The Impact of Current Cost Information on Investment Decisions: An Empirical Assessment

FARA ELIKAI*
SHANE MORIARITY**
FRANCES L. AYRES***

Considerable attention has been paid in the accounting literature to the relative merits of reporting current cost net income as compared to historical cost net income. A large number of surveys have found that users want current value information and believe it to be useful (Casey and Sandretto [3], Estes [4], and Louis Harris [6]). In addition, accounting scholars have argued for decades that current value information is useful for decision making. For example, Sterling [16], in a wheat-trading environment, argued that current values are needed for decisions.

Although the demand for current value information seems clear, it is not clear that formal financial statements based on current values are any more useful than historical-cost-based financial statements. Most empirical studies of the information content of current cost disclosures have reported that after controlling for historical cost earnings, current cost disclosures are not relevant.[1] From an analytic perspective, Ijiri and Noel [8] argue that because current costs are subject to higher variability than historical costs, a current cost income measure is less reliable than a historical cost income measure. As a result, they conclude that current cost income may be less useful for decision making than historical cost income.

To help resolve the question regarding the merits of current value financial statements we undertook a study to gather empirical evidence on the quality of decisions made under alternative reporting systems. Specifically, the study used an experimental approach to determine whether current value disclosures improved investment decisions and whether current cost

*Associate Professor of Accounting, University of North Carolina-Wilmington
**Professor of Accounting, The University of Oklahoma
***Associate Professor of Accounting, The University of Oklahoma

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1. Exceptions are Bildersee and Ronen [13] and Bublitz et al. [2]. Both of these studies reported that FAS No. 33 provided information to the market.

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income is more useful if it is dichotomized into trading (realized) and holding (unrealized) components.

The remainder of this paper is divided as follows: The following section discusses previous research on the topic. This is followed by a discussion of our experimental task and a description of the hypotheses tested. Next the results are discussed. The final section provides conclusions and identifies some limitations in the study.

1. Previous Research

Most studies of the usefulness of current cost information have used stock market reactions as an indicator of the information content of current value disclosures. Numerous studies have attempted to determine the impact on stock prices from both the replacement cost disclosures mandated by the Securities and Exchange Commission's (SEC's) Accounting Series Release No. 190 [15], and the requirements of the Financial Accounting Standards Board (FASB) Statement No. 33 [5]. However, attempts to find empirical support for the incremental value of current value information have been mixed (see, for example, Beaver, Griffin, and Landsman [1], Matolcsy [9], McDonald and Morris [10], Murdock [12], and Schaefer [14]). Although most studies report that current value disclosures do not provide incremental information over historical cost disclosures, there is some evidence that they do.

Bildersee and Ronen [13] used a different and more powerful design than prior studies and found that the mandated Statement of Financial Accounting Standards Number 33 (SFAS No. 33) disclosures were informative. Specifically, they find that security returns are positively associated with current cost productive activity growth. Further their results suggest that SFAS No. 33 disclosures provide information on real productive activity that is not available through historical cost financial statements. Bublitz et al. [2] reported that SFAS 33 data provided information in addition to historical cost in aggregate. However, they found that the coefficients associated with particular disclosures were not stable.

The information content studies for current cost disclosures suffer from several common weaknesses that make it difficult to interpret their results. These weaknesses include (1) possible measurement error in the current value disclosures as mandated by Accounting Series Release Number 190 (ASR No. 190) and FASB 33, (2) difficulty in assessing the timing of possible responses to the disclosures, (3) the possible failure of investors to use the information due to a lack of understanding of the data, and (4) the possibility that the market could make estimates of current values from other publicly available sources, thus making the disclosures redundant.

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Hence, although these studies suggest that ASR No. 190 and SFAS No. 33 did not appear to lead to improved disclosures, they do not tell us whether investors find current value information, properly specified, useful in making decisions.

Experimental studies of the impact of current value disclosures have been more limited, but they have also generally failed to support the hypothesis that current value disclosures provide useful information (see McEnroe and Nikolai [11] for a review). However, these studies typically fail to provide an objective criterion for the quality of a decision. Furthermore, they are frequently limited to the use of student subjects.

2. Experimental Design

Our experiment was designed to overcome these limitations. First, by using investment professionals as subjects, the external validity of the experiment is increased. Second, we sought a situation where a direct linkage could be observed between the operating decisions of management and the relative attractiveness of the firm as an investment. We concluded that we must use an industry in which the assets acquired have a definite, reasonably short life. In such an environment, we are able to constantly monitor the current values of assets over their entire lives. This, in turn, allows us to unambiguously define correct buy, sell, and hold decisions for the assets. One industry that meets this requirement consists of firms that trade in commodity futures contracts. These contracts have a definite life of usually one year or less. Further, detailed price information is available.

