP measures best meet the *stewardship* objective. There are other advantages claimed for SUP measures but enough has been said for the present since my sole purpose is to indicate that the proponents believe that SUP measures dominate other alternatives in all, or almost all, respects.

In summary, SUP measures are said to be true because they reveal the physical capital of the firm. In addition, such measures are said to provide advantages for formulation of dividend policy, tax policy and price policy, as well as having predictive power, being a surrogate for ideal measures, aiding in assessing management and providing the best report on stewardship. For these reasons, the proposal has rather wide appeal and support from influential groups.

Limitations

Careful examination of physical capital proposals reveal three crucial, albeit usually tacit, assumptions:

- (1) The firm continues to replace *identical* units;
- (2) Costs (purchase prices) continue to *increase*; and
- (3) The firm buys and sells in *different* markets.

I will examine the consequences of the violation of each assumption individually.

Different Units. As long as a firm replaces identical units, we can report empirically testable SUP measures as demonstrated above. But what happens if the firm changes the kind of units that it purchases? Such changes do not violate the going concern assumption; indeed they are regular occurrences in long-established firms. Macys and Gimbel's, for example, purchase and sell mini skirts one season and then purchase and sell maxi skirts the next season. How does one employ a measure of physical capital when the units change from minis to maxis?

To make the example concrete assume that Macys starts with \$100 on January 1, purchases 100 minis at \$1.00 each on January 2, sells 100 minis at \$1.60 each on January 31 when the current cost of minis is \$2.00, and replenishes its inventory on February 2 with maxis at a cost of \$1.25 each, that cost having increased from \$1.20 each on January 2. Even though the case is simple there are several different asset and income figures that can be derived. Two of the more obvious arguments are:

- (1) The firm actually bought minis and therefore the measurement ought to be based on the cost of minis. On this basis a \$40.00 loss would be reported. The \$160.00 cash will purchase 80 minis at \$2.00 each on February 1; the \$100.00 cash will purchase 100 minis at \$1.00 each on January 1; the decrease in ability to purchase minis is 20 which at \$2.00 each is a \$40.00 loss.
- (2) The firm actually replaced with maxis and therefore the measurement ought to be based on maxis. On this basis \$55.84 profit would be reported. The \$160 cash will purchase 128 maxis at \$1.25 each on February 1; the \$100 cash will purchase 83.33 maxis at \$1.20 each on January 1; the increase in ability to purchase maxis is 44.67 which at \$1.25 each is a \$55.84 profit.

We have a choice of reporting a substantial profit or a substantial loss from the same set of facts. Which figure do we report? The criterion used by physical capacity proponents is truth, but examination reveals that the alternatives are equally true. The choice is S_nUP (for minis as the basis) versus S_xUP (for maxis as the basis), not truth versus falsehood. S_nUP is true in that 100 minis were purchased on January 2 and 80 minis could have been (but were not) purchased on February 2. S_xUP is true in that 128 maxis were purchased on February 2 and 83.33 maxis could have been (but were not) purchased on January 2. Thus, any defense or criticism of one applies with equal force to the other: either both are true or both are false since both contain one factual purchase and one counterfactual purchase. Thus, we have returned to the fundamental question: what attribute should we account for? The only difference is that we now face the choice of S_nUP versus S_xUP instead of NOD versus SUP. I confess that I do not know the answer. I fear that physical capital proponents also do not know the answer because insofar as I am aware the question is never addressed.

A digression to discover how FAS 33 would answer the question will illustrate the difficulty of the answer as well as the concealment of the question. Based on the definition of current cost it appears that FAS 33 would prefer option (1). It emphasizes that current cost refers to the asset owned (§99f) as opposed to replacement cost which is defined as the current purchase price of "the best available asset to undertake the function of the asset owned" (§99c). In this case the assets owned at time of sale were minis and maxis are the best available asset to under-take their function. It is not at all clear what "function" means in this context but it does appear that "current cost" is the present purchase price of minis (\$2.00) and "replacement cost" is the present purchase price of maxis (\$1.25). That is, current cost is S_xUP . Therefore, the correct report is a \$40 loss.

This would clear it up were it not for the lack of explanation as to the reason for the distinction. It appears to be purely definitional: the "current cost income" is a \$40 loss and the "replacement cost income" is a \$55.84 profit and there is nothing to distinguish them except the words. Mr. Walters evidently shares my confusion (FAS 33, p. 28 emphasis supplied): "In most cases, it [current cost or distributable income] is a result of subtracting the estimated cost of the *next purchase* from the revenue of the last sale." This supports reporting a \$55.84 profit by subtracting the cost of maxis from the revenues of minis. That is, S_nUP is the correct measure. As a member of the Board Mr. Walters was a party to the deliberations and therefore it seems likely that if the question had been raised, he would know the answer given by the proponents even though he disagreed. My conjecture is that the question was never answered because it was never raised.

