An Empirical Investigation of the Comparability of Reported Earnings Per Share Under Accounting Principles Board Opinion No. 15.

Suzanne Resi Pinac-ward
Louisiana State University and Agricultural & Mechanical College

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AN EMPIRICAL INVESTIGATION OF THE COMPARABILITY OF REPORTED EARNINGS PER SHARE UNDER ACCOUNTING PRINCIPLES BOARD OPINION NO. 15

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in

The Department Of Accounting

by

Suzanne Resi Pinac-Ward
B.S., Louisiana Tech University, 1974
M.S., Louisiana State University, 1976
December, 1986
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This dissertation is dedicated to my father, Andre' L. Pinac, Jr.;
to my grandfather, Gillis J. LeDet; and, especially to my husband,
Dr. Dan R. Ward.
<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>ix</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>APB 15: Major Computational Conflicts</td>
<td>3</td>
</tr>
<tr>
<td>Research Objectives</td>
<td>8</td>
</tr>
<tr>
<td>Research Hypotheses</td>
<td>9</td>
</tr>
<tr>
<td>Methodology</td>
<td>11</td>
</tr>
<tr>
<td>Relevancy of the Issues</td>
<td>12</td>
</tr>
<tr>
<td>Organization of the Study</td>
<td>15</td>
</tr>
<tr>
<td>II. EPS: AN HISTORICAL PERSPECTIVE</td>
<td>16</td>
</tr>
<tr>
<td>Development of EPS GAAP</td>
<td>16</td>
</tr>
<tr>
<td>EPS GAAP Prior to APB 15</td>
<td>16</td>
</tr>
<tr>
<td>APB 15</td>
<td>18</td>
</tr>
<tr>
<td>Unofficial Interpretations of APB 15</td>
<td>22</td>
</tr>
<tr>
<td>Refinements to EPS GAAP</td>
<td>23</td>
</tr>
<tr>
<td>Overview of Selected EPS Literature</td>
<td>24</td>
</tr>
<tr>
<td>Analytical Literature</td>
<td>25</td>
</tr>
<tr>
<td>General Criticisms of APB 15</td>
<td>25</td>
</tr>
<tr>
<td>Alternative Proposals for Reporting EPS</td>
<td>26</td>
</tr>
<tr>
<td>Empirical Literature</td>
<td>28</td>
</tr>
<tr>
<td>Studies of CSE Status</td>
<td>28</td>
</tr>
<tr>
<td>Usefulness of EPS</td>
<td>30</td>
</tr>
<tr>
<td>Summary</td>
<td>34</td>
</tr>
<tr>
<td>III. APB 15: COMPUTATIONAL PROVISIONS AND INTERPRETATIONS</td>
<td>36</td>
</tr>
<tr>
<td>Selected Computational Provisions of APB 15</td>
<td>36</td>
</tr>
<tr>
<td>3 Percent Materiality Provision</td>
<td>37</td>
</tr>
<tr>
<td>Future Expectations Exception</td>
<td>40</td>
</tr>
<tr>
<td>No Anti-Dilutive Security Provision</td>
<td>40</td>
</tr>
<tr>
<td>iv</td>
<td></td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Warrant/Option Dilution Determination Provision</td>
<td>43</td>
</tr>
<tr>
<td>Recap</td>
<td>48</td>
</tr>
<tr>
<td>Interpretational Guides to APB 15</td>
<td>49</td>
</tr>
<tr>
<td>Textbook Approaches to EPS Computations</td>
<td>54</td>
</tr>
<tr>
<td>Kieso/Weygandt Series</td>
<td>57</td>
</tr>
<tr>
<td>Welsch, et al, Series</td>
<td>58</td>
</tr>
<tr>
<td>Meigs/Mosich, et al, Series</td>
<td>59</td>
</tr>
<tr>
<td>EPS Signal From Management</td>
<td>60</td>
</tr>
<tr>
<td>Signalling Theory</td>
<td>61</td>
</tr>
<tr>
<td>False Signalling Possibilities</td>
<td>62</td>
</tr>
<tr>
<td>Summary</td>
<td>64</td>
</tr>
<tr>
<td>IV. METHODOLOGY</td>
<td>66</td>
</tr>
<tr>
<td>Research Hypotheses</td>
<td>66</td>
</tr>
<tr>
<td>Subjects</td>
<td>68</td>
</tr>
<tr>
<td>Focal Population</td>
<td>68</td>
</tr>
<tr>
<td>Accountants</td>
<td>68</td>
</tr>
<tr>
<td>Preparers of EPS</td>
<td>70</td>
</tr>
<tr>
<td>Sample</td>
<td>73</td>
</tr>
<tr>
<td>Sample Size</td>
<td>73</td>
</tr>
<tr>
<td>Sample Selection</td>
<td>75</td>
</tr>
<tr>
<td>Measurement Instrument</td>
<td>76</td>
</tr>
<tr>
<td>General Overview of Instrument</td>
<td>77</td>
</tr>
<tr>
<td>Task</td>
<td>78</td>
</tr>
<tr>
<td>Cases</td>
<td>79</td>
</tr>
<tr>
<td>Case 1</td>
<td>79</td>
</tr>
<tr>
<td>Case 2</td>
<td>82</td>
</tr>
<tr>
<td>Case 3</td>
<td>85</td>
</tr>
<tr>
<td>Case 4</td>
<td>87</td>
</tr>
<tr>
<td>Determination of Target EPS</td>
<td>90</td>
</tr>
<tr>
<td>Pretest of Instrument</td>
<td>91</td>
</tr>
<tr>
<td>Non-Response Bias</td>
<td>91</td>
</tr>
<tr>
<td>Mailing Procedures</td>
<td>92</td>
</tr>
<tr>
<td>Time Frame of Study</td>
<td>92</td>
</tr>
<tr>
<td>Response Improvement Techniques</td>
<td>93</td>
</tr>
<tr>
<td>Summary</td>
<td>95</td>
</tr>
<tr>
<td>V. DATA ANALYSIS AND EMPIRICAL RESULTS</td>
<td>97</td>
</tr>
<tr>
<td>Response</td>
<td>97</td>
</tr>
<tr>
<td>Data Reliability</td>
<td>102</td>
</tr>
<tr>
<td>Statistical Analysis of the Hypotheses</td>
<td>105</td>
</tr>
<tr>
<td>Tests of Assumptions of the Expression</td>
<td>106</td>
</tr>
<tr>
<td>Case Analysis</td>
<td>107</td>
</tr>
<tr>
<td>Case 1</td>
<td>107</td>
</tr>
<tr>
<td>Case 2</td>
<td>108</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Case 3</td>
<td>109</td>
</tr>
<tr>
<td>Case 4</td>
<td>111</td>
</tr>
<tr>
<td>Case Comparisons</td>
<td>113</td>
</tr>
<tr>
<td>Demographics</td>
<td>114</td>
</tr>
<tr>
<td>Tests for Non-Response Bias</td>
<td>119</td>
</tr>
<tr>
<td>Summary of Results</td>
<td>120</td>
</tr>
<tr>
<td>VI. SUMMARY AND CONCLUSIONS</td>
<td>122</td>
</tr>
<tr>
<td>Summary</td>
<td>122</td>
</tr>
<tr>
<td>Implications</td>
<td>125</td>
</tr>
<tr>
<td>Limitations</td>
<td>127</td>
</tr>
<tr>
<td>Future Research</td>
<td>128</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>131</td>
</tr>
<tr>
<td>APPENDIX</td>
<td></td>
</tr>
<tr>
<td>A. Advance Letter and Postcard for First Mailing</td>
<td>143</td>
</tr>
<tr>
<td>B. Case 1 - 3 Percent Materiality Provision</td>
<td>146</td>
</tr>
<tr>
<td>C. Case 2 - Future Expectation Exception to the 3 Percent Materiality Provision</td>
<td>148</td>
</tr>
<tr>
<td>D. Case 3 - No Anti-Dilutive Security Provision</td>
<td>150</td>
</tr>
<tr>
<td>E. Case 4 - Warrant/Option Dilution Determination Provision</td>
<td>152</td>
</tr>
<tr>
<td>F. Cover Letter to Additional Preparers in Second Mailing</td>
<td>154</td>
</tr>
<tr>
<td>G. Cover Letter to Identified/Implied Preparers in the Second Mailing</td>
<td>156</td>
</tr>
<tr>
<td>H. Demographic Section of Questionnaire</td>
<td>158</td>
</tr>
<tr>
<td>VITA</td>
<td>161</td>
</tr>
<tr>
<td>Table</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1. Reported EPS for Examples</td>
<td>50</td>
</tr>
<tr>
<td>2. Calculated PEPS for Examples</td>
<td>50</td>
</tr>
<tr>
<td>3. Initial Mailing</td>
<td>98</td>
</tr>
<tr>
<td>4. Postcard Responses</td>
<td>99</td>
</tr>
<tr>
<td>5. Questionnaire Responses</td>
<td>101</td>
</tr>
<tr>
<td>6. Data Reliability</td>
<td>105</td>
</tr>
<tr>
<td>7. Results - 3 Percent Materiality Provision</td>
<td>108</td>
</tr>
<tr>
<td>8. Interpretation Comparison - 3 Percent Materiality Provision</td>
<td>108</td>
</tr>
<tr>
<td>9. Results - Future Expectation Exception</td>
<td>109</td>
</tr>
<tr>
<td>10. Results - No Anti-Dilutive Security Provision</td>
<td>110</td>
</tr>
<tr>
<td>11. Results - Warrant/Option Dilution Determination Provision</td>
<td>112</td>
</tr>
<tr>
<td>12. Education and EPS Experience of Respondents</td>
<td>115</td>
</tr>
<tr>
<td>13. Characteristics of CPAs</td>
<td>115</td>
</tr>
<tr>
<td>14. Characteristics of Corporate Accountants</td>
<td>117</td>
</tr>
<tr>
<td>15. Characteristics of Accounting Academicians</td>
<td>117</td>
</tr>
<tr>
<td>16. Ancillary Results - Type of Employment vs. PEPS Approach</td>
<td>119</td>
</tr>
<tr>
<td>17. Analysis of Early vs. Late Responses</td>
<td>120</td>
</tr>
<tr>
<td>18. Results of Hypotheses Testing</td>
<td>121</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Data from Case 1 of Test Instrument</td>
<td>38</td>
</tr>
<tr>
<td>2.</td>
<td>Aggregate vs. Sequential Approach</td>
<td>42</td>
</tr>
<tr>
<td>3.</td>
<td>Annual vs. Quarterly Technique</td>
<td>45</td>
</tr>
<tr>
<td>4.</td>
<td>Variations of Quarterly Technique</td>
<td>47</td>
</tr>
<tr>
<td>5.</td>
<td>Major Intermediate Accounting Textbooks</td>
<td>56</td>
</tr>
<tr>
<td>6.</td>
<td>Expression for Sample Size Determination</td>
<td>104</td>
</tr>
</tbody>
</table>
ABSTRACT