Another advantage of the commodities futures industry is that commodity futures are volatile, generating holding gains and losses over a short period of time. These lead to substantially different income figures for current value than for historical cost financial statements. Furthermore, the public availability of information on commodity futures suggests that investors believe that current value information is useful for decisions. Because our goal was to determine whether or not current value financial statements lead to improved decisions, it seemed logical to select an industry where a known demand for current value information exists.

Historical cost financial statements provide information on gains and losses only when they are realized through sale of the assets. In contrast, current value statements disclose both realized and unrealized gains and losses. Thus, the current value statements provide a more timely signal to investors about changes in the value of a firm's assets, which should allow investors to more accurately assess the relative attractiveness of the firm as an investment prospect. The research design used in this study provides a direct test of whether this is the case.

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2.1 The Instrument

We developed a set of four hypothetical firms dealing in commodity futures contracts. The firms traded an identical commodity portfolio consisting of cattle, hogs, wheat, and soybeans. These commodities were chosen because they are actively traded and data are readily available. There were 144 trading decisions for each commodity over a four-year interval. The firms always held three contracts of a commodity (either long or short), with different maturity dates. All firms were endowed with the same amount of initial capital ($55,000) and faced the same number of potential trades. The only difference between the firms was their percentage of correct buy, sell, and hold decisions. A correct decision was one leading to the highest return on a particular contract. The prices of the contracts were obtained from the Chicago Mercantile Exchange (CME) and the *Wall Street Journal*. The daily opening prices of the contracts were used in the study. The transactions were generated in conformity with CME trading regulations. That is, the assigned margin deposits were used on both the long and short positions. In the commodity market, contracts for each commodity are traded in a uniform quantity. For the commodities used in this study the contracts are for 40,000 pounds of cattle, 30,000 pounds of hogs, and 5,000 bushels each for wheat and soybeans. Each transaction in the study was for one standard unit. For example, if June cattle were selling at $0.66/lb, one contract would be 40,000 × $0.66 = $26,400. The broker's commission and the interest on the cash account were ignored because the net effect is nominal.

For each contract traded, the firms were restricted to holding one contract long or short. Trades were contemplated in the middle of each month. For each contract, we determined the correct strategy for the month. For example, if the firm held a long position in a contract, it could either continue to hold it or sell. By looking ahead at the market data we could easily determine the correct decision. The percentage of correct decisions, in turn, provides an ordering for the attractiveness of the firms as investments. Importantly, this ordering is based on operating decisions and is independent of any accounting measurements or procedures. Furthermore, although in the long run, firms with the most correct decisions will be shown to be the most profitable under any accounting method, the period-by-period variations ensure that no perfect ex ante ranking is possible.

The hypothetical firms made correct decisions an average of 85 percent, 80 percent, 75 percent, and 70 percent of the time over the four year period.[2]

2. The percentages were selected judgmentally. The goal was to have each firm be profitable, but not consistently so.

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Table 1 presents the quarter-by-quarter percentages of the correct decisions for the four firms. Then for each hypothetical firm the predetermined percentages of correct and incorrect decisions were randomly assigned to individual transactions. For each firm there were a total of 576 decisions over the four-year period (four commodities × three contracts × twelve months × four years).[3]

Using data generated from these hypothetical firms, we examined the impact of three forms of financial statements on the quality of investment decisions. Three sets of quarterly financial statements (an income statement and balance sheet prepared at month end) spanning the four years were prepared for each firm. The first set was based on historical costs, the second used current cost, but reported current cost income only in total. The third set also used current cost accounting but reported the components (unrealized holding gains [losses] and trading gains [losses]).[4]

The comparison of the three reporting modes allows us to compare the usefulness of current cost and historical cost information. In addition, we were able to examine whether the components of current cost income provided incremental information over the total. Figure 1 presents a simple numerical example contrasting the three approaches we examine.[5]

There were three different experimental packets corresponding to the three types of financial statements. Each packet contained the appropriate type of financial statement for each of the four firms. An example of one of the financial statements is given in Figure 2. In addition, the packets contained a cover letter, instructions, and a short questionnaire. The cover letter briefly commented on the objective of the project and the instructions provided a short description of the firms and the financial statements. Subjects received only one form of the financial statements (a between-subjects design). There were six questions in the questionnaire. The first question was the primary question in terms of the current study; it asked the respondents to rank the firms in order of their attractiveness as an investment. Questions 2 through 5 were the distractors that asked subjects about the usefulness of various formats for presenting financial data.