Thus, FAS 33 either answers the question by definition or it fails to answer the question. If the former, it merely rephrases the question: should we account for current cost (S_xUP) or replacement cost (S_nUP)? If the latter, we return directly to the original question of S_xUP versus S_nUP . Was the "current income from continuing operations" a \$40 loss or a \$55.84 profit? Should the firm pay its "distributable income" of \$55-84 in dividends or should it seek additional financing of \$40 to restore its physical capital position which was diminished by a \$40 loss? Perhaps the proponents can answer, I cannot. (7)

Extension of the time period reveals that both S_nUP and S_xUP result in conceptual as well as practical problems. If we choose S_nUP we must apply it consistently in February in order to achieve comparable figures. The conceptual problem is apparent: maxis are being purchased and sold in February and therefore the presumed objective is to *maintain* the physical capital of maxis but we are *measuring* the physical capital of minis. Of what use to either managers or owners is information about minis when the firm is dealing in maxis? The practical problem is also apparent: since minis are out of style, they are no longer being manufactured in February and therefore we cannot determine their current cost. When there is no market for minis the amount of current cost is impossible to determine. It would be difficult, albeit possible, to determine their reproduction cost but one wonders whether this would be cost beneficial especially in view of the conceptual problems. Both the conceptual and practical problems are highlighted by further extensions of the time period. Not only could we consider such problems in March when midis will be in style, we could also assume that Macys adopted physical capacity measures in 1880 when bustles were in style and confound ourselves with the 1980 conceptual and practical problems of measuring minis, maxis and midis on the basis of bustles.

The problems of S_xUP are parallel. In order to achieve comparability we must restate the December figures on the basis of maxis. But the firm was dealing in hot pants in December and this raises the conceptual problem of usefulness as well as the practical problem of determining the cost of maxis before they were being manufactured and sold. For the same consistency-comparability reason, we would need to restate the past figures, going back at least five years if not all the way back to bustles, on the basis of minis in January, maxis in February, midis in March and so forth every time the style changed. Not only would frequent restatements be confusing, they would also be very costly and the benefits would be minimal.

Given these considerations we must reject both S_nUP and S_xUP . A third approach is to define a more

abstract unit. The argument is:

(3) The firm is actually replacing skirts with skirts and therefore the measurement should be based on skirts. On this basis a \$35 profit would be reported. The \$160 cash will purchase 128 skirts (maxis) at \$1.25 each February 1; the \$100 cash will purchase 100 skirts (minis) at \$1.00 each on January 1; the increase in the ability to purchase skirts in 28 which at \$1.25 each is a \$35 profit.

This measures S_sUP (for skirts) as opposed to the rejected S_xUP and S_nUP . The criterion of truth is met since S_sUP conforms to empirically testable facts.

In essence, S_sUP is an application of the solution to the well-known problem of adding (or subtracting) apples and oranges. The proposed solution is to call the sum (or difference) units of "fruit" instead of "apples" and "oranges." Here we call the difference "skirts" instead of "minis" and "maxis." If one had 128 apples on February 1 and 100 oranges on January 1, it is reasonable to say that one is better off by 28 pieces of fruit just as it is reasonable to say that one is better off by 28 skirts.

Extension of this approach to more dissimilar units, however, yields absurd results. For example, it would be absurd to say that if one had 2 pineapples on February 1 and 100 grapes on January 1, then one is worse off by 98 pieces of fruit. The reason we consider the result to be absurd is that the pineapples and grapes are not sufficiently similar to permit us to ignore the difference in, say, food value. To put it positively, the reason we consider the difference between apples and oranges to be reasonable is that, at least implicitly, we *equate* one apple to one orange in some sense such as food value. Since we are not willing to equate one pineapple to one grape, we consider sums and differences of pineapples and grapes to be absurd.

The same applies to measuring the profit of Macys. It is reasonable to say that the firm is better off by 28 skirts only if we are willing to equate, in some sense, minis to maxis. The question is: in *what* sense is one mini equal to one maxi? The fact that both are skirts does not answer the question unless we are willing to ignore differences in workmanship, design, quantity of material, kind of material, and so forth. A cotton mini is not equal to a wool maxi in several senses not the least of which is market value.

To make the point consider the extreme example of Macys deciding to compete with Neiman-Marcus by replacing its cotton mini skirts with ermine maxi skirts at a cost of \$80 each. The \$160 cash will purchase 2 ermine maxis at \$80 each on February 1; the \$100 cash will purchase 100 minis at \$1.00 each on January 1; the decrease in the ability to purchase skirts is 98 which at \$80 each is a \$7,840 loss. The consequent is absurd. Just as we cannot equate pineapples to grapes because of differences in food value we cannot equate cotton to ermine because of differences in market value.

Once again we have come full circle to the fundamental question: what attribute should we account for? To be able to equate different units requires that we measure the same attribute in both to see whether they are equal in regard to that attribute. The unanswered question is: what attribute should we measure to determine that equality? I confess that I do not know the answer if value measures are excluded. I fear that physical capital proponents also do not know the answer. Worse, I fear that they do not know the question. Instead of addressing the question it seems that they assume, often tacitly, that the firm replaces with identical units. (8)

In summary, adopting SUP instead of NOD does not resolve the question. If we decide to account for specific units, we must decide which specific units we should account for. If we assume replacement with identical units no decision is required but if we make the more realistic assumption of, at least eventually, replacing with different units, we must choose the unit that we use as the numeraire. This simple case reveals three plausible choices -- minis, maxis and skirts -- with no apparent reason for preferring any one over the others. Extension of the time period or extension to more dissimilar units

reveals that all three result in such severe conceptual and practical problems that all three must be rejected.

