Identifying Decision Useful Information with the Matrix Format Income Statement

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Identifying Decision Useful Information with the Matrix Format Income Statement

Abstract

We conduct an experiment to investigate the potential benefits of an alternative format for the income statement, the matrix format, initially developed by the IASB and UK ASB in their joint project on performance reporting. Sophisticated financial statement users (financial analysts and professional accountants) and less sophisticated financial statement users (MBA students) were asked to extract information from a set of financial statements that included an income statement either in the IAS 1 format or in the matrix format. We find that the matrix format improves the accuracy with which users extract financial information. This result is driven by greater accuracy, for all user groups, on 'below-the-line' items. Furthermore, despite lack of familiarity with the matrix format, its use did not appear to affect the time taken, the ease of extracting financial information, or users' task completion confidence; further experience with the matrix format could lead to benefits along these lines as well. Our findings may assist the FASB and IASB in their joint project on financial statement presentation.

Key words: Financial statement presentation; matrix format income statement; recycling.

1. Introduction

This paper reports the results of an experiment to investigate the potential benefits of providing information via an alternative format of the income statement, called the matrix format. This format was developed during 2001-2003 as part of the International Accounting Standards Board's (IASB) joint project with the UK Accounting Standards Board (ASB) on performance reporting. The objective of the project was to ensure that in reporting their results, entities would "…categorise and display all income and expenses for the period in a way that enhances users' understanding of the entity's financial results …" (IASB, 2003, p. 2). The matrix format was proposed as a way of achieving this aim. It presents a three column statement comprising a total column that includes all items of income and expense for the period (that is, a single statement of comprehensive income) and two further columns that provide a line-by-line disaggregation of the items into "remeasurements" and "before remeasurements" (Barker, 2004).[1]

Our study is motivated by calls for policy-relevant accounting research (Schipper, 1994; Leisenring and Johnson, 1994). It also meets Bonner's (1999) framework because it is research based on a decision that needs improvement and the proposal can be implemented in practice. The Financial Accounting Standards Board (FASB) and IASB are currently engaged in a joint project on financial statement presentation which includes consideration of the presentation of comprehensive income (FASB, 2006; IASB, 2006). Our experiment provides evidence on three of the key issues that face the FASB/IASB joint project: the usefulness of (1) a single statement of comprehensive income, (2) line-by-line disaggregation of the statement items between remeasurements and before remeasurements and (3) taking items directly to equity and permitting 'recycling'.[2]

Despite there being no conceptual arguments for a two statement approach to reporting comprehensive income and that the FASB and IASB each showed a preference for a single statement approach, both boards have allowed two statements as a practical compromise. Resistance to a single statement of comprehensive income came from constituents who argued that the multiple performance measures reported in a single income statement would be "confusing" (Foust and Zweig, 1997) and "misleading" (King *et al.*, 1999). Similar arguments have been made against the multiple column matrix format (IAS Plus, 2006a). The basis for such arguments is a concern with the ability of users to understand the information presented.[3] We investigate the potential benefits of changing to the matrix format by

comparing the accuracy, difficulty (ease of use) and confidence of subjects in extracting specific information from an income statement presented in the matrix format relative to the same information as reported under the 2005 version of IAS 1 *Presentation of Financial Statements*.

The results show that the matrix format improves accuracy in the extraction of information from the financial statements. The overall improvement reflects insignificant change in accuracy on 'above-the-line' items (i.e., items reported in IAS 1 income) but strongly improved accuracy on 'below-the-line' items (i.e., "other comprehensive income" or "dirty surplus" items not reported in IAS 1 income but taken directly to equity). The greater accuracy on below-the-line items would seem to reflect the increased transparency of the matrix format, which separately displays remeasurement items and shows them all on the income statement. Despite subjects' lack of familiarity with the matrix format, its use does not appear to increase the time taken or difficulty in extracting information nor decrease users' confidence in their results.

Our findings complement and support prior experimental research that examines comprehensive income items (e.g., Hirst and Hopkins, 1998; Maines and McDaniel, 2000; Hirst *et al.* 2004; Hunton *et al.*, 2006). We differ from prior research on a number of dimensions. First, rather than focus on usefulness of comprehensive income for setting stock prices or for predicting future earnings, we focus on more immediate characteristics of user behaviour. Second, we examine the matrix format which provides a specific decomposition of comprehensive income. Given that the matrix format has not been implemented to date, an experiment is one means of providing *ex ante* research that is useful for standard setters (Beresford, 1994; Schipper, 1994; McDaniel and Hand, 1996). Third, in order to improve the external validity of our results we employ subjects representing sophisticated financial statement users (financial analysts and professional accountants) and less sophisticated financial statement users (MBA students as proxies for business people) and include a measure of competency of our participants. Given the international dimension of the standard setting debate, we select subjects from a range of different countries.

The rest of the paper is organized as follows. Section 2 reports on reaction to the matrix format and discusses prior research on the reporting and disaggregation of comprehensive income. Section 3 develops the hypotheses. Section 4 describes the experiment and section 5 reports the results. Section 6 provides a summary and conclusions.

2. Reaction and Prior Research

2.1 Reaction to the Matrix Format

The matrix format is a single statement of income, with three columns of presentation based around remeasurements of financial statement items. Supporters argue that it will enhance transparency and assist users to more efficiently analyse performance and predict future earnings and its components (Damant, 2003; Barker, 2004). The matrix approach is a major departure from the current single column income statement. Field testing showed that many users indicated preference for a single number (such as net income) as the measure of performance and that preparers wanted more flexibility to present their firm in a way that was consistent with their business (IAS Plus, 2006a).

Some constituents claim that reporting comprehensive income in a single statement and in multiple columns (i.e., the matrix format) does not provide useful information. A US survey of chief financial officers finds they consider comprehensive income to be either "misleading" (38.5%) or "not useful" (35.9%) (King *et al.*, 1999). Constituents have argued that multiple performance measures will make financial statements more confusing (Foust and Zweig, 1997) or investors will be myopic and use comprehensive income as the only performance measure. Another concern, particularly from financial institutions, is that volatility of comprehensive income will lead to perceptions of increased risk. The IASB has commented that while many users saw merit in the matrix, the Board has a major educational task on its hands (IAS Plus, 2006a).

2.2 Prior Research

Several studies investigate the value relevance of comprehensive income items and present mixed results, reflecting variations in the items considered and the time and location of the studies (Dhaliwal *et al*., 1999; Skinner, 1999; Biddle and Choi, 2006; Dee, 2000; Dehning and Ratliff, 2004; Chambers *et al.*, 2006; O'Hanlon and Pope, 1999; Cahan *et al.*, 2000; Lin, 2006; Kanagaretnam *et al.*, 2007). In contrast, the focus of this study is presentation rather than value relevance.

One interpretation of the efficient market hypothesis is that it should not matter where an item is displayed within the financial statements. As long as users are provided with the information, where an item is presented should not affect decision making.[4] However, studies

show preparers consider location important. Pandit and Phillips (2004) find that entities for which other comprehensive income is negative are almost twice as likely to report it in the statement of changes in stockholders' equity rather than in a separate or single statement of comprehensive income. Lee *et al*. (2006) report that insurers with a tendency to manage earnings through realized securities' gains and losses and those with a reputation for poor financial reporting quality are more likely to disclose comprehensive income items in the statement of changes in stockholders' equity. Hunton *et al.* (2006), in an experiment with public company CFOs and CEOs, show that the greater transparency arising from reporting comprehensive income in a performance statement rather than in a statement of equity is associated with less likelihood that managers will engage in earnings management.

Experimental studies suggest that the manner of display of comprehensive income is important. Maines and McDaniel (2000) argue that presentation format influences investors' information processing and resulting judgements by affecting the acquisition, evaluation and weighting of comprehensive income information. Hirst and Hopkins (1998) investigate whether reporting of comprehensive income influences financial analysts' estimates of the value of a firm that actively manages earnings through its available-for-sale marketable securities portfolio. The authors conclude that clear income statement display of comprehensive income and its components is effective in enhancing transparency of earnings management and reducing analysts' valuations to the same level as observed for an identical firm that does not manage earnings.