3. Although there is no assurance that, case by case, maximizing the *number* of correct decisions will maximize earnings—we expect that on average this would be the case, and the results bear this out.

4. Holding gains represent unrealized gains (losses) accruing from the beginning of the period until the end of the period for assets not sold. Trading gains (losses) represent realized profits earned from the beginning of the period until the date of sale.

5. There are two common types of current cost based financial statements advocated in the literature—exit value and replacement cost (or entry value). But for commodity contracts, replacement cost is identical to exit value. Thus, our firms' profits are determined solely by the difference between acquisition and disposal prices of contracts.

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TABLE 1

Actual Percentages of Correct Buy, Sell, and Hold

Firm One (overall correct % = 85)

	Q1	*Q2*	*Q3*	*Q4*	**Y1**	*Q1*	*Q2*	*Q3*	*Q4*	**Y2**	*Q1*	*Q2*	*Q3*	*Q4*	**Y3**	*Q1*	*Q2*	*Q3*	*Q4*	**Y4**
Sale Short	63	71	94	89	83	99	50	67	99	82	89	90	99	99	94	57	80	64	83	71
Buy Long	50	75	75	80	71	88	75	99	50	81	90	85	99	99	94	75	60	80	67	70
Hold	60	86	83	88	78	96	97	97	94	96	94	92	91	95	93	68	92	65	89	79
Total	58	81	86	86	78	94	92	94	92	93	92	89	97	97	94	67	86	67	83	76

Firm Two (overall correct % = 80)

	Q1	*Q2*	*Q3*	*Q4*	**Y1**	*Q1*	*Q2*	*Q3*	*Q4*	**Y2**	*Q1*	*Q2*	*Q3*	*Q4*	**Y3**	*Q1*	*Q2*	*Q3*	*Q4*	**Y4**
Sale Short	88	15	78	89	71	75	99	67	50	73	89	80	88	89	86	86	80	91	92	89
Buy Long	88	25	67	90	68	88	75	50	50	75	90	92	94	86	91	75	60	80	67	70
Hold	45	38	50	94	56	96	97	94	84	92	94	85	82	95	91	84	81	75	50	74
Total	64	31	69	92	64	92	94	89	81	89	92	86	89	92	90	83	78	81	67	77

Firm Three (overall correct % = 75)

	Q1	*Q2*	*Q3*	*Q4*	**Y1**	*Q1*	*Q2*	*Q3*	*Q4*	**Y2**	*Q1*	*Q2*	*Q3*	*Q4*	**Y3**	*Q1*	*Q2*	*Q3*	*Q4*	**Y4**
Sale Short	50	71	89	67	74	75	50	67	99	73	78	60	88	78	75	71	60	82	67	71
Buy Long	63	63	83	60	68	75	75	99	99	81	80	62	88	43	72	75	60	60	83	70
Hold	8	81	83	88	83	42	60	71	82	66	82	77	91	65	77	88	81	85	83	84
Total	69	75	86	75	76	78	61	72	61	68	81	67	89	64	75	83	75	81	78	79

Firm Four (overall correct % = 70)

	Q1	*Q2*	*Q3*	*Q4*	**Y1**	*Q1*	*Q2*	*Q3*	*Q4*	**Y2**	*Q1*	*Q2*	*Q3*	*Q4*	**Y3**	*Q1*	*Q2*	*Q3*	*Q4*	**Y4**
Sale Short	38	86	56	67	60	99	99	67	50	64	99	90	75	67	81	71	60	82	83	77
Buy Long	25	88	42	60	53	88	75	50	50	75	80	85	88	43	79	75	60	60	83	70
Hold	45	57	50	53	52	92	70	81	41	83	94	85	91	55	79	52	73	80	94	73
Total	39	69	50	58	54	92	72	78	42	71	89	86	86	56	79	58	69	78	89	74

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FIGURE 1

A Numerical Example Contrasting the Three Reporting Methods

Facts: A trading firm purchases asset A for $10 and asset B for $12 in period one. At the end of period one, the replacement costs of the assets are A: $15, and B: $20. During period two, asset A is sold for $18. The current value of asset B at the end of the period is $24.