Therefore, I conclude that physical capital measures are not applicable to firms that replace different units. This excludes a large number of firms. Car dealers replenish their inventory of luxury cars with compact cars and appliance dealers replenish their inventory of black and white televisions with color televisions. Toy dealers purchase and sell hula hoops one year, while they purchase and sell skateboards the next year. Last year's propellers are this year's jet fans in firms that sell airplane parts, and last year's slide rules are this year's hand-held electronic calculators in firms that sell office and engineering supplies. Last week's fresh strawberries are this week's fresh cherries at the grocery. And so on for a great number of firms. In time all firms must either adapt to changing tastes and changing technology by replacing with different units or fail to adapt and die. Thus, physical capital measures eventually become inapplicable to all living firms, to all going concerns.

Decreasing Costs. Arguments for measuring physical capital are almost invariably couched in terms of increasing current costs. In times of inflation it is rather natural to think about increasing prices. Even in times of inflation, however, some prices decrease. Dealers in electronic calculators provide a ready example since their prices have decreased dramatically in the recent past.

Let us consider the case. Assume that Radio Shack purchased 100 calculators at \$1.00 each on January 2 and the current cost is \$0.50 each on January 31. According to Propositions 1 and 2 we need to make the following entry:

Shareholders' Equity	\$50
Inventory	\$50

The arguments are the same: (1) the inventory account now reflects the current cost of the units; and (2) the adjustment is to equity, not income since the 100 units has remained constant and the only thing that has changed is the incidental dollar expression of these units. Upon sale of the units the entry is:

Cost of Goods Sold	\$50
Inventory	\$50

This is in compliance with Proposition 3 that the income is the change in physical capital and this is determined by deducting the current costs from revenues.

The pricing policy arguments are also applicable. Radio Shack can place itself in the same physical capital position by basing its markup on the current cost. That is, if the current cost had remained constant, it would have earned \$60 on a 60% markup which would have allowed it to pay the equivalent of 60 units in dividends after provision for replacing the 100 units. Basing the markup on current costs the firm will earn \$30 which will allow it to pay the equivalent of 60 units (-\$30/\$0.50) in dividends after provision for replacing the 100 units. Of course, Radio Shack would prefer to sell the units at \$1.60 each instead of \$0.80 each but its competitors who have purchased later at the decreased current cost will set their prices at \$0.80 and therefore it will be forced to sell at \$0.80 in order to meet the competition.

Exhibit VI displays these figures.

Exhibit VI
Measuring SUP in Dollars

Merchandising Firm
Combined Financial Statements

	Jan 1	Month of Jan	Feb 1
Cash	\$50		\$50
Shareholders' Equity	\$50		\$50
Beginning Retained Earnings	-0-		-0-
Sales		\$80	
Cost of Goods Sold		50	
Net Income		30	
Less Dividends		30	
Change in Retained Earnings	-0-		-0-
Ending Retained Earnings	-0-		-0-
Total Equity	\$50		\$50

When the dollar figures in Exhibit VI are divided by the current cost of \$0.50 the quotients will reveal that the firm started with 100 units and ended with the ability to replace 100 units and therefore physical capital has been maintained. The income statement figures are the same as they would have been if current cost had been constant -- their equivalent units are exactly the same as those in Exhibit V. Thus, in regard to SUP, the firm is the same in all respects.

But something is not quite right. The firm purchased units for \$100, sold them for \$80 and yet it reported a \$30 profit. That is a very curious statement. The reason it is curious is that the well-offness of the firm and the owners have diverged. In the increasing cost case the firm was equally as much better-off, having earned the same SUP profit in units, and the owners were more better-off having increased their dividends. In this decreasing cost case the firm is equally as much better-off, having earned the same SUP profit in units, but the owners are worse off, having suffered a decrease in dividends. The owners' ability to purchase consumer goods has been halved -- dividends decreased from \$60 to \$30 -- and they would find small comfort in the fact that their ability to purchase calculators has been maintained. That \$30 will purchase the same number of calculators now as \$60 would have purchased before is irrelevant to the owners. From the owners' point of view, there has been a \$20 loss -- a decline from \$100 to \$80 -- not a \$30 profit. Therefore, owners would object to receiving a distribution of profit, a dividend, when, from their point of view, there was no profit to distribute.

The halving of dividends and the \$20 loss is likely to incur the wrath of owners. But when assessing management they will be forced to give them good marks because the managers have achieved the objective of maintaining physical capital. Note the contradiction of the owners being unhappy with the results of management's actions and yet being required to conclude that they have been good stewards since their only controllable variable is the number of physical units and since they have achieved the objective of ending with the same number as they started with.