Earnings per share (EPS) is considered by many to be one of the most important summary indicators presented in the financial statements. Many financial statement users rely on EPS as the most important single measure of corporate performance. Previous empirical evidence suggests that a strong link exists between EPS changes and stock price changes.

The objective of this study was to determine if the provisions of APB 15 provide for consistent reporting of comparable EPS figures across preparers of financial statements. The application of alternative interpretations of provisions of APB 15 has the potential to produce materially different EPS figures. As a result, the degree of comparability of the reported EPS figures across companies is unclear.

The existence and application of alternative interpretations of four provisions of APB 15 were examined via a field study approach. Questionnaires were mailed to a random sample of preparers of EPS to elicit data concerning the following provisions: (1) the 3 percent materiality provision, (2) the future expectation exception to the 3 percent materiality provision, (3) the no anti-dilutive security provision, and (4) the warrant(option) dilution determination provision.

None of the three interpretations of the 3 percent materiality provision were favored over any of the other interpretations in the reporting of EPS. The application of the future expectation exception depended on the materiality of the expected dilution. The exception
was invoked when material future dilution was expected, but not when immaterial future dilution was expected.

The aggregate approach to the no anti-dilutive security provision was favored, but only for the calculation of PEPS. No one approach was favored for FDEPS computations. The opposite situation occurred for the warrant/option dilution determination provision. No technique was favored for the calculation of PEPS; however, utilization of year-end market prices was preferred for the FDEPS computations.

The results of this study indicate that, after almost 20 years, a set of consensus interpretations of the provisions of APB 15 has not yet been achieved. The findings imply that EPS reflects the preparer's individual interpretational approach rather than a uniform, consistent profession-wide approach. As a result, the comparability of the reported EPS figures across companies does not exist.
CHAPTER I

INTRODUCTION

Earnings per share (EPS) gives no indication of a company's debt position or its ability to raise capital. Even so, EPS may be the most important single measure of corporate performance used as a determinant of stock prices [Spacek, 1969]. Empirical evidence suggests that a strong link exists between EPS changes and stock price changes. [See, for example, Beaver and Landsman, 1983; Elton, Gruber, and Gultekin, 1981; Niederhoffer and Regan, 1972; Watts, 1977; Jones and Litzenberger, 1970; Brown, 1978; Downes and Dyckman, 1973; Gonedes, 1972, 1974; Ball and Brown, 1968.] In addition, EPS enables investors to more easily assess the past earnings performance of a company in relation to individual holdings or potential holdings [Parker and Cushing, 1971]. Davis [1984], for example, found that investors acted as if they were more interested in EPS than in cash flows.

Many users who are unable to interpret the complexities of the financial statements view EPS as the magic number [Seidler, 1972]. They assume that EPS is a precise, conclusive measurement rather than an informed, estimated abstract of reality [Bevis, 1966]. While EPS condenses complex and varied information to a single, seemingly simple statistic, considering EPS to be the all-encompassing answer to firm analysis can be both dangerous and misleading [Burger and Webster,
Users must recognize the limitations inherent in calculating EPS before formulating an opinion concerning a firm [APB, 1970].

Current guidelines for computing and reporting EPS are contained in Accounting Principles Board (APB) Opinion No. 15 *Earnings Per Share* (referred to hereafter as APB 15) which was issued in 1969. In drafting the Opinion, the APB considered the development of a uniform basis for computing and reporting EPS to be of paramount importance [APB, 1969, ¶2]. The rather elaborate provisions presented in APB 15 represent an attempt to provide such a uniform set of guidelines [APB, 1969, ¶3].

The computational guidelines outlined in APB 15 have not resolved all the computational issues, but rather have increased the complexities inherent in the EPS problem [APB, 1969]. Calculating the EPS figure is more complicated now than ever before [Greene, 1985]. Much of this complexity may be traced directly to the language used in the Opinion which is often vague and difficult to interpret. The APB's *Computing Earnings Per Share: Unofficial Accounting Interpretations of APB Opinion No. 15* (Ball, 1970) are nearly three times the length of the original Opinion. These interpretations represent a major attempt on the part of the APB to explain and clarify the original provisions of APB 15. Subsequent interpretations were issued by the APB in 1971 and by the Financial Accounting Standards Board (FASB) in 1978 and 1980. In addition, several interpretations of the EPS calculational rules have been tendered by various writers. [See, for example, Bird and Jones, 1970; Lorio, 1971; Matulich, Nikolai, and Olson, 1977; Stephens, 1978; Jolly, 1978; Stancill, 1982; Davidson and Weil, 1975; Kilpatrick, Putnam, and Schneider, 1985; Knauf, 1981.]
A number of writers have examined various aspects of APB 15 and called for abandonment or modification of the Opinion's provisions. For example, Boyer and Gibson [1979] examined comprehension of EPS by finance-oriented users and concluded that the concept of common stock equivalency is not well understood and that financial reporting only increases the problem. Flaherty and Schwartz [1980] examined the EPS disclosures of 195 companies with complex capital structures. Citing numerous examples of diverse terminology, vagueness, and less-than-full disclosure, they concluded that the "complexity and lack of specificity in the requirements of Opinion No. 15 may have led to diversity in application and to disclosures that are inadequate" [p. 47]. Rappaport [1981, p. 140] found that "alternative and equally acceptable determinations are possible for the EPS figure." Thus APB 15 may not have achieved the APB's objective of a uniform set of EPS guidelines.

**APB 15: Major Computational Conflicts**

A number of general provisions of APB 15 may require additional interpretation in practice, for example, (1) the 3 percent materiality provision [¶15], (2) the future expectation exception to the 3 percent materiality provision [¶17], (3) the no anti-dilutive security provision [¶30, ¶40], and (4) the warrant/option dilution determination provision [¶36, ¶42]. The above provisions are described and alternative interpretations noted in the following paragraphs.

APB 15 [footnote 2] states that "any reduction of less than 3% in the aggregate need not be considered as dilution in the computation and presentation of earnings per share..." Various interpretations of this provision are found in Ball [1970], Intermediate Accounting texts.
[e.g., Kieso and Weygandt, 1986; Mosich and Larsen, 1986], and CPA Examination review manuals [e.g., Delaney and Gleim, 1985; Bisk, 1985]. Two of the possible interpretations of the 3 percent materiality provision are discussed in the next paragraphs.

One accepted interpretation of the 3 percent materiality provision requires that Primary Earnings Per Share (PEPS)\(^1\) and Fully Diluted Earnings Per Share (FDEPS)\(^2\) each be examined individually to determine if the EPS figure under scrutiny is less than 97 percent of Simple Earnings Per Share (SEPS)\(^3\). In other words, PEPS and FDEPS must be individually analyzed and compared to SEPS to see if each reflects material dilution. Under this interpretation, if PEPS is within 3 percent of SEPS, then the provision allows a company to report the SEPS figure in place of the calculated PEPS figure. Examination of the material dilutive status of FDEPS is conducted separately. Simply because the calculated PEPS figure fails to reflect material dilution does not necessarily mean that the calculated FDEPS figure also fails to reflect material dilution [Ball, 1970, question 11]. Under this interpretation, if FDEPS reflects material dilution (i.e., dilution of

\(^{1}\)PEPS denotes the amount of earnings attributable to each share of common stock and common stock equivalents (CSE). A CSE is a "security which is not, in form, a common stock but which usually contains provisions to enable its holder to become a common stockholder and which, because of its terms and the circumstances under which it was issued, is in substance equivalent to a common stock" [APB, 1969, ¶25].