	Period 1		*Period 2*	
Reporting Method	*Net Income*	*Total Assets*	*Net Income*	*Total Assets*
Historical Cost	$ 0	$22	$ 8[3]	$12
Total Current Cost	13[1]	35[2]	7[6]	24
Component Current Cost		35		24
Trading Gains	0		3[4]	
Holding Gains	13	—	4[5]	—

[1](15 + 20) − (10 + 12) = 13 total holding gain
[2]15 + 20 = 35 current replacement cost
[3]18 − 10 = 8 trading gain (historical cost)
[4]18 − 15 = 3 trading gain (current cost)
[5]24 − 20 = 4 holding gain (current cost)
[6]3 + 4 = 7 total current cost net income

2.2 Participants

The subjects for the study were 105 professionals representing public accounting, internal auditing, bank loan officers, bank investment officers, financial managers, and investment brokers located in the Southwest United States. The participants in the study all had four or more years of college education. On average, they had six years of experience and spent over 40 percent of their time reading, preparing, or evaluating financial statements.

2.3 Administration of the Experiment

Each participant was given a packet containing one of the three versions of the financial statements. The version given was randomly determined. The packets were distributed by the participant's supervisor who asked the participant to work alone. The subjects were instructed to compare the four firms in the packet by analyzing the financial data provided for each of them. They were instructed to rank the firms in descending order from the firm that they considered to represent the best alternative as an investment to that which was the least attractive. The review of the four firms and the completion of the questionnaire, on the average, took 20 minutes.

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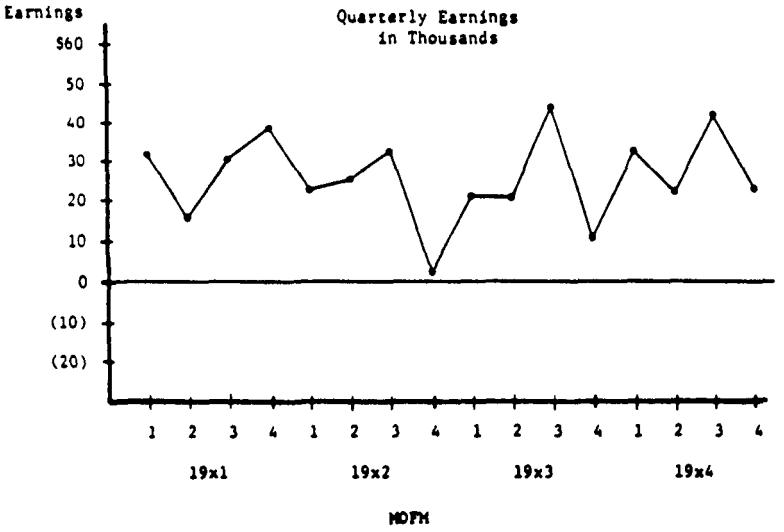
FIGURE 2

Example Financial Statement

Condensed Comparative Financial Data (Current Cost Basis)*

	Year			
	1	*2*	*3*	*4*
Investment Income (Loss)	$118,028	$ 85,966	$ 96,810	$122,175
Assets				
Cash	$ 97,615	$191,620	$296,464	$388,330
Receivables	149,420	104,888	10,320	195,740
Short-term investments	88,038	137,106	207,500	113,015
Total	$335,073	$433,614	$514,284	$697,085
Equities				
Current liabilities	$162,045	$174,620	$158,480	$219,106
Partnership equity	173,028	258,994	355,804	477,979
Total	$335,073	$433,614	$514,284	$697,085

*Assets and liabilities are carried at their current market values. The investment income recognized each period includes both realized gains and changes in the carrying value of assets.



Condensed Comparative Quarterly Earnings

Period	*First Quarter*	*Second Quarter*	*Third Quarter*	*Fourth Quarter*	*Total*
Year 1	$32,300	$16,150	$30,725	$38,853	$118,028
Year 2	23,960	25,155	33,095	3,756	85,966
Year 3	20,777	20,320	44,643	11,070	96,810
Year 4	33,345	22,480	42,870	23,480	122,175

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2.4 Hypotheses

Using data obtained from the responses to the experiment, the following hypotheses were tested (expressed in their alternative form):

H1: Users are able to rank firms more accurately when provided with total current cost (TCC) statements than when provided with historical cost (HC) statements.

H2: Users are able to rank firms more accurately when provided with component current cost (CCC) statements than when given HC statements.

H3: Users are able to rank firms more accurately when provided with CCC statements than when provided with TCC statements.

These hypotheses imply an increasing level of information provided by financial statements formed using historical cost, total current cost, and component current cost information.