The Hirst and Hopkins' (1998) study is important because of its implications for optimal presentation format. However, there is scope to extend their work. As Maines and McDaniel (2000, p. 183) note, "it is not clear whether analysts who indicated that they saw the term 'comprehensive income' actually read the unrealized gains and losses information". That is, because the statement of changes in equity is considered relatively unimportant in valuation (Brown, 1997), subjects may have not have used the information contained therein. Furthermore, analysts may not use the information about marketable securities in making stock price judgments about a manufacturing firm as used by Hirst and Hopkins (1998).[5]

As Hirst and Hopkins' (1998) results may not generalize to non-professional investors, Maines and McDaniel (2000) consider whether presentation affects the processing of comprehensive income information for this group. They report that judgments of corporate and management performance reflect the volatility of unrealized gains and losses on

available-for-sale marketable securities only when the relevant information is presented in a separately disclosed statement of comprehensive income. In a further study with analysts, Hirst *et al.* (2004) explore whether the manner in which banks measure and report comprehensive income affects specialist analysts' risk assessments and valuation judgments. They find that analysts, in their valuation judgments, consistently distinguish between banks with different levels of risk only with full fair value accounting and that the likelihood of analysts using fair value information is higher with full fair value accounting. This result is consistent with analysts making greater use of information that is readily available.

Thus, evidence suggests that the form of presentation of comprehensive income affects user decision making. Our study adds to prior studies as it addresses an earlier stage in the information processing cycle – whether the extraction of information of varying complexity is improved by the matrix format. In addition, we use a competency measure which controls for differences in subjects' ability (or attention to the experimental task).

Our experiment includes a relatively large number of remeasurement items and draws attention to the items, then tests whether subjects can extract potentially value relevant information from the disclosures. We explore additional aspects of the remeasurement items, namely whether they are above-the-line or below-the-line and the impact of recycling and we consider the matrix format which has not been explored in prior experimental research. Prior research has a US (SFAS 130) focus. In contrast, this study has an IFRS setting (with participants from many IFRS jurisdictions) and investigates existing requirements of IAS 1 against an alternative format – the matrix. The experiment has a large number of participants, thus reducing the likelihood that results are driven by a small number of the subjects.

3. Hypotheses

The matrix format is a single statement of comprehensive income and is designed to improve the display of information on remeasurements. Claims have been made that the matrix format will mislead, confuse or require a major educational task. The claims are important because understandability is one of the principal qualitative characteristics in both the FASB and IASB conceptual frameworks. Experimental evidence on the benefits of the single statement matrix format of comprehensive income relative to the status quo could therefore assist the FASB/IASB joint project. To investigate the potential benefits, we examine four aspects of users' ability to extract the same data from the two alternative formats.

Our primary test focuses on accuracy. Based on the findings of prior studies (Hirst and Hopkins, 1998; Maines and McDaniel, 2000; Hirst et al., 2004; Hunton et al., 2006) we expect that presenting comprehensive income in the single statement three column presentation of the matrix format will improve the accuracy with which users extract information. The following null hypothesis is tested:

H1: There is no difference in accuracy when extracting information from the matrix format compared to the IAS 1 format.

In the analysis of accuracy we distinguish between above-the-line and below-the-line items. Above-the-line items are included in net income under both the matrix format and the IAS 1 format, whereas below-the-line items are other comprehensive income items included in net income in the matrix format but reported in the equity section of the balance sheet under the IAS 1 format. It is expected that accuracy for above-the-line items is similar regardless of whether the matrix or IAS 1 format is used. Assuming a positive effect for the matrix format, it should significantly improve accuracy for below-the-line items. The following null hypothesis is tested:

H2: There is no difference in accuracy for (a) above-the-line items and (b) below-the-line items when extracting information from the matrix format compared to the IAS 1 format.

We also examine three other matters that are likely to impact on the potential benefits of the matrix format. They are the time taken to extract data, and users' perception of ease of use and their confidence in their answers. Therefore, the following null hypothesis is tested:

H3: There is no difference in (a) speed, (b) ease of use, and (c) confidence when extracting information from the matrix format compared to the IAS 1 format.

The performance of less sophisticated users (those with less understanding of accounting) may differ according to the presentation format of the financial statements (Maines and McDaniel, 2000). Thus users' performance in extracting information may depend on their financial knowledge and experience. Therefore, in testing H1 to H3 a competency measure is included to control for differences in financial expertise.

4. Experiment

4.1 Instruments

Subjects received two booklets, the first containing one of two versions of a set of financial statements and the second booklet the instructions and questions. The first version of the financial statements included an income statement and statement of changes in equity based on the 2005 IAS 1 format. The second version used the matrix format for the income statement, where the total column includes all items of income and expenses (thus reporting comprehensive income in a single statement) and two additional columns for a line-by-line disaggregation between remeasurements and before remeasurements (hereafter designated as IAS 1 and MATRIX respectively). Both versions contain exactly the same financial information, albeit in a different format. All subjects received an income statement, balance sheet, statement of changes in equity, cash flow statement and selected notes to the accounts. Appendix A illustrates the key differences between the IAS 1 and MATRIX versions of the income statement.[6]

To create the MATRIX version, a set of IAS 1 financial statements were reformatted to follow the matrix format released by the IASB in 2003 (Barker, 2004; IAS Plus, 2006b). The following transactions and events, covering a wide range of current and non-current, tangible and intangible assets and liabilities were included: impairment of inventory, tangible assets (property, plant and equipment) and an intangible asset (goodwill); foreign exchange translation gain on net investment in a foreign operation; fair value changes in available-for-sale investments and cash flow hedges; remeasurement of a provision (employee entitlements); and disposal gain/loss (property, plant and equipment). Considering subjects' time constraints, the following transactions and events were not included: changes in relation to pension obligations (discount rate, cash flow assumptions and return on plan assets), return on equity investments (that is, result of equity accounting) and net discontinued activities. Furthermore, foreign currency translations, followed by unrealized gains or losses on available-for-sale investments, are the more frequents components of other comprehensive income and are larger monetary amounts than minimum pension liabilities (Bhamornsiri and Wiggins, 2001; Pandit and Phillips, 2004).

The second booklet contained the instructions and questions.[7] Subjects were told that the data provided would be used to assess the effectiveness of different ways of presenting financial statements. The instructions included a brief description of the three sets of questions to follow and concluded with assurances of anonymity. Subjects were asked to first complete Question Set 1, which requested brief biographical details. In Question Set 2, subjects

were requested to provide answers to 23 questions relating to the financial statements. In Question Set 3 subjects were asked to record the time taken to complete Set 2, how easy they found the task, and how confident they were about the answers they had given to the financial statement questions.

4.2 Case study questions

In Question Set 2, subjects were required to extract factual data from the financial statements. The subjects were not required to use the information to make a judgment or decision. However, the questions related to information that typically would be used in the assessment or estimation of maintainable earnings. The 23 questions related to seven financial statement items: inventory; held-for-trading investments; property, plant and equipment; goodwill; employee entitlements; translation of foreign currencies; and available-for-sale investments. The first five items are above-the-line items because the remeasurement of these is currently reported in income for the period. The last two items are below-the-line items because their remeasurements are taken directly to equity and not reported in net income.[8] The 23 questions, which included 10 competency questions and 13 remeasurement questions, are listed in Appendix B.

4.2.1 Competency questions The competency questions asked subjects to locate information about financial statement items from the balance sheet, cash flow statement and notes to the financial statements. They do not address remeasurement issues. For example, the questions ask about accounting policies and the amount of cash used for particular types of expenditures. The competency questions comprise five above-the-line and five below-the-line items and have the same answer in both the IAS 1 and MATRIX versions of the financial statements. The competency questions are included to provide a measure of subjects' ability to extract financial information.

4.2.2 Remeasurement questions The remeasurement questions ask subjects to identify amounts due to remeasurement, recognition, and realization of items. The remeasurement questions cover six above-the-line items and seven below-the-line items. This distinction is used to allow us to further explore the impact of the matrix format on the extraction of financial information.