Even the managers are unhappy with themselves since they have not achieved the minimum objective of maintaining share prices. (See point (2) p. 000 supra.) Since the share price is the discounted value of the dividend, the halving of the dividend results in the halving of the share price. In order to maintain the same dividend and the same share prices managers should *double* the physical capital, *not maintain* it. But the need to double physical capital means that the SUP profit must be retained and therefore SUP profit is *not* distributable income. The owners must invest an additional \$20 to permit the doubling of physical capital as well as foregoing the dividends. That required investment is an alternative

explanation of the reason that the owners think that the firm has suffered a \$20 loss instead of earning a \$30 profit.

The cruelest blow comes when we find that our efforts to convince the IRS to base the income tax on SUP profits have been successful and therefore they levy a 50% tax on the \$30 profit. This requires the owners to invest \$45 in order to maintain share prices and dividends and therefore causes them to complain that the tax is confiscatory, i.e., a tax on capital, not income.

The world has gone haywire. All of those wonderful advantages of SUP measures are now catastrophes. And the only thing that has changed is the direction of the price movements. All of the other facts and assumptions in this decreasing cost case are exactly the same as in the increasing cost case. (9) The basic problem is that SUP measures of units do not coincide with SUP measures of dollars. When prices are increasing the physical capital measures enhance the owners' well-offness since SUP profits in units remain constant but SUP profits in dollars increase which permits a dividend increase. When prices are declining the opposite happens -- SUP profits in units remain constant but SUP profits in dollars decrease which requires a dividend decrease.

The magnitude of the divergence increases as the price declines. Consider the extreme case of zero current cost. Although rare, there are actual cases of zero prices. Recall the sharp decline in prices of hula hoops after that fad had peaked. At the end of that fad hula hoops could not be sold at a positive price -- they were free -- and therefore wholesalers offered them to retailers at a zero current cost. Consider a retailer who held an inventory of hula hoops at the time the current cost went to zero. Since the retailer had previously paid for the inventory and since it cannot sell that inventory, a monetary measure would show a loss equal to the historical cost of the inventory. But a physical measure will not show a loss since the number of units has not changed. On the contrary, it will show a SUP profit in units since it can now acquire, say, 1,000,000 additional units -- its specific units purchasable has increased since it requires no dollars to purchase at a zero price. Thus, with no further action, by the sole fact that current cost has gone to zero, the retailer would report a SUP profit of 1,000,000 units. The SUP profit in dollars is zero since the multiplicand of the units is zero. The adjustment of the asset to current cost with the offset taken to shareholders' equity means that the firm started with zero dollar capital and ended with zero dollar capital, hence a zero loss.

Such a report is not merely curious, it is absurd. If prices are truly of no consequence, if physical units are the only thing of interest, then we must allow any firm that traffics, in free goods to report an infinite SUP profit in units and a zero SUP loss in dollars. The reason such reports are absurd is that the owners invested dollars with the expectation of receiving a dollar return in dividends. They are worse off, having lost their original dollar investment and having no prospect of receiving dollar dividends. Therefore, the owners would certainly consider such reports to be absurd.

In summary, when prices are declining SUP measures are, at worst, contradictory in that they permit the firm to show a profit when the owners have suffered a loss and, at best, asymmetrical in that all the advantages when prices increase are disadvantages when prices decrease. The reason for adopting SUP measures was to avoid the evils of NOD profits when prices are increasing but SUP profits produce equally as many evils when prices are decreasing. Therefore, we must reject SUP measures when prices are decreasing for the same reasons that we reject NOD measures when prices are increasing.

I therefore conclude that SUP measures are not applicable when prices decline. This excludes a fair number of firms. In the recent past we have experienced substantial, albeit short-term, price decreases (or "rebates") in television sets, automobiles, beef, poultry, airframes, electronics and so forth. Even if inflation continues we can expect price declines in other goods from time to time. For this reason we can expect SUP measures to eventually become inapplicable to most firms.

Different Firms. Arguments for current costing are invariably couched in terms of merchandising or manufacturing firms. The thing that characterizes such firms is that they operate in two markets: the

market in which they purchase is different from the market in which they sell. For example, a retailer purchases in the wholesale market and sells in the retail market. There is another class of firms, called "trading firms," that purchase and sell in the same market.

Consider a trading firm, e.g., a mutual fund, that purchased 100 shares of General Motors on January 1 for \$1.00 per share and sold them on February 1 for \$1.60 per share. This firm will report a zero SUP profit for the month. To put it in terms of the balance sheet, the firm started with \$100 which would purchase 100 shares and it ended with \$160 which will purchase 100 shares. Thus, it is equally as well off in physical capital since 100 shares is equal to 100 shares. To put it in income statement terms, the revenues are \$160 and the current cost of goods sold is \$160 and the difference is zero.

Now compare this firm to another one that purchased 100 shares of General Electric on January 1 for \$1.00 per share and sold them on February 1 for \$0.75 per share. For the same reasons as given above, the firm will report a zero SUP profit for the month. Thus, the same SUP profit will be reported for both firms despite the fact that one had a price increase and the other a price decrease. The same holds for the gold speculator who bought for \$35 and sold for \$700 per ounce and for the silver speculator who bought for \$50 and sold for \$10 per ounce. Both will report a zero SUP profit.