\(^{2}\)FDEPS reflects the current earnings per share assuming maximum dilution. Maximum dilution entails all dilution that would result from conversions and exercises that would individually and aggregately decrease EPS. Thus FDEPS is equal to or less than PEPS [APB, 1969, ¶40].

\(^{3}\)SEPS is calculated by dividing net income adjusted for preferred stock dividends by the weighted average number of common shares outstanding [APB, 1969, ¶14].
more than 3 percent), then the calculated FDEPS figure will be reported on the financial statements as FDEPS regardless of the materiality of the calculated PEPS figure. If, however, FDEPS is within 3 percent of SEPS, then PEPS must also be within 3 percent of SEPS. In this case, the company would be treated as if a simple capital structure existed and would report only the calculated SEPS figure on the financial statements.

An alternative interpretation of the 3 percent materiality provision frequently encountered in accounting textbooks and CPA exam review manuals applies the provision only to FDEPS. Under this interpretation, only one figure, FDEPS, is analyzed to determine if material dilution is reflected. The material dilutive status of the calculated PEPS figure is not examined for such a determination is not relevant under this interpretation. This interpretation, therefore, requires that, if FDEPS is less than or equal to 97 percent of SEPS, both calculated PEPS and calculated FDEPS be reported on the financial statements regardless of the materiality of the PEPS figure. If, however, FDEPS does not reflect material dilution, a simple capital structure is assumed and only the calculated SEPS figure need be reported on the financial statements.

4By only allowing consideration of dilutive effects, the APB forces FDEPS to be equal to or less than PEPS and PEPS to be equal to or less than SEPS [APB, 1969].

5A simple capital structure is one composed only of common stock and/or nonconvertible securities. A firm whose convertible securities dilute EPS by less than 3 percent is assumed to have a simple capital structure. By contrast, a firm with convertible securities is deemed to have a complex capital structure and must report both PEPS and FDEPS [APB, 1969, ¶14, ¶15].
Adding to the confusion surrounding application of the 3 percent materiality provision is the future expectation exception to the provision. This exception, set forth in the answer to Question 11 of the Unofficial Accounting Interpretations of APB 15 [Ball, 1970], allows the 3 percent materiality provision to be ignored based on future expectations of EPS dilution. According to the interpretation, if greater than 3 percent dilution is not expected in the next year, current EPS need not reflect greater than 3 percent dilution (and vice versa for less than 3 percent dilution).

Another aspect of EPS for which alternative interpretations have developed is the procedure for including dilutive securities in both PEPS and FDEPS. APB 15 [¶40] states that the "purpose of the fully diluted earnings per share presentation is to show the maximum potential dilution..." Securities whose "inclusion would have the effect of increasing the earnings per share amount otherwise computed" are to be excluded from the computation [¶30].

Two interpretations of the no anti-dilutive security provision have developed: (1) the aggregate approach, and (2) the sequential approach. The aggregate approach determines dilution on an individual security basis. All individually dilutive common stock equivalents (CSEs) are combined to calculate PEPS. All individually dilutive CSEs and other potentially dilutive securities (OPDSs) are then aggregated to compute FDEPS. In contrast, the sequential approach requires that all possible combinations of CSEs be considered in the PEPS calculation and all possible combinations of CSEs and OPDSs be considered in the FDEPS computation. The combination of CSEs which produces the lowest PEPS and the combination of CSEs and OPDSs which produces the lowest
FDEPS are then selected. Under this approach, the dilutive nature of a security is determined by the effect of securities previously included in the EPS calculation.

Both of the above approaches are found in accounting literature and in practice [Huefner, 1972]. Several intermediate textbooks illustrate the aggregate approach [Brenner, 1983; Williams, Stanga, and Holder, 1984], while others illustrate the sequential approach [Kieso and Weygandt, 1986; Chasten, Flaherty, and O'Connor, 1984; Welsch, Newman, and Zlatkovlch, 1986; Davidson, Hanouille, Stickney and Weil, 1985]. Mosich and Larsen [1986], on the other hand, do not illustrate either approach.

Multiple interpretations also exist for determining the dilution of warrants, options, etc. These securities are by definition CSEs [APB, 1969, ¶35] and therefore should be included in the calculation of EPS when dilutive. Options and warrants are dilutive when the market price exceeds the exercise price. For PEPS, the average market price for the period is used [¶36]; for FDEPS, the average or ending market price whichever is higher is used [¶42]. However, APB 15 is unclear as to whether quarterly or annual stock prices are to be utilized. In the example presented in APB 15, Appendix C, Exhibit B [APB, 1969], both approaches are utilized. Many intermediate accounting texts illustrate the annual technique [for example, Brenner, 1983; Kieso and Weygandt, 1986], while others illustrate the quarterly technique [see Chasten, Flaherty, and O'Connor, 1984; Davidson, Hanouille, Stickney and Weil, 1985]. One text, Mosich and Larsen [1986], illustrates the annual technique while explaining that APB 15 requires use of the quarterly technique.
Research Objectives

A summary indicator, such as EPS, should be relevant, reliable, and comparable across firms [Frishkoff, 1981]. Comparability increases the usefulness of financial reports by enhancing the relationship between two or more figures [FASB, 1980a]. Noncomparability across firms may arise because of measurer bias; i.e., accountants may follow different computational procedures and techniques due to their differing interpretations of required guidelines. As a result of this measurer bias, the verifiability and representational faithfulness (i.e., reliability) of the reported numbers are diminished [FASB, 1980a].

Interpretation of APB 15 generally rests with the accountant who is responsible for calculating the EPS figure. However, not all accountants may interpret the provisions of the Opinion in the same manner, thus producing computational variations. In light of the existence of multiple interpretations of major provisions of APB 15, a legitimate concern should exist regarding the comparability and the reliability of reported EPS figures. As a result, the following primary question is raised:

Do the provisions of APB Opinion No. 15 provide for consistent reporting of comparable EPS figures across preparers of financial statements?

Empirical criticisms of APB 15 suggest that the current technical standards for computing EPS may not reflect economic reality, but rather represent a group of arbitrary computational procedures. Thus, for EPS, accounting has perhaps abandoned the criterion of substance over form. Accordingly, two related secondary questions are also raised:
Has the accounting profession achieved the goal set forth by the APB of a uniform set of guidelines for calculating and disclosing EPS?

Has the accounting profession defined an adequate means of computing EPS?

**Research Hypotheses**

Consistent application of the provisions of APB 15 would indicate that the accounting profession has achieved a consensus concerning the calculation of EPS. Such a consensus would imply that the figure is both verifiable (i.e., capable of being replicated by different preparers) and comparable across firms [FASB, 1980a].

Alternatively, inconsistent application of the provisions of APB 15 would suggest that distorted signals are being provided to the investment community. The market reaction to these distorted signals may be entirely different from the reaction to EPS produced in strict accordance with APB 15 [Abdel-khalik, 1972]. Investors who rely on such distorted signals may have difficulty reconciling their knowledge about a firm and its environment with the firm's reported EPS figure [Hawkins, 1977]. The ensuing confusion in the securities market may result in the misallocation of resources in the economy [Chandra, 1974].

This study examined the computational and reporting requirements of APB 15 in order to assess the comparability of the reported EPS figure. This examination took place at the group level with preparers of EPS being viewed in the aggregate rather than at the individual preparer level with each preparer being examined separately. With this in mind, the following formal hypotheses, grouped by the provision of
APB 15 under examination, were investigated (stated in the alternative form):

3 Percent Materiality Provision

Hypothesis 1: Preparers of EPS favor at least one interpretation of the 3 percent materiality provision required by APB 15 [¶15] in reporting EPS on the financial statements.

Future Expectations Exception

Hypothesis 2: The future expectation exception to the 3 percent materiality provision of APB 15 [¶17] is not applied when material (> 3%) future dilution is expected.

Hypothesis 3: The future expectation exception to the 3 percent materiality provision of APB 15 [¶17] is not applied when immaterial (< 3%) future dilution is expected.

No Anti-Dilutive Security Provision

Hypothesis 4: Preparers of EPS favor at least one interpretation of the no anti-dilutive security provision of APB 15 [¶30, ¶40] in calculating PEPS.

Hypothesis 5: Preparers of EPS favor at least one interpretation of the no anti-dilutive security provision of APB 15 [¶30, ¶40] in calculating FDEPS.