The six above-the-line remeasurement questions relate to items included in the determination of net income in both the IAS 1 and MATRIX versions of the financial

statements. The answers to the questions are the same in each version. The only difference between the versions is in *presentation*: the one column income statement in the IAS 1 version and the three column format in the MATRIX version. For above-the-line items, the experiment investigates the impact of showing items in a columnar display in the matrix format versus the IAS 1 single column income statement.

For the below-the-line remeasurement items, the IAS 1 and MATRIX versions differ on two dimensions, namely *columnar presentation* and *including items in the determination of net income*. First, the IAS 1 version reports items in a single column, while the MATRIX displays three columns (before remeasurements, remeasurements and the total). Second, under IAS 1 the below-the-line remeasurement items are not included in income. In the MATRIX version, below-the-line remeasurement items form part of income in a single statement and therefore the status of below-the-line items effectively changes to being above-the-line. Of the seven below-the-line remeasurement questions, three questions have the same answers in both the IAS 1 and MATRIX versions and four questions have different answers because in the IAS 1 version the related items are below-the-line while in the MATRIX version the items are included in the determination of net income.

In summary, above-the-line remeasurement items allow a comparison of the single column IAS 1 format with the three-column matrix format. The below-the-line remeasurement items allow a comparison of the single- and three-column presentations and assessment of the effect of including all remeasurements in a single income statement. In addition, the seven below-the-line items include three that were affected by recycling and four that were not, thus permitting analysis of items with and without recycling.

The instruments were subject to an extensive development process. Earlier versions were pre-tested using accounting and finance academics in Australia and New Zealand, accounting practitioners, graduate students and sophisticated investors. A preliminary experiment was conducted using 91 MBA students in Australia, New Zealand, and Singapore. The results indicated that the matrix format income statement had the potential to improve the accuracy with which subjects could extract decision useful information. Based on these initial results and discussions with standard setters, practitioners and researchers it was decided to expand the study to a broader range of financial statement users from a larger group of countries.

4.3 Subjects

The IASB *Framework* (paragraph 9) identifies a wide range of users who may depend on general purpose financial reports as their major source of financial information. Therefore subjects with a range of knowledge and experience in relation to financial statement analysis were included in the experiment. Financial analysts and professional accountants were selected as being representative of sophisticated financial statement users (people with a high level of financial expertise derived from formal business education and relevant experience) and MBA students – as proxies for other business people – as being representative of less sophisticated financial statement users. Also, given the global reach of IASB standards and the possibility that differences in users' ability to extract information may be due to cultural, social and legal environments (Rotenberg, 1995), subjects were selected from a range of countries.

There were 477 subjects in the experiment, including 168 financial analysts who were members of the USA CFA Institute (26), UK Society of Investment Professionals (18), the Swiss CFA Society (8), the Securities Analysts Association of Japan (91), the Financial Services Institute of Australasia (9), the Institute of Finance Professionals New Zealand and the CFA Society of New Zealand (16); 110 professional accountants from KPMG Australia and PricewaterhouseCoopers New Zealand; and 199 post-graduate MBA students from the USA (20), Australia (84), Singapore (66) and New Zealand (29).[9] Due to the diverse locations of subjects, the experiment was completed in supervised and unsupervised settings (230 and 247 subjects respectively). Participation was voluntary in all cases. The invitation to participate was extended to a large number of analysts and accountants through their professional organization or firm. Those that chose to participate were not only experts but also willing participants. Some subjects in each of the three groups completed the experiment in a supervised setting by attending a seminar or class (organized by their professional body, employer or lecturer). Subjects in the unsupervised setting were mainly analysts and accountants. They completed the experiment and returned it by mail or via a website. Participants received no training in the matrix format and were likely to have had little prior experience of it. After agreeing to participate, subjects were randomly allocated the IAS 1 or MATRIX statements.

Table 1 reports by group the number of subjects, the gender composition, the average number of years of work and professional experience, and the proportions completing IAS 1 and MATRIX. The proportion of males in each group is 90% for analysts, 64% for accountants, and 69% for MBA students. Work experience ranges from 10.3 to 12.1 years on

average in the three groups, suggesting all subjects have substantial experience in a business environment. Differences across the three groups are not statistically significant. The subjects also have reasonable experience in their professional roles but the accountants are more experienced than the financial analysts: 7.3 years on average for analysts and 11.5 years for accountants. The proportion of subjects completing the MATRIX version was 52% for financial analysts, 49% for the accountants and 51% for the MBA students.

Insert Table 1 about here

5. Results

5.1 Accuracy

Accuracy is measured by the score obtained on the remeasurement questions, comprising the total for all remeasurement questions and sub-totals for above-the-line and below-the-line questions. Panel A of Table 2 shows significant differences between the groups in mean accuracy scores for the 13 remeasurement questions between the groups ($F = 143.70$, $p < 0.001$).[10] Both analysts and accountants scored significantly higher than the MBAs students (both $p < 0.001$) reflecting their financial expertise but there is no significant difference between the two expert groups ($p = 0.250$). Within subjects group variability, as measured by standard deviation, is similar for each group (17.44 for analysts, 18.22 for accountants and 17.06 for MBAs). The range of scores is identical between the analysts and the accountants (7.69 to 92.31%). As expected, these two groups performed better than the MBA students whose scores ranged from 0 to 76.92%.

Panel B of Table 2 provides descriptive statistics for the competency questions. There are significant differences in mean scores between the groups ($F = 159.18$, $p < 0.001$). The results for the financially sophisticated groups (analysts and accountants) are not significantly different ($p = 0.444$) but both outperformed the MBA students ($p < 0.001$ in each case). The within subjects group variability, as measured by standard deviation, was less for the analysts and accountants and greater for the MBA students. The strongest indication of the differences among the groups is given by the percentage of subjects in each group scoring at least 90%: 63% for the financial analysts, 69% for the accountants and 8% for the MBA students. The differences in scores between the three groups are as expected.

Insert Table 2 about here

The Pearson correlation (n = 477) between accuracy and competency was 0.680, $p < 0.001$.[11] Accuracy is associated with competency and therefore the COMPETENCY score is used to control for differences in knowledge and experience between subjects. An analysis of variance, where the dependent variable is the accuracy percentage achieved by the subjects on either the above-the-line or below-the-line remeasurement questions, was run with the COMPETENCY score entered as a covariate. The format of the experiment is therefore a mixed design with TYPE (above or below-the-line questions) being a within subjects variable while VERSION (IAS 1 or MATRIX) and GROUP (analysts, accountants or MBA students) are between subjects variables. In this ANOVA (untabulated), GROUP had a significant main effect ($F = 44.463$, $p < 0.001$) and a significant interaction with TYPE ($F = 28.297$, $p < 0.001$). GROUP did not interact with VERSION ($F = 0.226$, $p = 0.798$), showing that the impact of the MATRIX does not differ between groups.[12]

Since there were differences in accuracy between the three groups, results for the 2x2 analysis for each group are presented followed by an analysis of group differences (Tables 3, 4 and 5). The dependent variable is the accuracy percentage achieved by the subjects on either the above-the-line or below-the-line questions; COMPETENCY is a covariate, TYPE is a within subjects variable and VERSION is a between subjects variable. For all three groups of users, the results are not sensitive to country of origin. The same inferences are drawn based on ANOVAs which exclude each country, in turn, from the analysis.[13] In addition, order of question, participant experience, and method of data collection (supervised or unsupervised) are not significant factors.[14]

5.1.1 Financial Analysts Table 3 Panel A shows higher accuracy for analysts on MATRIX compared to IAS 1 (58.27% vs 51.38%) and for above-the-line compared to below-the-line questions (74.40% vs 38.27%). The MATRIX version results in greater accuracy for below-the-line (46.96% vs 28.92%) questions but for above-the-line questions the levels of accuracy are similar (71.45% vs 77.57%). These findings support the predicted view that accuracy is greater with the matrix format, but only for below-the-line items.