3. Results and Discussion

The initial step in analyzing the data was the calculation of the percentage of correct rankings by subjects. These percentages were then compared to what would be expected by chance. Using the binomial test, z values were computed for the number of correct rankings of pairs of firms, triplets, and all four firms. The z values were obtained by using the normal approximation to the binomial distribution. The calculations were done separately for each group of subjects receiving the different types of financial statements. The expectation and variance of the number of correct ranks (R) were calculated as follows:

$$E(R) = NP,$$
$$\text{var}(R) = NPQ,$$

where

N = total number of participants for each group;
P = probability of ranking the firms correctly for pairwise triple and quadruple combinations, respectively, and
$Q = 1 - P$.

The central limit theorem was applied, which allowed the normal approximation and the transformation of the number of correct ranks (R) into the standard normal deviates using the following formula:

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$$z = \frac{R - E(R)}{\text{var}(R)}.$$

Significant positive z values indicate that subjects were able to rank the firms correctly at better than chance levels. Because larger z values result from a greater percentage of correct rankings, the z values can also be used as a measure of the degree of usefulness of the financial data under each of the alternative accounting methods.

A test for significant differences between the percent of correct rankings under CCC, TCC, and HC methods was also performed. This test utilized the z values for a two-sided test.

Positive values for z in this case indicate that a greater percentage of subjects correctly ranked the firms under the first method in each hypothesis as opposed to its competing method (TCC versus HC in H1, CCC versus HC in H2, and CCC versus TCC in H3). Values for z were again calculated for the percentage of subjects ranking pairs, triplets, and all four firms correctly.

Tables 2 and 3 summarize our findings. Table 1 presents the results of the test of actual correct rankings versus chance and indicates: (1) the number of participants under each alternative accounting method, (2) the number of correct ranks made by the participants in each category, (3) the related percentage of correct ranks, and (4) the z values with the associated probability that the percentage of correct ranks for each accounting method was attributable to chance.

The results in Table 2 indicate that all three sets of financial data were useful in helping the participants rank order the firms. The subjects in this study made their decisions based solely on the financial information provided for the firms. They did not have access to any other economic information, and yet they generally ranked the firms correctly at a much better than chance level.[6] More importantly, the subjects' performance differed by type of disclosure. A comparison of the z values among the alternative accounting methods reveals that the z values are greatest under CCC, in the middle for TCC and are the smallest for HC. That is, there is an overall pattern of improvement in rankings from HC to TCC to CCC.

Table 3 presents the results of significance tests for differences between the percentage of correct rankings for CCC and HC, CCC and TCC, and

6. If the statements were not useful, comparisons across types would be moot. Having additional nonaccounting data available would likely increase the percentage of correct rankings for all treatments and make the identification of differences across treatments more difficult to discover. One advantage of the instrument used is the ability to withhold such information thus improving the power of the experiment.

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TABLE 2

The Percentage and Related *z* Values of Subjects' Correct Rankings Under Each Alternative Method

	CCC *No. of Participants = 33*				*TCC* *No. of Participants = 38*				*HC* *No. of Participants = 34*			
	No. of Correct Ranks		*% of Correct*		*No. of Correct Ranks*		*% of Correct*		*No. of Correct Ranks*		*% of Correct*	
Ranking[1]	*Actual*	*Chance*[2]	*Ranks*	*z Value*	*Actual*	*Chance*[2]	*Ranks*	*z Value*	*Actual*	*Chance*[2]	*Ranks*	*z*
Pairwise Comparison:												
A > D	20	16.5	60.61	1.401	17	19	44.74	−0.811	13	17	38.24	−1.544
B > D	23	16.5	69.70	2.802**	21	19	55.26	0.486	14	17	41.18	−1.201
A > C	20	16.5	60.61	1.401	18	19	47.37	−0.486	13	17	38.24	−1.544
C > D	26	16.5	78.79	4.204**	24	19	63.16	1.460	16	17	47.06	−0.514
A > B	23	16.5	69.70	2.802**	17	19	44.74	−0.811	13	17	38.24	−1.544
B > C	20	16.5	60.61	1.401	24	19	63.16	1.460	13	17	38.24	−1.544
Triple[3] Comparison												
A > C > D	18	5.5	54.55	5.605**	15	6.3	39.47	3.556**	9	5.6	26.47	1.304
A > B > D	19	5.5	57.58	6.072**	15	6.3	39.47	3.556**	11	5.6	32.35	2.224*
B > C > D	19	5.5	57.58	6.072**	15	6.3	39.47	3.556**	8	5.6	23.53	0.843
A > B > C	18	5.5	54.55	5.605**	14	6.3	39.84	3.120**	10	5.6	29.41	1.764
Quadruple[3] Comparison												
A > B > C > D	17	1.3	51.52	13.175**	14	1.5	36.84	9.673**	8	1.4	23.53	5.221**

[1]A > B means A is ranked higher than B.