Warrant/Option Dilution Determination Provision

Hypothesis 6: Preparers of EPS favor at least one interpretation of the warrant/option dilution determination provision of APB 15 [¶36, ¶42] in the calculation of PEPS.

Hypothesis 7: Preparers of EPS favor at least one interpretation of the warrant/option dilution determination provision of APB 15 [¶36, ¶42] in the calculation of FDEPS.
Methodology

An empirical investigation into the comparability and consistency of EPS required a research design that encompasses multiple research procedures. Primary data for the study was collected by means of a questionnaire survey. Questionnaires were mailed to a random sample of preparers of EPS data. Because of the nature of their work, accountants were considered the major preparers of EPS. For purposes of the study, three categories of accountants were identified: (1) Certified Public Accountants, (2) corporate accountants, and (3) accounting academicians. The sample was selected from accountants in each of the three identified categories who are located in the United States.

The questionnaire was designed to elicit data regarding the methods employed by accountants in computing and reporting EPS. Four basic cases were designed, each consisting of data necessary to compute EPS for a hypothetical company. The first case examined preparer interpretations of the 3 percent materiality provision. The second case examined the future expectation exception to the 3 percent materiality provision. The third case was designed to gather data concerning the application of the aggregate or the sequential approach. The fourth case elicited information concerning the application of the annual or the quarterly technique. One of the resulting cases was randomly assigned to each subject in each accountant group.

Upon receipt of the completed questionnaires, the responses were analyzed via nonparametric statistical tests appropriate for nominal data. A series of response improvement techniques were utilized in
order to increase the response rate. Appropriate techniques were undertaken to test for possible non-response bias.

**Relevancy of the Issues**

Evaluation of the method of computing EPS should be undertaken in view of the importance attached to the EPS figure by investors and the potential market effect of reported EPS. The market values the perceived stream of returns for a firm [Ross, 1977]. Assuming that investors use reported EPS to identify successful firms, then, if reported EPS exceeds (is less than) a critical level of EPS identified by the market (EPS*), the market perceives the company to be successful (unsuccessful) [Ross, 1977]. EPS* is assumed to represent the minimum amount of EPS that an unsuccessful company can report without going bankrupt [Copeland and Weston, 1980]. Thus, EPS may be used as a signal concerning the future success of a firm and, as a result, gives management an incentive to report the highest figure possible [Seidler, 1972]. Since investors act in accordance with their perceptions of the signal (e.g., EPS), the possibility arises for controlling the behavior of investors through the signal itself [Prakash and Rappaport, 1977].

While the market has been shown to be efficient with respect to most publicly available information [Gonedes and Dopuch, 1974; Sunder, 1976], the accountant's individual interpretations of the EPS guidelines are not part of the public domain. Thus investors must rely on the reported EPS figures as the signal concerning these behind-the-scenes calculations. Singhvi and Desai [1971], for example, investigated the quality of corporate financial disclosures and concluded that inadequate
Disclosure may result in greater price fluctuations as a result of less objective evidence.

The EPS signal perceived by investors may not be the true signal. The existence of alternative EPS computational/reporting interpretations allows the possibility of false signaling. The failure to invoke (or the invocation of) the future expectations clause of the 3 percent materiality provision when the exception is warranted (unwarranted) produces a false signal to investors. Knowledgeable investors may therefore interpret that the firm expects (does not expect) material dilution in future periods. While this signal may be intentional or unintentional, the possibility exists for the market as well as for individual investors to be misled. Actions based on these perceptions may result in the misallocation of resources in the market.

The aggregate approach, which includes all dilutive securities in EPS, generally results in a higher reported figure than the sequential approach. Whenever the EPS(aggregate) figure differs from the EPS(sequential) figure, the EPS(aggregate) will be closer to SEPS than the EPS(sequential). Thus, a firm which consistently follows the aggregate approach may consistently overstate the reported EPS in relation to the EPS reported by a firm consistently using the sequential approach. Based on the higher reported value for EPS, investors may assume that these aggregate approach firms are more successful than the firms following the sequential approach. As a result, the securities of the aggregate EPS firms may be overpriced and the misallocation of resources in the market may result.

Alternatively, the consistent application of the sequential approach may consistently underestimate the reported EPS in relation to
the EPS reported by firms consistently using the aggregate approach. As a result of the lower reported EPS value, investors may assume that these sequential approach companies are less successful than those which follow the aggregate approach. Accordingly, the securities of the sequential EPS companies may be underpriced and the misallocation of resources in the market could result.

In addition, the 3 percent materiality provision has a higher probability of being applied (i.e., reporting EPS for a simple capital structure) under the aggregate approach than under the sequential approach. The signal thus produced may, in fact, be a false signal, misleading unwary investors and resulting in a misallocation of resources. The existence of alternative approaches to computing EPS may help explain the "noise" found in many market studies.

Utilization of the annual approach to EPS calculation includes the effects of anti-dilutive quarters. EPS based on this inflated weighted average will be lower than EPS calculated under the quarterly technique which omits anti-dilutive quarters. The securities may be underpriced resulting in non-optimal resource allocation.

With a significant amount of resources flowing through the securities markets on a daily basis, signals such as EPS provide an important means of resource allocation. In order to avoid penalizing a firm because their accountant's interpretation of APB 15 results in a lower EPS figure than might otherwise be obtained, a uniform and consistent interpretation of the guidelines should be established. Failure to do so may ultimately diminish the comparability of EPS among firms and reduce meaningful communications concerning EPS.
Gonedes [as quoted by Griffin (1976)] has characterized EPS as the "realization of a 'GAAP-based' information generation process" [p. 637]. This study investigated this information-generation process. Determination of which EPS rules are being applied and assessment of the consistency of their application hopefully enhanced the computational utility of EPS. The results of this study contributed to accounting theory closure and increased the understanding of EPS. In addition, the study provided some preliminary evidence concerning possible market effects of computational differences.

Organization of the Study

The study has investigated the consistent application of the provisions of APB 15 in order to assess the comparability of the EPS figures. Chapter I has presented an overview of the study including the background of EPS, the computational problems resulting from APB 15, the research question answered, the hypotheses tested, the methodology followed, and the relevancy of the issues. Chapter II reviews the historical development of EPS and selected criticisms of the figure and its computational procedure. Chapter III considers selected provisions of APB 15 as well as selected accounting literature pertaining to EPS and its computational complexities. Chapter IV presents a detailed discussion of the research methodology including the sample selection methods, the data collection procedures, and the statistical analysis techniques employed. Chapter V presents an analysis of the results of the research study. Chapter VI, the study’s concluding chapter, discusses the implications of the study and provides suggestions for further research.
CHAPTER II

EPS: AN HISTORICAL PERSPECTIVE

This chapter presents a review of selected EPS literature. Such a review provides a basis for a more complete comprehension of a research study. The first part of this chapter chronicles the development of EPS in authoritative and quasi-authoritative accounting pronouncements. The second part reviews selected accounting literature critical of APB 15.

Development of EPS GAAP

The following sections examine the development of generally accepted accounting principles (GAAP) for the calculation and reporting of EPS. First, official EPS pronouncements prior to APB 15 are surveyed. Secondly, a brief overview of the major provisions of APB 15 is provided as well as the major reasons for the Opinion's issuance. Thirdly, the APB's own attempts at interpreting APB 15 are presented. Lastly, FASB endeavors to address selected EPS calculational problems are reviewed.

EPS GAAP Prior to APB 15

Historically the accounting profession has provided the principal source of guidance in the determination of EPS [Spacek, 1969]. The first authoritative accounting pronouncement concerned with EPS was
Accounting Research Bulletin (ARB) No. 49 Earnings Per Share issued in 1958 by the Committee on Accounting Procedure and in effect until 1967. ARB 49 defined EPS as net income less preferred stock dividends divided by the weighted average number of common shares outstanding during the period [¶5, ¶7]. Although ARB 49 referred to "common stock or other residual security" in its definition of EPS, the concept that other securities could be equivalent to common stock was not widely applied while the Bulletin was in effect [APB, 1969]. As a result, EPS under ARB 49 reflected historical information only. In addition, ARB 49 did not require EPS to be presented anywhere in the financial statements.

ARB 49 was superseded in 1967 by the issuance of APB Opinion No. 9 Reporting the Results of Operations which was in effect until 1969. Like ARB 49, APB 9 did not specifically require EPS to be presented anywhere in the financial statements. However, APB 9 formally recognized the importance of EPS and recommended a dual EPS disclosure. The first EPS figure was based on common stock and other residual securities (securities considered equivalent to common stock) [¶33] while the second figure incorporated securities with future dilution potential [¶43]. Dilution referred to the reduction in EPS as a result of the future conversion/exercise of existing contingencies [¶43].

Residual securities, as defined in APB 9 [¶33], consisted of the following outstanding securities: (1) securities from more than one class of common stock, (2) securities with participating dividend rights with common stock, and (3) securities with the major portion of their value derived from conversion rights or common stock characteristics. The residual status of convertible securities under this
definition was determined by means of the "major-portion-of-value" test applied at the security issue date and at all subsequent balance sheet dates [APB, 1969, ¶10]. Serious questions concerning this test were raised due to the variations which developed in its application in practice and the effects that changing debt/equity market conditions produced on residual security status [APB, 1969, ¶11].