Table 3 Panel B shows that, after controlling for COMPETENCY, VERSION and TYPE have significant main effects ($p = 0.001$ and $p < 0.001$) and TYPE has a significant interaction with VERSION ($p < 0.001$). To explore this interaction further, we compared scores for above-the-line and below-the-line items both between and within VERSIONS. Panel C shows that the main effect for VERSION is driven by its interaction with TYPE. As suggested by

Panel A, the overall superior performance of the MATRIX results from below-the-line items. The 46.96% accuracy for the MATRIX was significantly higher than the 28.92% for IAS 1 ($t = 5.666$, $p < 0.001$) while the performance on the above-the-line items was significantly different across VERSIONS only at the 10% level ($t = 1.823$, $p = 0.070$).[15]

Overall, analysts performed better on above- than below-the-line questions, for both the IAS 1 and MATRIX versions ($t = 18.305$, $p < 0.001$; $t = 8.932$, $p < 0.001$ respectively). These results indicate that there may be some fundamental difference in the nature of above and below-the-line items, and that the former are easier to understand. Recall that below-the-line questions address foreign currency translation and available-for-sale investments and may be more difficult to understand as they are taken directly to equity and can involve recycling. This issue is considered later in the paper. The results suggest that, in relation to these more complex remeasurement items, the presentation of information in the MATRIX, compared to IAS 1,will benefit analysts substantially.

Insert Table 3 about here

5.1.2 Accountants Table 4 Panel A shows that the accuracy results for the 110 accountants are consistent with those of the analysts. Panel B shows main effects for VERSION and TYPE and a significant VERSION/TYPE interaction, after controlling for competency. Again, the significantly higher accuracy rate of the MATRIX (64.10% vs 53.43%, Panel A) is driven by the more complex below-the-line items (52.65% vs 33.93%, Panel A; $t = 4.677$, $p < 0.001$, Panel C). There are similar levels of accuracy for the above-the-line items between versions (77.47% vs 76.19%, Panel A; $t = 0.321$, $p = 0.749$, Panel C). Like the analysts, the accountants found the below-the-line items more difficult in both IAS 1 and MATRIX formats (Panel C).

Both the financial analysts and accountants can be regarded as representative of sophisticated users of financial data. Results for the two groups are not statistically different and they exhibit similar competency levels (Table 2). Further parametric and non-parametric tests (untabulated) reveal their accuracy in each of the four cells examined in Panel A are not significantly different. Therefore, the results suggest that the MATRIX increases accuracy for sophisticated users, allowing rejection of (null) H1. The increase is related to below-the-line items with no statistically significant difference in accuracy for above-the-line items, thus H2b is rejected but H2a is not.

Insert Table 4 about here

5.1.3 MBA students The results for MBA students show that accuracy was much lower for this group than for the analysts and accountants. However, the effect of the matrix format on accuracy is consistent with that discussed above for analysts and accountants. Table 5 reveals the MATRIX outperformed IAS 1 (main effect for version Panel B, interaction VERSION and TYPE Panel B; 33.05% vs 24.41% Panel A; $t = 3.696$, $p < 0.001$, Panel C). The result reflects the score on below-the-line items (29.14% vs 12.98%) and not above-the-line items (37.62% vs 37.76%). Again, subjects found the below-the-line items harder irrespective of the format in which the information was presented. As for analysts and accountants, we can reject H1 and H2b but not H2a.

Competency is again a significant determinant of accuracy (Panel B). In addition, the same results are obtained if the less competent subjects (competency score < 50%) are excluded from the analysis. The most notable feature of Table 5 compared to Tables 3 and 4 is lower scores reported in Panel A compared to the scores of analysts and accountants. This is consistent with MBA students being less sophisticated users and reflects the significantly lower competency score reported earlier. In conclusion, our null hypotheses that there is no significant difference in accuracy for IAS 1 compared to MATRIX can be rejected for both sophisticated and less sophisticated financial statement users.

Insert Table 5 about here

5.1.4 Inter-group analysis The initial analysis (untabulated) showed a main effect for GROUP with a significant interaction between GROUP and TYPE. Accuracy scores (Panel A of Tables 3, 4 and 5) reveal that analysts and accountants performed better than MBA students. A series of one-way ANOVAs for above-the-line accuracy, below-the-line accuracy and overall accuracy for both formats (IAS 1 and MATRIX) and overall confirm this, with all nine analyses reporting significant differences between groups ($p < 0.001$). Post hoc tests reveal that in all cases the analysts and accountants were both significantly more accurate than the MBA students ($p < 0.001$) while there were no significant differences between the analysts and the accountants.

The interaction between GROUP and TYPE suggests a difference between the groups in their accuracy for above- and below-the-line items. Therefore the difference between subjects' above- and below-the-line accuracy rates (incremental accuracy) is calculated and analysed across VERSION and GROUP. Since there were no significant differences between the analysts and accountants they were combined into one group (Sophisticated) and compared to the MBA students (Less sophisticated). Table 6 Panel B reports the results of a 2x2 (IAS 1 and MATRIX; Sophisticated and Less sophisticated) ANOVA of the incremental accuracy measure. As expected, competency is a significant covariate. The analysis reveals significant main effects for both VERSION and SOPHISTICATION with an insignificant interaction. [16]

The results for VERSION confirm the earlier analysis. For all types of users the MATRIX reduces the difference in accuracy between the above-the-line items and the more complex below-the-line items. For sophisticated users the difference is significant, from 46.04% to 24.62% (Panel A; $t = 7.373$, $p < 0.001$, Panel C). For less sophisticated users the difference between 24.78% and 8.49% (Panel A) is also significant ($t = 4.728$, $p < 0.001$, Panel C). Hence, the MATRIX format makes more complex items more understandable for all subjects.

Incremental accuracy varied between subjects, according to their level of sophistication with sophisticated users revealing a significantly larger difference between above and below-the-line items in both the IAS 1 (46.04% vs 24.78%, Panel A; $t = 7.016$, $p < 0.001$, Panel C) and MATRIX formats (24.62% vs 8.49%, Panel A; $t = 4.854$, $p < 0.001$, Panel C). The findings suggest that sophisticated users are skilled in relation to above-the-line re-measurements, but find the below-the-line items much more complex. Thus a larger difference in accuracy across TYPE is observed for these users. In relation to less sophisticated users, the difference is less because they appear to find all items complex. However, relative to the mean accuracy on above the line items for IAS 1 and MATRIX, the improvement in incremental accuracy for sophisticated users through the use of MATRIX is 28% whereas for the less sophisticated users (who are coming off a substantially lower base) the corresponding improvement is 43%.

Insert Table 6 about here

5.1.5 Recycling The results presented in Tables 3, 4 and 5 show that the subjects performed better on above-the-line than below-the-line items and that those using the matrix format were

able to extract information about below-the-line items with greater accuracy. In this experiment, below-the-line items taken directly to equity as per IAS 1 relate to foreign currency translation and available-for-sale investments. Unlike foreign currency translation amounts which are not recycled in this experiment, available-for-sale investments are recycled through equity. That is, the change in fair value subsequent to acquisition[17] is recognized directly in equity and when the available-for-sale investment is sold the amount previously reported in equity is reclassified (recycled) out of equity, reported in profit or loss for the year of sale and then returned to equity via current year net income (Deloitte, 2006). Recycling increased the complexity of the available-for-sale amounts reported in both the income statement and statement of changes in equity. Therefore, we investigated whether the results for the below-the-line items were driven by removing recycling rather than reporting them directly in equity.

In the experiment there were seven below-the-line questions. Three related to amounts which were affected by recycling (BTL recycling) and four did not (BTL non-recycling).[18] Subjects' accuracy on these two subsets was calculated. The analyses reported in Tables 3, 4 and 5 were repeated using scores for BTL recycling and BTL non-recycling questions, instead of all below-the-line questions. In Panel C of Tables 3, 4 and 5 'Below-the-line' reports the results of tests of difference between IAS 1 and MATRIX for all seven below-the-line questions. Table 7 complements that analysis by reporting the same tests for the two subsets of below-the-line questions, namely BTL recycling and BTL non-recycling.