In general, *any* firm that buys and sells in the same market will *always* report a zero SUP profit for the obvious reason that the selling price always equals the current cost of the identical units. (10) The consequent of a zero profit for *all trading firms*, for *all time periods* for *all price changes* is absurd. There is no point in measuring profits if one knows a priori that its magnitude will always be zero. There is no point in reporting profits if the receivers know beforehand that the reported amount will always be zero. (11)

For these reasons we must conclude that SUP measures are not applicable to trading firms. This excludes a large number of firms and an even larger segment of the economy. The most apparent exclusions are those firms whose major assets are marketable securities. There are a large number of financial institutions who would thus be excluded. In addition, SUP measures would not be applicable to the marketable securities held by merchandising or manufacturing firms. Thus, there would be inconsistencies in the method of accounting for different assets in such firms. All commodity traders -- wheat, soybeans, oil, copper, etc. -- would also be excluded, as well as all real estate traders.

Summary. The measurement of physical capital has severely limited applicability. The measure is applicable only when prices are increasing, the firm replaces identical units, and the firm buys in one market and sells in another market. If the firm buys and sells in the same market, the measure yields the absurd result of zero profits for all firms. If the firm replaces with different units, serious conceptual and practical problems arise. If the prices are decreasing, the measure results in reporting a profit for the firm when the owners have suffered a loss. Therefore, measuring physical capital is a special case that cannot be generally applied to the measurement of wealth and income.

Firms vs. Owners

The previous discussion of *what* attribute we should account for raises the fundamental of *who* we should account for: should we account for the firm or the owners of the firm? This choice is sometimes phrased as the entity versus the proprietorship concept. (12) It can be more simply and starkly phrased as: whose income and wealth should we measure?

The concepts of income and wealth must refer to something quite specific. This is indicated in ordinary language when we speak of the wealth and income *of* the nation or the wealth and income *of* General Motors or the wealth and income of Sterling. Obviously, we cannot speak meaningfully of wealth and income unless we have a specific object for the preposition *of*. Until we supply the object for that preposition, we cannot begin to measure wealth and income. The choice revealed here is the firm versus the owner.

The firm, at least in its corporate form, is known to be a fictitious person. We can postulate that this fictitious person's maximand is physical capital. Since this fictitious person is not a consumer, we can conclude that ability to command consumer goods is irrelevant. Since it does not consume the goods that it deals in, it has no declining marginal utility for those goods. Its utility is a linear function of the quantity of goods. The prices of those goods are not pertinent except insofar as the purchase prices affect the quantity that it can command when it holds cash. It is indifferent to price changes of goods that it holds in inventory since those changes do not affect the quantity. Its pertinent price index is the price relative of the good that it deals in since it is only interested in its ability to command that particular good.

By contrast, the owner is a real person, a consumer. For any particular good, the marginal utility declines with the quantity owned. The owner qua consumer will get less satisfaction from owning the second calculator than he gets from owning the first; the hundredth calculator will provide minimal marginal utility. Thus, the owner qua consumer would be quite happy to exchange the hundredth calculator for a pound of meat. The consumer prefers a variety of goods. The way to obtain a variety of goods in a market economy is via exchange. The medium of exchange is money, and the ratio of exchange is price. Thus, prices and price changes are of utmost importance to owners.

Just as the firm is indifferent to price changes (under the assumed maximand), the owner is indifferent to quantity changes given constant value. It makes no difference to the owner whether the firm owns 100 units that can be sold for \$1.00 each or 2 units that can be sold for \$50.00 each since both yield \$100. The value is equal, the command over the variety of other goods is equal, and therefore the owner is indifferent to the quantities.

If the owner qua consumer owns a good and its selling price goes up relative to the purchase prices of other goods, the owner is better off because he can command a greater quantity of *other* goods, and vice versa if the selling price of an owned good declines. By extension, if the firm owns goods and the owner owns the firm, then the owner is better off when the selling prices go up relative to the purchase prices and is worse off when the selling prices go down. It matters not to the owner whether the firm can replace the same quantity as long as the value is maintained. Thus, the owner prefers a monetary measure of the firm to a physical measure of the firm because the monetary measure better reflects his ability to command a variety of goods. Of course, if the price *level*, as opposed to the *specific* price, changes, then we need to adjust the monetary measure to more accurately reflect the changes in his ability to command the variety of goods. But since it is a variety of goods that is of interest, it is clear that the pertinent index is not the price relative of the assets owned by the firm but rather a general index that reflects the owner's normal purchases, e.g., the Consumer Price Index.