APB 15

Because of growing concern over investor/business decisions based only on EPS and the apparent deficiencies of APB 9, the Securities and Exchange Commission (SEC) began pressuring the APB to provide a more meaningful and reliable EPS figure [Frishkoff, 1981]. In response to this pressure, the APB issued an exposure draft (ED) on EPS in November, 1968 [Landis, 1969; Barr, 1972]. All comments on the ED were to be submitted to the APB by January 13, 1969. This ED was two years in the making and represented an attempt to resolve the controversy surrounding EPS [Powers, 1970]. However, the ED failed to definitively describe the calculation of EPS and evoked considerable critical reaction [Landis, 1969].

The ED required that both EPS based on common stock and other outstanding residual securities and EPS based on the assumed conversion/issuance of all dilutive contingencies be presented on the face of the income statement [Landis, 1969]. The disclosure of the first EPS figure was required for all periods covered by the income statement; however, the disclosure of the second EPS figure was only required for the current year and for any subsequent interim period being reported on. The ED preferred the investment value approach of determining residual
status of securities, yet noted that the alternative market parity approach also had its merits. In addition, under the ED, residual security status was to be determined at issuance and at each subsequent balance sheet date, a provision of APB 9 which had drawn considerable criticism.

After reconsideration of the ED, the APB issued APB Opinion No. 15 Earnings Per Share in May, 1969. APB 15 differed significantly from the ED [Powers, 1970] and represented a compromise of diverse viewpoints [Cheney, 1971]. Several of the minority viewpoints outlined in the ED were adopted in APB 15 and some of the terminology changed. For example, APB 15 adopted neither the investment value approach nor the market parity approach, but rather required the prime rate test. In addition the term "common stock equivalent" was substituted for "residual security". Moreover, determination of common stock equivalency status was to be made only at the date of issuance of the security.

APB 15 has attempted to overcome the inconsistencies inherent in the EPS procedures outlined in APB 9, while emphasizing the role of EPS in investment decisions and firm evaluations. The Opinion requires two pro forma concepts of EPS to be presented with equal prominence on the face of the income statement [¶16]. These two EPS figures are (1) Primary Earnings Per Share (PEPS) and (2) Fully Diluted Earnings Per Share (FDEPS). PEPS denotes the amount of earnings attributable to each share of common stock and common stock equivalent (CSE) which has a dilutive effect on EPS. A dilutive effect (i.e., dilution) refers to a reduction in EPS as a result of the assumed conversion of a convertible security or the assumed exercise of a warrant/option [APB,
APB 15 defines a CSE as

... a security which is not, in form a common stock, but which usually contains provisions to enable its holder to become a common stockholder and which, because of its terms and the circumstances under which it was issued, is in substance equivalent to a common stock [APB, 1969, ¶25].

FDEPS reflects the current earnings per share assuming maximum dilution. The term "maximum dilution" refers to the dilution that would result from conversions and exercises of all securities (whether or not CSEs) that would individually and aggregately decrease EPS. Thus, by definition, FDEPS is less than or equal to PEPS [APB, 1969, ¶40].

APB 15 defines a simple capital structure as one consisting of only common stock or of common stock and nonconvertible securities, or one not reflecting material dilution [¶14]. Firms with simple capital structures should not report PEPS and FDEPS, but rather should report one EPS figure based on the weighted average number of common shares outstanding [¶14]. Firms whose capital structures are not simple are required to present both PEPS and FDEPS if material dilution is present. Material dilution is determined according to the 3 percent materiality provision (explained in Chapter III). Anti-dilutive securities (i.e., those that increase EPS or decrease loss per share) should be omitted from EPS calculations [¶30, ¶40].

The common stock equivalency status of convertible debentures and convertible preferred stock is determined via the prime rate test, as amended by SFAS 55 and SFAS 85 (discussed later in this chapter). Under the original test specified in APB 15, convertible securities were considered CSEs if the cash yield rate of the security was less than 2/3 of the bank prime interest rate at the date of issuance of the security.
The "if-converted" method is utilized to determine the actual effects of the convertible securities on the computation of the EPS figures. Dilutive CSEs should be included in both PEPS and FDEPS; dilutive securities that are not CSEs should be included only in FDEPS.

Warrants and options are by definition CSEs and thus should always be included in EPS calculations when dilutive. However, conversion is assumed only after the market price has exceeded the exercise price for "substantially all of three consecutive months ending with the last month of the period to which earnings per share data relate." Once this three month test is satisfied, APB 15 requires treatment of warrants/options per the treasury stock method (explained in Chapter III).

By drawing the user's attention to possible dilutions of common stock, the APB emphasized substance over form and felt that the economic impact of firm activities would be more clearly presented. Because of the importance attached to the reported figure, a consistent basis for computing EPS was considered imperative. The APB viewed the rather elaborate provisions of APB 15 as an attempt to provide a uniform set of EPS computational and presentation rules. Nevertheless, five of the fifteen APB members voting for adoption of APB 15 assented to the Opinion with qualifications while three APB members dissented entirely. Criticisms enumerated by these eight APB members included opposition to the automatic inclusion of warrants/options in PEPS, disagreement with the one-time determination of CSE status, dissatisfaction with utilization of the treasury
stock method, etc. Dissenting members expressed the belief that EPS belongs to financial analysis, not accounting, and that EPS computations per APB 15 fail to serve the needs of investors.

Unofficial Interpretations of APB 15

The first attempt to interpret the complex provisions of APB 15 came in 1970 from the APB itself in the form of a series of Unofficial Accounting Interpretations of APB 15.\(^{1}\) The document is nearly three times the length of APB 15 itself and includes 101 interpretations encompassing all of the provisions of APB 15.\(^{2}\) Utilization of a question-and-answer format allows the reader to focus on specific areas of concern.

The first eight interpretations attempt to clarify the ambiguous terminology in APB 15 by concentrating on definitions of key terms, such as common stock equivalent, dilution, dual presentation, etc. Interpretations 9-23 focus on the applicability of APB 15 and the financial statement presentation of EPS. With the exception of Interpretations 100 and 101 which are also concerned with EPS disclosures, the remainder of these APB Interpretations attempts to clarify specific computational procedures of APB 15.

\(^{1}\)The authorship of the document is attributed to J.T. Ball who was research associate for accounting interpretations for the AICPA at the time. In this position, he was the author of interpretations of APB Opinions for the APB. Currently, Mr. Ball is the assistant director of research and technical activities for the FASB.

\(^{2}\)One further interpretation of APB 15 was issued by the APB. In 1971, the APB issued Interpretation 102 of APB 15. This interpretation, however, dealt only with the effect on EPS computations of warrants issued by real estate investment trusts.
The series of APB interpretations represents an attempt to cover areas either not expressly stated in APB 15 or only alluded to in the Opinion, such as changes in security classification, treatment of actual conversions and exercises, etc. However, the interpretations may, perhaps, themselves be as difficult to understand as the related provisions of APB 15 they attempt to interpret. As a result, the accountant may often be forced to rely on other EPS interpretational sources for solutions to particular EPS problems and questions.

Although not explicitly covered by Rule 203 of the AICPA Code of Ethics, APB accounting interpretations nevertheless constitute a source of "established accounting principles" [Auditing Standards Board, 1975, ¶411.07]. Other identified sources of these principles are industry audit guides, textbooks, accounting guides, journal articles, etc. When these sources report conflicting accounting treatments, auditors should select the one that best "presents the substance...in the circumstances" [Auditing Standards Board, 1975, ¶411.07]. A question is thus raised concerning the degree to which current practices adhere to the APB's unofficial interpretations of APB 15.

Refinements to EPS GAAP

In response to criticisms of APB 15 and to changing market conditions, the FASB has issued several pronouncements which attempt to refine or to improve selected provisions of APB 15. Statement of Financial Accounting Standards (SFAS) No. 55 Determining Whether a Convertible Security Is a Common Stock Equivalent [FASB, 1982] amends the cash yield test of determining the common stock equivalency of convertible securities. Noting that the prime interest rate has been
rather volatile in recent years, the FASB recommended the use of the average Aa corporate bond yield rate in place of the prime interest rate in the cash yield test. In support of this change, the FASB noted that the average Aa bond rate would provide a test of CSE status which is more indicative of economic reality since the rate is more associated with long term borrowings.

The FASB further amended APB 15 in 1985 by issuing SFAS No. 85 Yield Test for Determining Whether a Convertible Security Is a Common Stock Equivalent [FASB, 1985]. SFAS 85 substitutes an "effective yield" test for the cash yield test. In support of this change, the FASB noted that issuances of certain securities, such as zero coupon bonds, result in a cash yield test whose results are meaningless. The effective yield is based on the stated annual interest or dividend payments, any original premium/discount, and any call premium/discount.