Insert Table 7 about here

For analysts, Table 7 shows no change from the results presented in Table 3. Accuracy significantly improves with MATRIX compared to IAS 1, when either all below-the-line questions are included (Table 3, $p < 0.001$) or one of the subsets of below-the-line questions is considered (Table 7, recycling and non-recycling both $p < 0.001$). Accuracy is significantly greater for non-recycling than for recycling questions for both IAS 1 and MATRIX (Table 7, $p < 0.001$), consistent with recycled items being the least understandable of those presented in financial statements.

When only BTL recycling questions are considered (Table 7) the results for accountants differ from those presented in Table 4. VERSION and the VERSION x TYPE interaction are no longer significant. This reflects the accuracy scores on the recycling questions, which are

significantly different between IAS 1 and MATRIX only at the 10% level (17.26% vs 25.92%, t = 1.808, p = 0.073, two-tailed test, Table 7).[19] Among the three groups, accountants appear to have the best understanding of recycling, which is not surprising given this groups' technical expertise. Thus, the relative improvement in accuracy for BTL recycling questions when MATRIX is used is less than that observed in the other two groups. For BTL non-recycling questions, Panel B's ANOVA is essentially the same as shown in Table 4. However, the test within the matrix comparing accuracy for above-the-line and below-the-line questions is no longer significant (77.47% Table 4 vs 72.69% Table 7, t = 1.303, p = 0.198, untabulated). Thus, for accountants, improvements in accuracy in MATRIX derive more from the non-recycled questions. Similar to the analysts, accuracy is higher for non-recycled than for recycled questions under either version.

The results for the MBA students were similar to those for the analysts. Considering the subgroups of below-the-line questions (recycling or non-recycling) did not change the results reported in Table 5. Accuracy for both recycled and non-recycled questions was significantly higher under MATRIX (Table 7, both $p < 0.001$) and, like the other groups, MBA students found questions involving recycling more difficult. The MBA students were similar to the accountants in that the MATRIX's greater accuracy for above- compared to below-the-line disappeared when only BTL non-recycling questions were used (37.62% Table 5 vs 32.92% Table 7, t = 1.512, p = 0.134, untabulated).

Thus the findings in respect of increased accuracy for below-the-line items in MATRIX compared to IAS 1 are robust to whether recycled or non-recycled questions are used to calculate accuracy for both analysts and MBA students. The accountants' presumed greater understanding of recycling reduced the impact of the matrix on that group's results. Notwithstanding this result, the accountants still did better on the non-recycled questions using the matrix. Overall, for MATRIX but not for IAS 1, the higher accuracy for the presumed easier above-the-line questions disappeared when above-the-line questions were compared to BTL non-recycling questions. This result provides strong support for disclosure of income items in a single statement. In this experiment, the IAS 1 above-the-line questions were not easier but rather they were more transparent. Including the IAS 1 BTL non-recycling items in a single statement in MATRIX reduced the difference in accuracy between above- and below-the-line questions for all subjects. Furthermore, accuracy for BTL recycling questions was greater for MATRIX for all groups.

5.2 Speed, Ease of Use, and Confidence

Information about speed, ease of use, and confidence was also collected. Subjects were asked how many minutes it took to complete Question Set 2 (TIME); how easy they found it to extract the required information (0 to 10 scale, 'not at all easy' to 'very easy') (EASE); and how confident they were that they had answered at least 70% of the questions correctly (0 to 10 scale, 'not at all confident' to 'very confident') (CONFIDENCE).

Table 8 Panel A reports the results of multiple comparisons showing significant differences between the groups on all three of the above measures both within versions and overall. Post hoc tests reveal accountants found the task easier than both analysts ($p < 0.001$) and MBA students ($p < 0.001$) while analysts found the task easier than MBA students ($p < 0.001$). Similarly, accountants were more confident than the analysts ($p < 0.001$) and the MBA students ($p < 0.001$) while the analysts were more confident than the MBA students ($p < 0.001$).

Although less competent and confident than the more sophisticated participants, MBA students did not take longer with the task, possibly because most MBA students did the experiment in a laboratory setting while most of the other participants did not. Overall, analysts took significantly longer over the task than accountants ($p < 0.001$) and MBA students ($p < 0.001$). There was no significant difference in time taken between the accountants and the MBA students ($p = 0.528$). Similar results are found when the post hoc tests are restricted to those who used IAS 1 and those who completed MATRIX. The only significant difference between VERSIONS on these measures was for TIME for the MBA students, where MATRIX users took a few minutes less than those with IAS 1 ($t = 2.24$, $p = 0.026$).

Table 8 Panel B shows the results of ANOVAs with the above TIME, EASE and CONFIDENCE measures as the dependent variable, COMPETENCY as a covariate and VERSION, GROUP and LAB (method of data collection by either mail or in a laboratory setting) as between subject variables.[20] In none of the three analyses was VERSION significant, whether as a main effect or an interaction. This suggests that Hypothesis 3 is not rejected. The results provide indirect support for the matrix format because they suggest that enhanced accuracy did not come at the cost of increased time, greater task difficulty or less confidence in the outcome. Moreover, had the subjects been equally familiar with the two

formats, our results might well have pointed to further benefits of changing to the matrix format.

Insert Table 8 about here

COMPETENCY was a significant variable in each of the ANOVAs for EASE and CONFIDENCE but only had borderline significance for TIME ($F = 2.871$, $p = 0.091$). COMPETENCY and TIME were not significantly correlated for any of the three groups, but were positively correlated for all subjects ($r = 0.125$, $p = 0.006$). EASE was significantly positively correlated with COMPETENCY overall ($r = 0.388$, $p < 0.001$), for both the analysts ($r = 0.207$, $p = 0.007$) and the accountants ($r = 0.196$, $p = 0.042$) but only at the 10% level for the MBA students ($r = 0.133$, $p = 0.062$). CONFIDENCE was significantly positively correlated with COMPETENCY for all subjects overall ($r = 0.465$, $p < 0.001$) and for the analysts ($r = 0.242$, $p = 0.002$), accountants ($r = 0.368$, $p < 0.001$) and the MBA students ($r = 0.266$, $p = 0.001$). More competent subjects found the task easier, were more confident about their accuracy and completed the task faster. In addition, as expected, there were differences between the three groups in time taken and in subjects' views about ease and confidence in relation to the task.

6. Summary and Conclusions

This study aims to investigate the potential benefits to financial statement users of a matrix format for reporting comprehensive income, as developed by the IASB and UK ASB over the period 2001-2003. The matrix has two key display features: first, it is a single statement of comprehensive income and second, it reports a line-by-line disaggregation of the statement items into remeasurements and before remeasurements.

Presentation of income statement items is of key interest to both financial statement users and preparers. Little is known about the direct effect on users' ability to extract information when a format such as the matrix is used. Our experiment provides such evidence, and thus it provides empirical evidence relevant to standard setters and those working with financial statements.

The experiment involved 477 subjects, including financial analysts and accountants (as being representative of sophisticated financial statement users) and MBA students (as being representative of less sophisticated financial statement users). Subjects were required to complete a financial analysis exercise using a set of financial statements that either included an income statement and a statement of changes in equity in the 2005 IAS 1 format or an income statement based on the matrix format. After controlling for subjects' competency levels, results show that the matrix format improves the accuracy with which users extract financial information for both sophisticated and less sophisticated financial statement users and that the relative impact of the matrix format is greatest for the less sophisticated users. The improvement in accuracy relates to below-the-line remeasurement items (i.e., items taken directly to equity). It may arise from greater transparency resulting from including the below-the-line items in the income statement, displaying the items in the columnar format, or both.

The policy implication of the results is that standard setters have little reason to fear users will make more errors when extracting information from a single statement of comprehensive income, compared to financial statements prepared according to IAS 1. Furthermore, we find that despite users' unfamiliarity with the matrix format, they did not take longer in their analysis, they did not consider the matrix format more difficult to use and they did not have less confidence in their answers. Moreover, we might reasonably expect significant improvements along these dimensions as well, as users gained more experience with the matrix format. Our findings suggest that adopting the matrix format would not pose a major educational challenge, at least when it comes to financial analysts, accountants and managers.