In other works I have argued that we ought to account for owners' wealth and income. For this reason, among other reasons, I concluded that the attribute that we should measure is Command Over Goods (COG) as opposed to SUP, NOD and other alternatives. I mean by COG that assets be stated at their exit values (immediate selling prices) and adjusted by the Consumer Price Index. Since the interested reader can pursue those arguments elsewhere,⁽¹³⁾ I will not repeat them here. In addition, the arguments for COG go beyond the objective of this article. My primary objective here is to try to clearly reveal that the fundamental question of what attribute we should account for involves the equally fundamental question of who we should account for. My secondary objective is that casting the choices in stark relief will allow us to clearly see that although it is possible to account for fictitious persons with assumed maximands of physical units, the result of such an accounting so diverges from accounting for real persons that real persons consider such results to be absurd. Certainly no real person would ever agree that beginning with \$100 cash and ending with \$80 cash results in a \$30 profit. Since we do in fact account for real persons, I conclude that we should reject the physical capital concept and return to the financial capital concept. (See FASB Exposure Draft, 59 for the same conclusion for similar reasons.)

Summary

The charge that historical cost accounting produces false profits has been with us for a very long time. The charge has merit in the sense that it can be demonstrated that in times of increasing prices if historical cost income is paid in dividends the firm cannot replace an equal number of physical units absent additional financing. The proposed remedy is to account for physical units, to adopt maintenance of physical capital as the basis for measures of wealth and income. Such physical measures are said to produce true profits.

Examination reveals that the proposal is to measure a different attribute, not that one is false and the other true. Just as the measures of the different attributes of length and weight can both be true, the measures of the different attributes of NOD and SUP can both be true. Therefore the criterion of truth will not permit a choice.

An appealing argument can be made for physical measures. It appears that it solves all, or almost all, of the problems which vex accounting. However, the apparent solutions will not tolerate careful examination. The proffered solution to the problem of measuring value is to avoid the problem by measuring physical units. But this solution is applicable only when the units are identical. When units are different, as will be the case in the majority of instances in the long run, measurement of physical units is at least equally as difficult as measuring value. Thus, the proffered solution to the measurement problem is the substitution of one set of unsolved problems for another set of equally difficult unsolved problems. The proffered solution for accounting for merchandising and manufacturing firms results in reporting zero profits for all trading firms for all time periods for all price changes, which consequent is absurd. Thus, the solution to accounting for firms of one type causes equally difficult problems in accounting for firms of another type. The proffered solution to the problem of accounting for increasing prices results in contradictory measures -- reporting a profit for the firm and a loss for the owners -- when accounting for decreasing prices. The advantages of SUP measures when prices are increasing become disadvantages when prices are decreasing. The evils of SUP measures when prices are decreasing are equally as bad as the evils of NOD measures when prices are increasing.

The consideration of trading firms and decreasing prices in merchandising and manufacturing firms reveals that the choice of the attribute to be accounted for involves the choice of accounting for the firm versus the owners. Since the firm is a fictitious person, it may be acceptable to measure physical units when accounting for firms. Such accounting effectively disregards prices and thereby reports a constant zero profit for trading firms regardless of price movements and a positive profit for merchandising and manufacturing firms that increase physical units regardless of price decreases for those units. However, owners are real persons to whom prices are of utmost importance and therefore price changes cannot be disregarded. Owners of trading firms enjoy a profit or suffer a loss when prices change and owners of merchandising and manufacturing firms suffer a loss when selling prices are less than original purchase prices. Such profits and losses are measures of value changes which effectively disregard physical units. The alternatives are to account for firms or owners and the choice that we make dictates whether we choose a physical or value attribute. I choose owners and values.

Conclusion

And many false prophets shall rise, and shall deceive many. -- Matthew 24:11

Physical capital proponents have correctly identified serious deficiencies in historical cost accounting. We are indebted to them for pointing out those deficiencies in particular and for helping us to peer through the monetary veil in general. However, they have not identified the correct remedy for the deficiencies. Their proffered solution is intuitively appealing and has attracted many disciples but they have been deceived by a superficial analysis. Further analysis reveals that physical capital fails when its tacit assumptions are violated and that those assumptions will in fact be violated. Therefore at the present time the need to beware the false prophets of physical capital is equally as pressing as the need

to beware the false profits of historical cost.

FOOTNOTES

(1) FAS 33, in fact, compromised the two positions. In brief, it changed the name of "holding gains" to "increase in current cost" (135) and then employed the financial capital concept by *placing* it on the income statement but employed the physical capital concept by *not adding* it to income (70). The idea is to allow users to decide whether or not it should be an *addend* in the calculation of income. Both dissenters point to the proliferation of income numbers which reflects "the range of views [of] respondents" (p. 25) and "offers a smorgasbord of data [which has] something for everybody" (p. 28). This outcome confirms my long held view that FASB is a legislative body and that the function of a legislature is to record the compromises that it can effect among its constituencies. It also confirms my view that such compromises do not achieve their intended objective: instead of reaching a middle ground that satisfies everyone, it reaches a muddle that dissatisfies everyone. I fear that this describes the compromise adopted in FAS 33: even though it reflects the range of views of all respondents, it dissatisfies all respondents.