In addition to SFAS 55 and SFAS 85, the FASB has issued two interpretations of APB 15 concerned with one specific aspect of EPS computations. FASB Interpretation 28, issued in 1978, and FASB Interpretation 31, issued in 1980, are both concerned with the treatment of stock compensation plans in the calculation of EPS. However, unlike the APB interpretations, FASB interpretations retain the same status as APB Opinions and FASB standards and thus represent preferred GAAP [Auditing Standards Board, 1975, ¶411.06].

Overview of Selected EPS Literature

APB 15, as amended, outlines a series of provisions to be followed in the computation of EPS. Criticisms have been levied against APB 15 as a whole as well as against specific provisions of the Opinion. The
following sections discuss some of the major criticisms of APB 15 found in the accounting literature. The first section focuses on analytically based criticisms of APB 15 and on proposed alternatives to the procedures required in APB 15. The second section focuses on empirical studies of specific provisions of APB 15 and of the EPS figures produced via these provisions.

**Analytical Literature**

Many accountants have criticized the provisions of APB 15 as being arbitrary or unsound. [See, for example, Spacek, 1969; FASB, 1982 (dissent); Rice, 1978; APB, 1969 (dissent); Knutson, 1970; FASB, 1985 (dissent)]. The fact that EPS may be based on numbers and classifications not reported on the financial statements or even contractually possible strikes some as abhorrent [Schachner, 1978]. Criticisms have been levied against most of the major provisions of APB 15 and often alternatives/solutions have been proposed. As will be discussed in a later section, little evidence has been found supporting the relationship between common stock equivalency status and actual conversion.

**General Criticisms of APB 15.** Hendriksen [1982] noted that neither PEPS nor FDEPS considers the probability of exercise or conversion and that both calculations are based on arbitrary rules and assumptions. Spacek has likened the EPS rules to the Internal Revenue Code [1969, p. 10]. William Paton [1971] referred to APB 15 as "a mess" and confessed to feeling frustrated and disgusted upon attempting to read the Opinion. He chided the APB for tackling what he termed "a clerical question" with little relationship to accounting principles [p. 42].
Researchers have often criticized specific provisions/procedures of APB 15 on analytical grounds. For example, Shank [1971] hypothesized that an endless loop exists between the reported EPS calculated via the treasury stock method and stock prices. The treasury stock method utilizes current stock prices to calculate EPS; however, these prices change upon the issuance of the EPS figure. (This relationship is discussed further in Chapter III.) According to Shank's scenario, this price change triggers a recalculation of EPS based on the new stock prices. This recalculated figure again results in a new stock price. Thus, a chain reaction between reported EPS and stock prices will be established. Shank concluded that a stock price behavior model must be adopted in order to overcome this chain reaction and to correctly apply the treasury stock method.

Other examples of such theoretical differences of opinion include Barlev [1983] and Vigeland [1982]. Barlev [1983] concluded that the modified treasury stock method per APB 15 has a built-in distortion effect and that the dilutive effects of options/warrants are subject to potential manipulation as a result of being subject to managerial discretion. Vigeland [1982], who viewed potentially dilutive securities as contingencies, concluded that the Opinion does not allow the application of the contingency recognition criteria, but rather requires conditions present at issuance to dictate the EPS treatment.

**Alternative Proposals for Reporting EPS.** In addition to criticizing the theoretical foundation of APB 15, writers have frequently proposed their own solutions to the calculation of EPS. For example, Curry [1971] criticized APB 15 for the treatment accorded convertible debentures. He believed that both the equity and debt features of a
convertible debenture should be recognized in computing EPS. In his view, APB 15 produces an EPS figure which is inconsistent with other data shown in the annual report (i.e., the classification of the debenture as debt and the nonrecognition of the equity element per APB 14). To overcome this defect, he proposed a dual method of reporting EPS based on the assumption of equality of importance of both features. Under this dual method, one EPS figure would be calculated under a nonconversion assumption and a second computed under a conversion assumption. According to Curry, this approach avoids bias in reporting EPS and allows the reader to determine for himself how the debenture should be classified. In his opinion, this comprehensive dual reporting method more nearly meets the criteria of useful information.

Another alternative to APB 15 proposed by Parker and Cushing [1971] advocated a utilitarian approach for the calculation of EPS. They concluded that the method for computing EPS required by APB 15 is neither useful nor adequate for predictive purposes. As an alternative, they suggested a framework for computing EPS under the one-class and the two-class methods. Both the ratio of a security's investment value to its exercisable value and the ratio of its current cash flows to its future cash flows determine which of the methods should be utilized. Under the one-class method, earnings are allocated to the weighted average number of common and common equivalent shares outstanding during the year. The two-class method divides current income into distributed (through dividends) and undistributed portions and then allocates each among currently existing equity and potential future equity. After examining EPS calculations in four hypothetical situations,
Parker and Cushing concluded that different methods should be applied in different situations and that consistency should be sacrificed for usefulness.

Jolly [1978] proposed an alternative method of computing EPS based on the residual equity theory of accounting. His EPS computation distinguished between distributed and undistributed earnings in a manner similar to Parker and Cushing's two-class method. Jolly found a significant positive association between his proposed EPS and SEPS. In addition, he found no association between his proposed EPS and either PEPS or FDEPS. Based on his findings, Jolly concluded that his proposed EPS was superior to PEPS and FDEPS in the determination of security prices in the market.

**Empirical Literature**

Empirical investigations of the EPS figures produced via APB 15 have been conducted. As a result of these studies, the justification for the APB 15 calculational procedures has been questioned. Despite the debate surrounding the computation of EPS, the reported figure itself is a key financial statistic used by investors as a measure of corporate performance. Utilization of EPS in this manner may help to explain the concern of accountants regarding the provisions of APB 15.

**Studies of CSE Status.** Researchers have been particularly concerned with the cash yield test for classifying convertible securities as CSEs. In one of the first and most frequently cited studies of the cash yield test, Frank and Weygandt [1970] found little relationship between the classification of convertible debt as a CSE and its actual
conversion. As a result, they concluded that the application of APB 15 results in many misclassifications, thereby confusing financial statement readers. Extensions of this study by Hofstedt and West [1971], Arnold and Humann [1973], and Rhodes and Snavely [1973] supported Frank and Weygandt's conclusions.

In an examination of the CSE status of convertible debentures, Gibson and Williams [1973] found that use of the prime interest rate results in a minimal number of convertibles being classified as CSEs. As a result, they concluded that use of the prime rate ignores the risk potential of the issuing firm as well as the term structure of the prime rate itself. Gibson and Williams further concluded that the CSE-related criteria in APB 15 are arbitrary and not meaningful on a practical or on a theoretical basis [p. 213].

The cash yield test has received partial support in at least one study. For example, Givoly and Palmon [1981] found that, although the cash yield test had deficiencies, the method is a "good" surrogate for the theoretically superior (but not allowed under APB 15) tests of market parity and investment value when measured with current market yields (also not allowed under APB 15).

Other researchers have developed alternative procedures to the cash yield test of APB 15. For example, Knauf [1981] attempted to develop an improved method for determining CSEs. She noted that no sound theoretical definition of CSE exists and therefore utilized a definition based on predicted conversions within the coming year. She found that two criteria had a greater than 85 percent rate of success in predicting conversion: (1) the ratio of conversion value to face value, and (2) the ratio of conversion value to call price. She proposed that either
of these criteria should replace the 66 2/3 percent limit of the cash yield test as a result of its superior predictive ability. Others who have proposed alternatives to the cash yield percentage include Frank and Weygandt [1971], Hofstedt and West [1971], and Gibson and Williams [1973].

As previously noted, the FASB has responded to criticisms of the cash yield test with two standards amending APB 15: SFAS 55 [1982] and SFAS 85 [1985]. Support for the FASB amendments may be found, for example, in Sterner's [1983] study of the relationship between CSE classification via SFAS 55 and actual conversion. Sterner found that the Aa corporate bond yield method had some predictive ability especially when applied on an annual basis (which is still not allowed under APB 15).

Cox [1985] compared eight alternative tests for CSEs to assess the ability of each to predict conversion of convertible bonds. He found that, assuming interest rate inversion continues, SFAS 55 provides a more accurate measure of PEPS for new bond issuances. A return to the traditional relationship between interest rates (i.e., short term rates below long term rates) coupled with application of SFAS 55 will result in less accurate, but, for new bond issuances, more conservative (lower) PEPS. Cox called for the elimination of the notion of CSEs and the concept of PEPS. He felt that only SEPS should be presented with adequate disclosure of convertible securities, warrants, and options.

Usefulness of EPS. Beaver [1968] noted that "the information content of earnings is an issue of obvious value." Accordingly, the utilization of EPS by the capital market's security pricing mechanism has
been the subject of frequent examination under the efficient markets hypothesis (EMH). Studies by Ball and Brown [1968], Beaver [1968], Neiderhoffer and Regan [1972], and Beaver, Clarke, and Wright [1979] found that knowledge of earnings changes provides information which is impounded in security prices. Ball and Brown [1968] also found that over half of the available information about a firm was captured by the reported net income figure.