Our experiment is a useful starting point for evaluating a matrix format for the reporting of comprehensive income. The methodology used could be applied to investigate the understandability of other issues related to financial statement presentation, such as alternative methods of reporting comprehensive income components and their recycling. Future studies could explore how various elements of the matrix (that is, the one page presentation, the multiple columns and the prohibition on recycling) affect the increased accuracy observed for the matrix. We have considered the accuracy of data extraction as a precursor to investigating whether financial statement users find the matrix format more useful for decision making. Further issues to be addressed include whether a single income statement will affect investors' perceptions of risk, or whether an improved ability to extract information on remeasurements will result in better outcomes in contexts such as risk assessment, forecasts of future financial performance and the valuation of the firm.

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Table 1. *Descriptive Statistics of Subjects*

	Analysts	Accountants	MBA students	F	P
Number	168	110	199		
Male	90%	64%	69%		
Female	10%	36%	31%		
Work Experience (average years)	11.5	12.1	10.3	2.029	0.113
Professional Experience (average years)	7.3	11.5	NA		
Version					
IAS 1	48%	51%	49%		
MATRIX	52%	49%	51%		

This table shows details of number of subjects, gender, work and professional experience and the proportion completing each version of the experimental instrument (IAS 1 or MATRIX) for three groups of financial statement users – analysts and accountants (sophisticated users) and less sophisticated users (as proxied by MBA students).

Table 2. *Descriptive Statistics of Accuracy and Competency Scores*

Panel A: Accuracy scores

	Analysts	Accountants	MBA students	F	P
Mean	54.95%	58.67%	28.80%	143.70	< 0.001
Median	53.85%	61.54%	23.08%		
Standard Deviation	17.44%	18.22%	17.06%		
Maximum	92.31%	92.31%	76.92%		
Minimum	7.69%	7.69%	0.00%		

Panel B: Competency scores

	Analysts	Accountants	MBA students	F	P
Mean	85.60%	88.00%	58.74%	159.18	< 0.001
Median	90.00%	90.00%	60.00%		
Standard Deviation	14.51%	14.51%	21.41%		
Maximum	100.00%	100.00%	100.00%		
Minimum	30.00%	30.00%	10.00%		

Panel A shows subjects' accuracy scores for 13 questions about remeasurement of financial statement items for three groups of financial statement users – analysts and accountants (sophisticated users) and less sophisticated users (as proxied by MBA students). Panel B shows subjects' accuracy scores for ten questions designed to test competency in extracting financial information.

Table 3. *Financial analysts: Analysis of Accuracy by Version and Question Type*

Panel A: Mean [Median] (Standard Deviation) Accuracy Rates (%)			
	Version		
Type	IAS 1	MATRIX	All
Above-the-line	77.57	71.45	74.40
	[83.33]	[83.33]	[83.33]
	(20.94)	(22.43)	(21.88)
	n = 81	n = 87	n = 168
Below-the-line	28.92	46.96	38.27
	[28.57]	[42.86]	[42.86]
	(21.42)	(19.84)	(22.46)
	n = 81	n = 87	n = 168
All	51.38	58.27	
	[53.85]	[61.54]	
	(17.53)	(16.78)	
	n = 81	n = 87	

Panel B: Analysis of Variance			
Factor	Df	F	p
Between Subjects			
Version	1	11.543	0.001
Within Subjects			
Type	1	314.461	< 0.001
Covariate			
Competency	1	86.423	< 0.001
Interactions			
Version: Type	1	34.295	< 0.001
(Adjusted R Squared = 0.564)			

Panel C: Comparison of Means		t	p
Above-the-line	IAS 1 versus MATRIX	1.823	0.070
Below-the-line	IAS 1 versus MATRIX	5.666	< 0.001
All	IAS 1 versus MATRIX	2.602	0.010
IAS 1	Above versus Below-the-line	18.305	< 0.001
MATRIX	Above versus Below-the-line	8.932	< 0.001
All	Above versus Below-the-line	17.020	< 0.001

Panel A shows financial analysts' accuracy rates for above-the-line (included in the IAS 1 income statement), below-the-line (not included in the IAS 1 income statement) and all comprehensive income questions for all financial analysts across the IAS 1 and MATRIX versions of the financial statements. Panel B presents the results of an analysis of variance where version (IAS 1 or MATRIX) varies between subjects and question type (TYPE above-the-line or below-the-line) varies for each participant. Subjects' scores on ten competency questions is a control variable (covariate). Interaction variables between version and question type are also reported. Panel C reports t-tests of comparisons of means: firstly between versions (IAS 1 or MATRIX) for above-the-line, below-the-line and all comprehensive income items; and secondly for above and below-the-line items across the differing reporting formats and overall.

Table 4. *Accountants: Analysis of Accuracy by Version and Question Type*

Panel A: Mean [Median] (Standard Deviation) Accuracy Rates (%)			
	Version		
Type	IAS 1	MATRIX	All
Above-the-line	76.19	77.47	76.82
	[83.33]	[83.33]	[83.33]
	(21.52)	(20.26)	(20.83)
	n = 56	n = 54	n = 110
Below-the-line	33.93	52.65	43.12
	[28.57]	[57.14]	[42.86]
	(23.04)	(18.78)	(22.98)
	n = 56	n = 54	n = 110
All	53.43	64.10	
	[53.85]	[69.23]	
	(18.69)	(16.16)	
	n = 56	n = 54	

Panel B: Analysis of Variance			
Factor	Df	F	P
Between Subjects			
Version	1	6.926	0.009
Within Subjects			
Type	1	167.237	< 0.001
Covariate			
Competency	1	48.642	< 0.001
Interactions			
Version x Type	1	11.582	0.001
(Adjusted R Squared = 0.528)			

Panel C: Comparison of Means		*t*	*p*
Above-the-line	IAS 1 versus MATRIX	0.321	0.779
Below-the-line	IAS 1 versus MATRIX	4.677	< 0.001
All	IAS 1 versus MATRIX	3.197	0.002
IAS 1	Above- versus Below-the-line	12.861	< 0.001
MATRIX	Above- versus Below-the-line	8.364	< 0.001
All	Above- versus Below-the-line	14.275	< 0.001

Panel A shows accountants' accuracy rates for above-the-line (included in the IAS 1 income statement), below-the-line (not included in the IAS 1 income statement) and all comprehensive income questions for all accountants across the IAS 1 and MATRIX versions of the financial statements. Panel B presents the results of an analysis of variance where version (IAS 1 or MATRIX) varies between subjects and question type (TYPE above-the-line or below-the-line) varies for each participant. Subjects' scores on ten competency questions is a control variable (covariate). Interaction variables between version and question type are also reported. Panel C reports t-tests of comparisons of means: firstly between versions (IAS 1 or MATRIX) for above-the-line, below-the-line and all comprehensive income items; and secondly for above and below-the-line items across the differing reporting formats and overall.