The process of reaching a compromise resembles "the prisoners' dilemma" which has caused my captive students to dub it "Sterling's prisoners' dilemma." It goes like this: No group is fully satisfied unless its position is adopted; each group is highly dissatisfied if an opposing position is adopted; FASB records a compromise; ergo no group is fully satisfied; ergo all groups are dissatisfied. The point is that compromising is not a process of achieving satisfaction, it is a process of lessening the level of dissatisfaction. Perhaps this explains why everyone, even supporters of FASB, are critical of FASB. An alternative to compromise is to adopt one of the opposing positions, to "exercise strong leadership," which fully satisfies the proponents of that position but which fully dissatisfies the proponents of opposing positions. It makes strong allies and dedicated enemies. This strategy requires sufficient power to enforce the adopted position as well as sufficient power to gain immunity from retaliation by the constituencies either at the ballot box or in the pocket book. FASB has not been granted that power and therefore it must compromise and suffer criticism from all.

Accountants at some times are masters of their fates: The fault, dear colleague, is not in our FASB, but in ourselves, *we* are the constituents.

(2) For inventory the proposal was to define the index, I , as p_1/p_0 where p_0 is the purchase price at date of purchase (i.e., historical cost) and p_1 is the purchase price at date of sale (i.e., current cost) and then "price level adjust" the historical cost figures by multiplying by I . Obviously $I p_0 = (p_1/p_0) p_0 = p_1$. Thus, this kind of price level adjustment is merely current costing by another name.

(3) Those who object to specific units *purchasable* because it refers to "hypothetical, not actual, transactions" can achieve the same results by shifting the accounting period ahead by one day and having the firm repurchase the units on February 2. This allows one to interpret SUP as specific units *purchased* instead of *purchasable*. SUP Financial Statements from January 2 to February 2 will contain exactly the same figures as those in Exhibit II.

Many accountants criticize physical capital and other proposals on grounds that hypothetical transactions are ipso facto illegitimate or false and therefore should not be reported; others on grounds that it is impossible to measure things that didn't actually happen. A moment's reflection will reveal the error: scientists often measure the potential instead of the actual. There is a whole class of scientific concepts, called "dispositional terms," that end in "ble" such as flexible, soluble and flammable. If we prohibit such concepts in science, then we will artificially deprive ourselves of an enormous number of useful scientific measurements. For example, we won't be able to say "there are x Btus in that coal pile" both because it is potential, not actual, energy and because it is *flammable* or *burnable*, not burned. For the same reason that we shouldn't prohibit such concepts in science, we shouldn't prohibit them in accounting. Thus, *purchasable* is both legitimate and measurable and therefore shouldn't be prohibited on those grounds.

(4) If there is an objection to adjusting the January I cash from \$100 to \$125 one can shift the accounting period forward by one day and adjust the January 2 inventory from \$100 to \$125. Some prepublication readers objected to adjusting cash but did not object to adjusting inventory. I do not understand the distinction: to my mind there is no difference between writing up cash to more than was actually in the till and writing up inventory to more than it actually cost especially when that cash is used to purchase and to measure the cost of the inventory.

(5) Physical capital proponents assume, either implicitly or explicitly, that the firms can be competitive under these conditions. Specifically, the assumptions are: (1) the same number of units will be sold at the new selling price as at the old selling price; (2) the new selling price is based on the application of a constant markup rate to the current cost. Revsine (p. 71n) is one of the few who explicitly recognizes the necessity of the assumptions: "(1) operating levels are unchanged, and (2) input costs and output prices move in parallel fashion." (See also p. 153 et passim for a repetition of the same points in different words.) In order to be consistent with the proponents I am making the same assumptions throughout this article even though I think they are likely to be violated more often than they are met.

(6) They are particularly enthusiastic in price regulated industries such as public utilities. The managers and owners of such industries want to write up the assets to current cost because the public utility commissions allow them to earn a "fair rate of return" and the application of that rate to an increased asset base permits higher selling prices. Since the write up is taken to equity instead of income, the same result is achieved if the public utility commission figures the return on equity rather than on assets. Since the expenses deducted are the higher current costs, the increased revenues from the increased selling prices do not result in increased reported profits. They can still report an acceptable profit to the public and the public utility commissions. In addition, they and other non-regulated firms hope to eventually convince taxing authorities to levy the income tax (but not the property tax) on the basis of current costs.

This would make almost everybody happy. Managers would be happy because they could increase their reported assets without an accompanying sacrifice and they could increase their selling prices and revenues. Owners would be happy because they could increase their reported equity without an accompanying reported or taxed profit and they could increase their dividends. Both managers and owners would be happy with the prospect of paying lower income taxes. Accounting practitioners would be happy because they have pleased their clients. Accounting academicians would be happy because of the rarely received support of owners, managers, and practitioners for their theoretical proposals. Perhaps consumers and other taxpayers would not be happy with this system, but then you cannot please everyone.