Gonedes [1974], in a study of the joint market effects of accounting numbers, supported the importance of the information content of EPS relative to other accounting numbers examined. Studies by Griffin [1976], Schreiner [1976], Chant [1980], and Elton, Gruber, and Gultekin [1981] suggest that the aggregate capital market responds to information conveyed by the EPS announcement, adding further support to the importance of EPS as a determinant of stock prices. Thus, empirical evidence exists supporting a strong association between reported EPS figures and stock prices. [For further discussion, see, for example, Downes and Dyckman, 1973; Basu, 1977; Gonedes, 1972, 1974; Brown and Kennelly, 1972; Beaver and Dukes, 1972, 1973; Beaver and Landsman, 1983; Ziebart, 1983; Brown and Ball, 1967; Beaver, Kennelly, and Voss, 1968; Heck, 1983].

In addition to its importance in determining stock prices, EPS provides investors with a basis from which to assess and analyze the past earnings performance of a company [Knutson, 1970]. This analysis

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3The EMH has been the subject of extensive debate and research in accounting, finance, and other disciplines. For further discussion, see Sharpe, 1981; Foster, 1978; Rubenstein, 1973; Fama, 1970; Beaver, 1981a, 1981b; Mayer-Sommer, 1979; Abdel-khalik, 1972; Finnerty, 1976; Cowton and Garrod, 1981; Dyckman, Downes, and Magee, 1975.
frequently depends on the investor's own interpretations of EPS and the APB 15 calculational/reporting procedures. A lack of communication between the EPS provider (i.e., the firm) and the EPS receiver (i.e., the investor) may result in a decline in investor understanding of the firm's EPS, and, perhaps, in the usefulness of the reported figure(s).

Evidence of a possible communication breakdown regarding EPS is provided by Flaherty and Schwartz [1980]. Their examination of the EPS disclosures for 195 firms with options/warrants found that less than 10 percent of the sample firms provided adequate disclosure. Nearly 40 percent of the firms disclosed only one EPS figure with only 18 percent of those firms indicating that no material difference existed between PEP$S$ and FDEPS. As the authors note, this may be the case for the other 82 percent, however no explanations were provided in the financial statements. Terminology was found to be vague and usage diverse with reported EPS being referred to by several different descriptive phrases (e.g., net income per common share, earnings per common share, primary earnings per share, earnings per average share outstanding, etc.). Based on their examination, Flaherty and Schwartz concluded that most firms fail to disclose adequate information for the reconstruction and, therefore, understanding, of EPS by readers. Furthermore, they concluded that this situation resulted from the complexity and lack of specific guidelines in the provisions of APB 15.

Questions have arisen concerning the utilization of EPS figures for predictive purposes since the figures represent possibly unrealistic expectations [Dudley, 1985]. Courtenay [1982] examined the
predictive abilities of EPS per APB 15 and analyzed the rates of return for 71 companies with forced conversions. He found that the type of security converted resulted in significantly different market reactions. In particular, he found that negative stock value changes were associated with calls of convertible debt; however, calls of convertible preferred stock were associated with systematic risk levels. He concluded that, when convertible securities are present, APB 15 failed to achieve the objectives of financial reporting established in Statement of Financial Accounting Concepts (SFAC) No. 1 [FASB, 1978a], and failed, in particular, in the assessment of future cash flows.

Parikh [1982] found that, in the assessment of potential future dilutions of common stock, PEPS failed to provide a superior surrogate for SEPS under all circumstances. Similarly, Kross, Chapman, and Strand [1980] found that FDEPS did not provide incremental benefit to investors and concluded that FDEPS per APB 15 did not represent a useful measure of potential future dilution.

Empirical evidence also suggests that, over time, differences among SEPS, PEPS, and FDEPS are not statistically significant. For example, Frankfurter and Horwitz [1972] used a simulation model to study the effects of warrants and options on SEPS, PEPS, and FDEPS under differing conditions. SEPS, PEPS, and FDEPS were simulated for 35 periods for three hypothetical firms (one with no residual securities; one with convertible debt only; and one with convertible debt and warrants). Based on analysis of the simulated EPS figures, Frankfurter and Horwitz concluded that, in the long run, no difference existed among the three EPS figures for firms with different debt structures. As a result, Frankfurter and Horwitz felt that
APB 15 imposed "an administrative burden on management without any significant improvement over the traditional method of calculation" [p. 253]. Thompson [1974] agreed with Frankfurter and Horwitz based on his investigation of the ability of PEPS and FDEPS to predict future EPS and returns to investors.

The preceding survey indicates that, while the EPS figure is important in the determination of stock prices, questions concerning the usefulness of EPS calculated via APB 15 have arisen. As the discussion in this and the previous section indicates the term "Earnings Per Share" has been supplied, but a precise definition of the term has not been. The accounting profession seems to have developed a set of EPS guidelines that are difficult both to understand and to apply. Many researchers have called for the abandonment or further modification of the EPS procedures and, perhaps, adoption of an approach similar to that of Canada⁴ or Great Britain⁵. As noted, however, these proposed solutions have met with little apparent success. Thus EPS via APB 15 remains a controversial figure on the financial statements.

Summary

This chapter has attempted to provide the background necessary for a further understanding of the problems inherent in the EPS area. An

⁴Canada requires presentation of a "basic" earnings per share computed in terms of actual number of common shares issued and outstanding, a "fully diluted" earnings per share reflecting maximum dilution, and a "pro forma" earnings per share adjusted for subsequent events [Henderson, 1972; Schachner, 1978].

⁵Great Britain requires only the reporting of "basic" earnings per share (see footnote 4) and "fully diluted" earnings per share. However, extraordinary items are not included in the British computations [Accounting Standards Steering Committee, 1974].
examination of the historical development of EPS establishes a basis from which to expand the knowledge of EPS and its computational intricacies. The overview of criticisms of APB 15 highlights the controversial nature of the Opinion and its various provisions.

The importance of the reported EPS figure and such APB 15 criticisms as vagueness and ambiguity emphasize the need for a closer examination of APB 15. The next chapter examines more closely selected provisions of APB 15 which lend themselves to multiple interpretations and reviews selected attempts by accountants to understand and apply the provisions of APB 15.
CHAPTER III

APB 15: COMPUTATIONAL PROVISIONS AND INTERPRETATIONS

A review of APB 15 provisions and efforts of accounting researchers to interpret these provisions for calculational purposes illustrates the diversity of opinion and lack of standardization existing in the EPS area. In this chapter, selected provisions of APB 15 are first examined and alternative interpretations noted. Secondly, selected literature which attempts to interpret the computational guidelines of APB 15 are surveyed. A review of EPS computational approaches in intermediate accounting textbooks is then presented. Lastly, possible consequences which may result from the calculation of the EPS signal via alternative interpretations of APB 15 provisions are discussed.

Selected Computational Provisions of APB 15

The complex array of calculational provisions and the ambiguity of the language in APB 15 strongly suggest that alternative interpretations of APB 15 may exist. Among the provisions for which conflicting approaches may be found are (1) the 3 percent materiality provision [¶15], (2) the future expectation exception to the 3 percent materiality provision [¶17], (3) the no anti-dilutive security provision [¶30, ¶40], and (4) the warrant/option dilution determination provision [¶36, ¶42]. Each of these provisions and the alternative interpretations which have developed are discussed in the following sections.
3 Percent Materiality Provision

The 3 percent materiality provision, found in footnote 2 to ¶15 of APB 15, requires that "any reduction of less than 3% in the aggregate need not be considered as dilution in the computation and presentation of earnings per share..." This provision requires that reported EPS be materially different from SEPS which is calculated by dividing net income adjusted for preferred stock dividends by the weighted average number of common shares outstanding [APB, 1969, ¶14]. Different interpretations may be found in accounting literature concerning the application of this provision for determining material dilution. Three interpretations are discussed in the following paragraphs and their effects illustrated using the data from Case 1 of the test instrument. Each interpretation has support in accounting textbooks and/or journal articles (as will be noted in later sections).

Under the first interpretation, material dilution is determined individually for PEPS and for FDEPS by comparing each figure to SEPS. For example, if SEPS is $3,000, then PEPS and FDEPS must be less than $2,910 in order to reflect material dilution. If the PEPS dilution is not material, then the SEPS figure would be reported as PEPS. If the FDEPS is also not materially different from SEPS, then only one EPS figure need be reported - SEPS. However, if FDEPS is material, then the dual presentation is required.