Table 5. *MBA Students: Analysis of Accuracy by Version and Question Type*

Panel A: Mean [Median] (Standard Deviation) Accuracy Rates (%)			
	Version		
Type	IAS 1	MATRIX	All
Above-the-line	37.76	37.62	37.69
	[33.33]	[33.33]	[33.33]
	(22.26)	(25.35)	(23.82)
	n = 98	n = 101	n = 199
Below-the-line	12.98	29.14	21.18
	[14.29]	[28.57]	[14.29]
	(13.15)	(20.19)	(18.88)
	n = 98	n = 101	n = 199
All	24.41	33.05	
	[23.08]	[30.77]	
	(14.66)	(18.19)	
	n = 98	n = 101	

Panel B: Analysis of Variance			
Factor	Df	F	p
Between Subjects			
Version	1	20.100	< 0.001
Within Subjects			
Type	1	76.061	< 0.001
Covariate			
Competency	1	73.411	< 0.001
Interactions			
Version x Type	1	20.984	< 0.001
(Adjusted R Squared = 0.315)			

Panel C: Comparison of Means		*t*	*p*
Above-the-line	IAS 1 versus MATRIX	0.039	0.969
Below-the-line	IAS 1 versus MATRIX	6.710	< 0.001
All	IAS 1 versus MATRIX	3.696	< 0.001
IAS 1	Above- versus Below-the-line	11.816	< 0.001
MATRIX	Above- versus Below-the-line	3.123	0.002
All	Above- versus Below-the-line	9.104	< 0.001

Panel A shows MBA students' accuracy rates for above-the-line (included in the IAS 1 income statement), below-the-line (not included in the IAS 1 income statement) and all comprehensive income questions for all MBA students across the IAS 1 and MATRIX versions of the financial statements. Panel B presents the results of an analysis of variance where version (IAS 1 or MATRIX) varies between subjects and question type (TYPE above-the-line or below-the-line) varies for each participant. Subjects' scores on ten competency questions is a control variable (covariate). Interaction variables between version and question type are also reported. Panel C reports t-tests of comparisons of means: firstly between versions (IAS 1 or MATRIX) for above-the-line, below-the-line and all comprehensive income items; and secondly for above and below-the-line items across the differing reporting formats and overall.

Table 6. *Analysis of Incremental Accuracy* by Version and Sophistication*

Panel A: Mean [Median] (Standard Deviation) Above-the line less Below-the-line (%)		
	Version	
Type	IAS 1	MATRIX
Sophisticated users	46.04	24.62
Analysts (n = 168)	[50.00]	[26.19]
Accountants (n = 110)	(24.31)	(24.13)
	n = 137	n = 141
Less sophisticated users	24.78	8.49
MBA students (n = 199)	[21.43]	[7.14]
	(20.76)	(27.31)
	n = 98	n = 101

Panel B: Analysis of Variance			
Factor	Df	F	p
Between Subjects			
Version	1	72.829	< 0.001
Sophistication	1	19.531	< 0.001
Covariate			
Competency	1	13.202	< 0.001
Interactions			
Version x Sophistication	1	1.424	0.233
(Adjusted R Squared = 0.250)			

Panel C: Comparison of Means			
		t	*p*
Sophisticated	IAS 1 versus MATRIX	7.373	< 0.001
Less sophisticated	IAS 1 versus MATRIX	4.728	< 0.001
IAS 1	Sophisticated versus Less sophisticated	7.016	< 0.001
MATRIX	Sophisticated versus Less sophisticated	4.854	< 0.001

* Incremental Accuracy = Above-the line accuracy minus Below-the-line accuracy. Panel A shows subjects' first difference in accuracy rates for above-the-line items compared to below-the line items for all subjects across the IAS 1 and MATRIX versions of the financial statements. Subjects are partitioned into Sophisticated users (analysts and accountants) and Less sophisticated users (MBA students). Panel B presents the results of an analysis of variance where version (IAS 1 or MATRIX) varies between subjects and sophistication (Sophisticated or Less sophisticated) varies for each subject. Subjects' scores on the ten competency questions is a control variable (covariate). The interaction between version and sophistication is also reported. Panel C reports t-tests of comparisons of means: firstly between versions (IAS 1 or MATRIX) for Sophisticated and Less sophisticated users; and secondly for the different levels of sophistication within the differing reporting formats.

Table 7. *Below-the-line Accuracy Rates by Version – Recycled and Non-recycled Items*

	IAS 1	Matrix	t	p
Analysts				
Recycling	10.29	28.35	4.983	< 0.001
Non-recycling	42.90	60.92	4.297	< 0.001
(t statistic, p)	(9.921, < 0.001)	(9.519, < 0.001)		
Accountants				
Recycling	17.26	25.92	1.808	0.073
Non-recycling	46.43	72.69	5.374	< 0.001
(t statistic, p)	(7.607, < 0.001)	(11.971, < 0.001)		
MBAs				
Recycling	4.76	24.09	6.804	< 0.001
Non-recycling	19.13	32.92	4.046	< 0.001
(t statistic, p)	(5.491, < 0.001)	(2.701, 0.008)		

This table compares accuracy for the three below-the-line recycling and four below-the-line non-recycling questions across versions (IAS 1 and MATRIX) and groups (analysts, accountants and MBA students).

Table 8. *Analysis of Time, Ease and Confidence Measures*

Panel A: Performance measures (means)					
	Analysts	Accountants	MBAs	F	p
Time (minutes)					
IAS1	32.69	26.95	27.93	7.164	0.001
Matrix	36.94	23.72	25.86	13.013	< 0.001
All	34.89	25.36	26.87	18.846	< 0.001
Ease of task (0 to 10 scale)					
IAS1	4.52	5.38	2.95	34.794	< 0.001
Matrix	4.48	5.40	3.20	29.916	< 0.001
All	4.50	5.39	3.08	63.693	< 0.001
Confidence (0 to 10 scale)					
IAS1	5.30	6.36	3.47	31.35	< 0.001
Matrix	4.90	6.93	3.39	54.25	< 0.001
All	5.09	6.64	3.43	80.738	< 0.001

Panel B: Analysis of Variance

		Time		Ease		Confidence	
Factor	Df	F	Sig	F	sig	F	sig
Between Subjects							
Version	1	0.000	0.990	2.261	0.133	0.571	0.450
Group	2	7.231	0.001	11.857	< 0.001	11.325	< 0.001
Laboratory	1	0.157	0.692	1.200	0.274	2.915	0.088
Covariate							
Competency	1	2.871	0.091	11.265	< 0.001	29.947	< 0.001
Interactions							
Version: Group	2	0.117	0.889	0.032	0.969	0.444	0.642
Version: Lab	1	0.544	0.461	0.952	0.330	1.751	0.180
Group: Lab	2	0.060	0.942	1.256	0.286	0.487	0.615
Group: Lab: Version	2	1.354	0.259	1.060	0.347	1.521	0.220
Adjusted R Squared		0.075		0.240		0.308	

Panel A shows time (how many minutes subjects took to complete Question Set 2); ease (how easy they found it to extract the required information 0 to 10 scale, 'not at all easy' to 'very easy'); and confidence (how confident they were that they had answered at least 70% of the questions correctly 0 to 10 scale, 'not at all confident' to 'very confident') and reports differences in means between the groups. Panel B shows the results of ANOVAs with the time to complete, ease of completion and confidence in results as the dependent variables, competency (subject's score for ten questions designed to measure competency in extracting information from financial statements) as a covariate and version (IAS 1 or MATRIX), group (analyst, accountant or MBA student) and lab (method of data collection by either mail or in a laboratory setting) as between subject variables.

Appendix A
Income Statement Formats

Subjects were provided with complete financial statements comprising: Income Statement; Balance Sheet; Statement of Changes in Stockholders' Equity; Statement of Cash Flows; and Notes to Accompany the Financial Statements. Only the alternative Income Statements are provided below.

IAS 1 FORMAT

ABC plc Income Statement
for the year ended 30 June 2005

	Notes	2005 £000	2004 £000
Revenue		1260	1180
Cost of sales		(685)	(730)
Gross profit		575	440
Other income		57	65
Selling and administrative expenses		(380)	(290)
Goodwill impairment		(100)	
Net Financing costs		(5)	(30)
Profit before income tax	2	147	185
Income tax expense	3	(30)	(60)
Profit for the year		117	125

MATRIX (IAS 1 financial statements with matrix format income statement)

STU plc Income Statement
for the year ended 30 June 2005

	Notes	Total	Profit other than remeasurements	Remeasurements
		£000	£000	£000
Revenue		1260	1260	
Cost of sales		(725)	(715)	(10)
Selling and administrative expenses		(380)	(370)	(10)
Operating profit	2	155	175	(20)
Held for trading investments		2		2
Land revaluation		65		65
Gain on disposal of property, plant and equipment		40		40
Goodwill		(100)		(100)
Other business profit		7		7
Available for sale investments		(35)		(35)
Interest income		15	15	
Interest on liabilities		(20)	(20)	
Foreign currency translation		50	50	
Tax	3	(55)	(55)	
Financing and investing		(45)	(10)	(35)
Cash flow hedges		55		55
Profit for the year		172	165	7