(7) A third possible interpretation of FAS 33 would result in reporting a zero current cost income. The board (¶126) decided to use "current cost or lower recoverable amount" when replacement is not "worthwhile" which is defined as when "recoverable amounts [selling price for inventories] are lower than current costs." Applying the illustration presented and the example discussed to the mini-maxi case yields the following income statement:

Sales revenue	\$160
Cost of Goods Sold	160
Income from continuing operations	-0-
Cost at date of sale	\$200
Cost at date of acquisition	\$100
Increase in current cost	\$100

I am not sure that the illustration applies to the mini-maxi case but if it does the confusion is compounded. The above cannot be interpreted as SUP even though the objective is to measure SUP. The reader is invited to try to cast the above in the form of Exhibits III and IV. To put the problem in

more familiar terms, the books do not balance. The debit to inventory (or cost of goods sold) necessary to reflect the recoverable amount" is \$60 while the credit to shareholders' equity necessary to reflect the "increase in current cost" is \$100. The debits do not equal the credits: the February 1 balance sheet shows total assets of \$160 and total equities of \$200. The limited objective of this article as well as limited space prohibits me from exploring the perceived ambiguities of this application despite my itch to do so. Since I cannot see how this application measures SUP, it is irrelevant to the main thrust of this article.

(8) There is another dimension to the problem of identical units. The above discussion was concerned exclusively with making comparisons over time within the same firm. We also need to make comparisons among firms at a point in time. We would like to be able to compare the assets and income of Macys to those of Gimbels. If Macys used S_x UP and Gimbels uses S_n UP, it prohibits such comparisons for the same reasons that switching from S_x UP and S_n UP within Macys prohibits comparisons over time. It would be very difficult to formulate a standard which would require Macys and Gimbels to use the same unit because of differences in the timing of purchases and sales. Extension to firms in different industries compounds the problem. How do we compare Macys' assets to U.S. Steel's assets when the units are so different? I mention this problem in a footnote because it seems to me that the objective of physical capital proponents is to account for each firm individually without regard to comparisons to other firms. Since I do not think that they can achieve their chosen objective when they encounter different units over time, I have not delved into the problem of different units among firms.

(9) The critical assumptions are those mentioned in footnote 5 supra, namely: (1) the same number of units will be sold at the new selling price as at the old; (2) the same markup rate is applied to the current cost as was applied to historical cost.

(10) To be slightly more technical, a price greater than zero will always result in reporting a zero SUP profit. A zero price will allow the firm to increase its physical capital and hence report a positive SUP profit in units. A second technical assumption is that the firm does not hold cash. If cash is held and prices increase (decrease) SUP measures could show a loss (profit) because the units purchasable from the cash balance decrease (increase). (For further discussion of this point see Sterling, *Enterprise Income*, pp. 199-222.) This profit or loss only arises when a balance sheet approach is taken in the determination of income. The procedure of taking holding gains to equity does not show the SUP profit or loss from holding cash. A third technical assumption is zero transaction costs. If such costs were taken into account all such firms would always report a loss equal to the transaction costs.

(11) Prepublication readers were of the view that a zero profit for all trading firms was so obviously absurd that I should omit this section. They implied that the fault was in my interpretation of physical capital rather than a logical consequence of physical capital. Perhaps my interpretation is faulty but a reexamination failed to reveal the flaw. On the contrary, the reexamination provided some evidence that reporting a zero profit for one market operations is precisely what physical capital proponents propose. Note that merchandising and manufacturing firms operate in two markets for their inventory, but they buy and sell plant and equipment in the same market. Thus, the treatment of plant and equipment is an instance of a one market operation. Some physical capital proponents are quite explicit in their view that sales of plant and equipment do not result in a profit or loss:

During the year, plant and equipment having a net book value in the historical cost financial statements of \$1,200,000 was sold for \$2,000,000. The sale proceeds are assumed to provide an appropriate measure of the current cost of the assets at the date of sale. The \$800,000 gain on disposal reflected in the historical cost income statement represents the realization of an increase in the current cost of a productive asset and is eliminated from current cost income of the enterprise. The amount of the increase in current cost is disclosed as part of the change in the amount required to maintain the operating capability of the enterprise. (CICA Exposure Draft D. 13)

Thus, if one purchases plant and equipment for \$x and then sells it for \$y, the procedure is to consider \$y to be the current cost and then deduct the current cost from the sale proceeds, i.e., deduct \$y from \$y which yields zero in *all* cases. If \$y-\$x or if \$y -\$x there is a zero profit because is not germane to SUP. Since it presented a compromise, FAS 33 is less explicit but it seems clear that those members of the Board who are physical capital proponents would agree with the Canadian position of reporting zero profits for all sales of plant and equipment. (See, e.g., FAS 33 ¶55, 124 - 130.)

The reasoning for plant and equipment in the quotation is the same as that used in the text for marketable securities and commodities. If readers find zero reported profits for one market operations to be absurd, perhaps the fault lies in the concept of maintaining physical capital.

(12) See Lee for an insightful discussion of how neglecting this choice has confused the U.K. standard setting process. I suspect that an examination of the U.S. standard setting process would reveal a similar neglect and that much of our difficulties could be traced to that neglect. As Lee points out, the different concepts lead to different standards and therefore vacillation in the choice of concepts leads to vacillation in standards and confusion of the concepts leads to confused standards.

(13) See *Toward a Science of Accounting and Theory of the Measurement of Enterprise Income* for detailed analyses or "Relevant Financial Reporting in an Age of Price Changes" and "Decision Oriented Financial Accounting" for overviews.

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