[2]Expected number of correct responses under chance.

[3]The *z* values for the triple and quadruple comparison are based on an expected ranking on a completely chance basis. If *z* values were computed contingent on the pairwise comparisons obtained the results would be lower.

*significant at $\alpha = .05$ or less ϕ 2.

**significant at $\alpha = .01$ or less ϕ 2.5.

The normative (correct) ranking is A > B > C > D.

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TABLE 3

The Results of the Binomial Test for the Comparison of the Alternative Accounting Methods

Ranking	*Normal Deviate (z) for CCC versus HC*	*Normal Deviate (z) for CCC versus TCC*	*Normal Deviate (z) for TCC versus HC*
Pairwise Comparison:			
A > D	1.831*	1.331	0.557
B > D	2.347*	1.246	1.190
A > C	1.831*	1.112	0.779
C > D	2.685**	1.434	1.369
A > B	2.582**	2.108*	0.558
B > C	1.831*	−0.220	2.107*
Triple Comparison:			
A > C > D	2.357**	1.266	1.165
A > B > D	2.089*	1.518	0.626
B > C > D	2.858**	1.581	1.445
A > B > C	2.098*	1.491	0.666
Quadruple Comparison:			
A > B > C > D	2.383**	1.240	1.221

*significant at $\alpha = .05$ or less (one-tailed test).
**significant at $\alpha = .01$ or less (one-tailed test).

TCC and HC. The results in Table 3 support H2, which hypothesized that current cost information improves decisions when the realized and unrealized components are separately disclosed. The difference between CCC and HC is significant at $\alpha < .05$ for all comparisons. As can be seen from Table 2, the percentage of correct responses under CCC was 51 percent, compared to 37 percent for TCC and 23 percent for HC.

H1 and H3 were not supported. The difference between CCC and TCC and between TCC and HC were in the predicted direction but were not significant at conventional levels.[7] The observed *p*-value for TCC versus HC is .12 for the quadruple comparison, and for CCC versus TCC it is .11.

In summary, the results are consistent with the hypothesis that disclosure of current value income is useful for decisions when separated into trading (realized) and holding (unrealized) components. These results cast doubt on the suggestion by Ijiri and Noel [8] that historical cost statements are "better" than current cost statements. Although Ijiri and Noel also used a commodity trading firm for their analysis, they defined an income measure as

7. In addition to the results reported here we employed the Wilcoxin rank-sum test to examine which group of subjects was able to more accurately rank the firm. The results parallel those for the binomial test and are not reported here.

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"better" if it was more reliable using the Ijiri and Jaedicke [7] measure of reliability. We were able to circumvent their need for choosing a characteristic of a measure as reflecting a better measure of income. Instead, we measured the accuracy of user decisions. Hence, although we do not argue that the CCC income is better from the perspective of measured reliability, we do provide evidence of improved investment decisions using these data.

4. Conclusions and Limitations

The results of this study suggest that subjects performed better in ranking the attractiveness of commodities firms for investment when provided with current cost dichotomized data as opposed to only historical cost data. The study suffers from at least two limitations. First, by using firms dealing in commodity futures we exclude consideration of current values for fixed assets. Fixed assets are a significant asset for most firms. Second, because the subjects were not in an actual market setting, the subjects' decisions had no direct economic consequences. That is, subjects were not required to make investment decisions where actual payoffs depended on their decision. One extension of this research would be to conduct a laboratory market experiment in which the form of the disclosed information was the manipulated variable among markets. In this way, equilibrium implications of this disclosure issue could be examined.

In conclusion, prior studies have shown that financial statement users desire to have current cost information available, but there is little evidence that such data are actually useful. This study used a unique experimental approach in which it was possible to unambiguously identify the relative performance of firms. The instrument allowed us to evaluate performance in a realistic investment task, the ranking of firms, using three alternative forms of disclosure. Our results indicate that subjects performed better when given current cost data dichotomized between realized and unrealized holding gains and losses than when given only historical cost data. Thus, the results support the hypothesis that at least in some situations, current cost information is incrementally useful for decision making.

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