The two profit figures can be reconciled as follows:

117 Profit under IAS 1
+65 Land revaluation taken to equity via Statement of Changes in Stockholders Equity (SCE)
-35 Available-for-sale investments valuation loss taken to equity via SCE
-15 Available-for-sale investments recycled to income in IAS 1 but already recognised as income in MATRIX in year of fair value change
+55 Cash flow hedges gain taken to equity via SCE
-40 Cash flow hedges gain recycled to income in IAS 1 but already recognised as income in MATRIX in year of fair value change
+ 50 Foreign currency translation taken to equity via SCE
-25 Tax on items taken directly to equity
172 Profit under Matrix Format

Appendix B
Case Study Questions

Question Set 2 comprises the following 23 questions for all subjects. CY = Competency; CI = Comprehensive income question

Inventory

1CY	What was the increase/(decrease) in inventory for the year ended 30 June 2005?	£_____
2CI	What would be the closing balance of inventory at 30 June 2005 if there had been no impairment?	£_____

Held for trading investments

3CY	Held for trading investments and available for sale investments are stated at fair value with any resultant gain or loss being recognised in profit for the year.	TRUE FALSE
4CI	Were there any sales of held for trading investments during the year ended 30 June 2005?	YES NO
5CI	How much profit/(loss) is recognised for the year ended 30 June 2005 due to fair value adjustments relating to held for trading investments?	£_____

Property, plant and equipment

6CY	What were the proceeds from the sale of property, plant and equipment for the year ended 30 June 2005?	£_____
7CI	What was the increase/(decrease) in profit for the year ended 30 June 2005 as a result of the above sale(s)?	£_____

Goodwill

8CY	What was the increase/(decrease) in goodwill for the year ended 30 June 2005?	£_____
9CI	Was the above amount included in profit for the year ended 30 June 2005?	YES NO

Employee entitlements

10CY	By how much did the long term provision for employee benefits increase/(decrease) for the year ended 30 June 2005?	£_____
11CI	By how much did the long term provision for employee benefits increase/(decrease) for the year ended 30 June 2005 due to the remeasurement of an existing long term obligation?	£_____

Translation of foreign currencies

12CY	For the year ended 30 June 2005 the assets and liabilities of the company's foreign operations are translated into GBP (pounds sterling) at average exchange rates prevailing during the period.	TRUE FALSE
13CI	For the year ended 30 June 2005 what was the increase/(decrease) in profit due to foreign currency translation adjustments?	£_____
14CI	For the year ended 30 June 2005 what was the increase/(decrease) in net assets because of foreign currency translation adjustments?	£_____

Available for sale investments

15CY	Are available for sale investments recognised in the balance sheet at fair value or cost?	FAIR VALUE COST
	2003/04	
16CI	How much profit/(loss) is recognised for the year ended 30 June 2004 for changes in fair value of available for sale investments that occurred in earlier years?	£_____
17CI	How much profit/(loss) is recognised for the year ended 30 June 2004 for changes in fair value of available for sale investments that occurred at any time during that financial year?	£_____
18CI	What was the increase/(decrease) in fair value of available for sale investments held at any time during the year ended 30 June 2004?	£_____
	2004/05	
19CY	What was the increase/(decrease) in available for sale investments for the year ended 30 June 2005?	£_____
20CI	How much profit/(loss) is recognised for the year ended 30 June 2005 due to fair value adjustments relating to available for sale investments?	£_____
21CY	How much was spent purchasing available for sale investments during the year ended 30 June 2005?	£_____
22CY	What were the proceeds from disposals of available for sale investments for the year ended 30 June 2005?	£_____
23CI	What was the increase/(decrease) in fair value of available for sale investments held at any time during the year ended 30 June 2005?	£_____

Notes

[1] The CFA Institute (2007) has proposed a presentation in which remeasurements are further disaggregated into "current period accrual transactions" and "estimates".

[2] Recycling occurs when an asset is sold for which fair value changes were previously recognized directly in equity. On sale of the asset, the gain (loss) is removed from equity and included in the determination of net income for the year, then returned to equity via current year income.

[3] Other arguments against reporting a single income statement relate to it being "not useful", typically because of the volatility of dirty surplus items (King *et al.* 1999).

[4] Notwithstanding informational efficiency in the market, where financial contracts are framed in terms of reported financial statement items, presentation of the information in financial statements could, at least in a single period setting, be of crucial importance.

[5] The Hirst and Hopkins' (1998) experiment was conducted around the time of the introduction of SFAS 130, when analysts would have been relatively unfamiliar with the presentation format of a single statement of comprehensive income. Their experiment does not control for the possibility that analysts expended more cognitive effort on the 'new' presentation format compared to the familiar format (display of comprehensive income items in the statement of changes in equity).

[6] Participants in all countries except the USA were given IAS-based financial statements denominated in pounds. For Japanese participants, the financial statements and questions were translated into Japanese by a professional translator and checked by an experienced securities analyst. For participants in the USA, the IAS-based financial statements were reformatted to comply with US GAAP by removing the land revaluation item, but otherwise retaining the same items and presentation format. The US GAAP version was checked by an experienced US based securities analyst.

[7] To protect against bias from a set question order, two versions of the second booklet were developed for each of IAS 1 and MATRIX. The booklets contained the same questions but presented them in a different sequence.

[8] Although questions about cash flow hedges and pensions were considered, separate questions were not asked on these items for two reasons. First, the focus was unrealized gains or losses on available-for-sale investments because this item has been the focus of prior research. Second, in the case of cash flow hedges, the process of recycling which can be applied under IAS 1 is similar to that for available-for-sale investments and, in the case of pensions, the questions would have been similar to those for employee entitlements. Pre-

testing confirmed this. Therefore including questions on cash flow hedges and pensions would have increased subjects' time taken to complete the experiment without adding to the scope of the data generated by the experiment.

[9] MBA students were enrolled as follows: in the USA, at the Colorado State University; in Australia and Singapore, at the University of Western Australia; in New Zealand, at Victoria University of Wellington and Massey University.

[10] The test statistic reported is the Brown-Forsythe asymptotically distributed F and in the post hoc tests the Tanhames T2.

[11] Pearson correlations were 0.534 ($p < 0.001$) for financial analysts, 0.536 ($p < 0.001$) for accountants, and 0.457 ($p < 0.001$) for MBA students.

[12] Recognising that the level of covariance of COMPETENCE and GROUP could affect the results, an ANOVA excluding COMPETENCE was calculated. The results are qualitatively the same whether competence is included or excluded.

[13] One exception is in relation to the accountants. When we exclude New Zealand (source of 85 out of 110 subjects) the ANOVA for the other 25 participants gives inconclusive results as version and version/type interaction are not significant.

[14] A series of ANOVAs showed that differences in experimental environment, question order and amount of work experience were not significant explanatory variables. Experimental environment (supervised or unsupervised) had an insignificant main effect ($F = 0.008$, $p = 0.928$) and insignificant interactions with all other variables (version, group and above/below). Question order had an insignificant main effect ($F = 2.556$, $p = 0.110$) and insignificant interactions with all other variables (version, group and above/below). Work experience had an insignificant effect ($F = 0.301$, $p = 0.584$).

[15] Non-parametric tests on Panel C data in Tables 2, 3 and 4 generally allow the same conclusions as reported here. However, in relation to differences in accuracy for the above-the-line questions, the Mann Whitney test reports a non-significant statistic with value of $p = 0.115$.

[16] Consistent results are found for a comparison of analysts and MBA students and for accountants and MBA students.

[17] Except for impairment losses and foreign exchange gains and losses.

[18] The answers to the questions about BTL non-recycling items could be found by a one-stage process, that is, the answer could be read directly from one place in the financial statements. In contrast, the BTL recycling answers involved a two-stage process. Subjects

would need to identify at least two items of information located in two or more locations in the financial statements and reconcile the difference.

[19] The Mann Whitney test was significant ($Z = 2.427$, $p = 0.015$).

[20] LAB was included to control for any experimental bias resulting from different methods of collecting data.