EXAMPLE. Using the data from Case 1 of the test instrument as shown on the next page, calculated PEPS does not reflect material dilution; i.e., $2,950 > $2,910 ($2,910 = 97% of $3,000). Calculated FDEPS, however, does reflect material dilution; i.e., $2,884 < $2,910. Thus, under this interpretation, PEPS would be reported on the income statement as $3,000 and FDEPS as $2,884.
FIGURE 1
DATA FROM CASE 1 OF TEST INSTRUMENT

Net Income $187,500

Common stock outstanding all year 60,000 common shares

Cumulative, convertible preferred stock:
  NOT a common stock equivalent
  Number of shares issuable at conversion 4,000 common shares

Options to purchase common shares:
  Outstanding all year
  3 month test met in prior years
  Number of incremental shares 1,000 incremental common shares

Dividends declared and paid:
  On preferred stock $ 7,500
  On common stock - 0 -

Simple Earnings Per Share: \[ \frac{187,500 - 7,500}{60,000 \text{ shares}} = 3.000 \]

Calculated Primary Earnings Per Share:
\[ \frac{187,500 - 7,500}{60,000 + 1,000} = \frac{180,000}{61,000 \text{ shares}} = 2.950 \]

Calculated Fully Diluted Earnings Per Share:
\[ \frac{187,500}{60,000 + 1,000 + 4,000} = \frac{187,500}{65,000 \text{ shares}} = 2.884 \]
Companies which apply this first interpretation may show a greater difference between PEPS and FDEPS than either of the other two interpretations. This is especially true when FDEPS is less than 97 percent of SEPS, but PEPS is greater than 97 percent. Readers who do not know that material dilution is being individually determined may misinterpret the situation.

A second interpretation applies the rule only to FDEPS. Under this interpretation, if FDEPS reflects material dilution, then both the PEPS figure and the FDEPS figure must be reported as calculated regardless of whether PEPS reflects material dilution.

EXAMPLE. Using the same data from Figure 1, only the dilutive status of FDEPS is of consequence. Since FDEPS reflects material dilution (i.e., $2,884 < $2,910), this interpretation would require the presentation of PEPS of $2,950 and FDEPS of $2,884.

Under this interpretation, if a FDEPS figure is reported, then the calculated PEPS figure is also reported regardless of its materiality. Readers who utilize such figures may falsely assume that both PEPS and FDEPS reflect material dilution.

The third interpretation applies the 3 percent materiality provision to the difference between PEPS and FDEPS. This interpretation holds that PEPS and FDEPS must be materially different from each other without regard to SEPS. Thus, as long as PEPS and FDEPS are more than 3 percent apart, both would be reported.

EXAMPLE. Again utilizing the data from Figure 1, only the dilutive status of FDEPS is of consequence; PEPS is reported as calculated. FDEPS does not reflect material dilution; i.e., $2,884 > $2,891 ($2,891 = 97% of PEPS of $2,950). Thus, under this interpretation, only one EPS figure ($2,950) would be reported on the income statement since PEPS and FDEPS are less than 3 percent apart.
Application of the third interpretation always results in the reporting of calculated PEPS regardless of whether the figure is materially different from SEPS. Comparison of FDEPS to PEPS to determine its materiality increases the possibility of immaterial dilution being found and thus only one figure (PEPS) being reported. Readers utilizing EPS figures prepared under this interpretation may mistakenly assume that no further dilution is possible. Flaherty and Schwartz's [1980] survey of annual reports supports the existence of this interpretation.

Future Expectations Exception

Adding to the confusion in the application of the 3 percent materiality provision is the future expectations exception to the provision [V17]. The APB's Unofficial Accounting Interpretations of APB 15 [Ball, 1971] allow the 3 percent provision to be ignored based on the expectation of future dilution. If material future dilution is (not) expected, then current EPS need (not) report material dilution.

EXAMPLE. Again using the data from Figure 1, if no material dilution is expected in the next period, this exception allows the firm to ignore any current dilution and to report only SEPS of $3,000.

Although APB 15 does not specifically mention this future expectation exception, the emphasis on the EPS presentation as a tool for understanding both the "extent and trend of potential dilution" [APB, 1969, V17] provides the rule's basis [Ball, 1970, Question 11].

No Anti-Dilutive Security Provision

Another provision of APB 15 for which alternative interpretations have developed relates to the procedure for including dilutive securities in PEPS and in FDEPS. APB 15 provides that only those securities
which have a dilutive effect on EPS (i.e., decrease the figure) be included in the EPS computation [¶30, ¶40]. Two interpretations of this provision, often referred to as the no anti-dilutive security provision, have developed: (1) the aggregate approach and (2) the sequential approach.

The aggregate approach determines dilution on an individual security basis; i.e., the effects of other securities are ignored. For each security, EPS is calculated including only the income and share effects of that particular security. This EPS figure is then compared to SEPS to determine whether the security is dilutive or not. For the PEPS figure, only those common stock equivalents (CSEs) which are individually dilutive are included in the computation. In determining FDEPS, only those other potentially dilutive securities (OPDSs) which are individually dilutive and those CSEs which are individually dilutive are included in the calculation.

In contrast, the sequential approach in calculating PEPS compares all possible combinations of CSEs. The combination of CSEs which produces the smallest PEPS figure is then selected. With respect to FDEPS, the sequential approach compares all possible combinations of CSEs and other potentially dilutive securities. The reported FDEPS results from the combination producing the smallest FDEPS figure. Generally, warrants/options are entered first, then other CSEs, and, lastly (for FDEPS), other potentially dilutive securities. Under this approach, the dilutive nature of a security is determined by its incremental effect on EPS as determined by previously entered securities.

Figure 2, on the next page, contrasts the calculation of PEPS for Case 3 of the test instrument under the two approaches. The two CSEs are
FIGURE 2
AGGREGATE VS. SEQUENTIAL APPROACH

Net income $234,000

Common stock outstanding all year 50,000 common shares

Cumulative, convertible preferred stock:

<table>
<thead>
<tr>
<th>Common stock equivalent?</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
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<td>No</td>
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<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dividends declared and paid $1,000 $23,000 $10,000 $50,000

Common shares issuable on conversion 30,000 8,000 40,000 17,000

Simple Earnings Per Share: \[
\frac{\$234,000 - \$84,000}{50,000 \text{ shares}} = \$3.000
\]

Aggregate Approach:
\[
\frac{\$234,000 - 60,000}{50,000 + 30,000 + 8,000} = \frac{\$174,000}{88,000 \text{ shares}} = \$1.977
\]

Since $1.977 < $3.000, reported PEPS is $1.977.

Sequential Approach:

PEPS With Security A Only:
\[
\frac{\$234,000 - 83,000}{50,000 + 30,000} = \frac{\$151,000}{80,000 \text{ shares}} = \$1.888
\]

PEPS With Security B Only:
\[
\frac{\$234,000 - 61,000}{50,000 + 8,000} = \frac{\$173,000}{58,000 \text{ shares}} = \$2.983
\]

PEPS With Both Securities:
\[
\frac{\$234,000 - 60,000}{50,000 + 30,000 + 8,000} = \frac{\$174,000}{88,000 \text{ shares}} = \$1.977
\]

Select the lowest PEPS; reported PEPS is $1.888.
individually dilutive (i.e., each alone reduces PEPS below the SEPS figure of $3,000). Under the aggregate approach, both CSEs would be included in the computation of PEPS and reported PEPS would be $1,977. This approach is simple and straightforward, requiring only one PEPS computation (in this example).

The alternative sequential approach requires three PEPS calculations (in this example) in order to determine reported PEPS. All combinations of CSEs (Security A only, Security B only, and both securities) must be considered. The lowest of the three PEPS calculations ($1,888) is then reported on the income statement. Thus, the sequential approach results in the lowest possible PEPS under these circumstances and more nearly reflects the intent of the APB [Lorio, 1971].

Warrant/Option Dilution Determination Provision

Multiple interpretations also exist regarding the determination of the dilution of warrants/options. By definition, warrants/options are common stock equivalents and should be included in the EPS computations when dilutive [APB, 1969, ¶35]. Dilution is determined by comparing market price to exercise price. For PEPS, whenever average market exceeds exercise price, the warrant/option is dilutive [¶36]. For FDEPS, exercise price is compared to the higher of average or ending market price [¶42]. Again, if market exceeds exercise price, the warrant/option is dilutive.

The procedure for handling warrants/options under APB 15 is called the treasury stock method. Under this method, only incremental shares associated with a warrant/option are included in the EPS computation. Incremental shares represent the share difference between shares to be
issued upon conversion and shares assumed purchased under the treasury stock method.

Two techniques have developed for determining the dilutive nature of warrants/options and consequently the number of incremental shares: (1) the annual technique and (2) the quarterly technique. The annual technique determines the dilutive nature of warrants/options by comparing exercise price to the appropriate annual market price. The warrant/option is either dilutive or anti-dilutive for the entire year. Incremental shares are thus determined on an annual basis including any anti-dilutive quarters.

Under the quarterly technique, the dilution of a warrant/option is determined on a quarterly basis; i.e., each quarter's appropriate market price (average for PEPS; average or ending, whichever is higher, for FDEPS) is compared to the exercise price. In those quarters where exercise price exceeds the appropriate market price, the warrant/option is deemed anti-dilutive, no conversion is assumed, and incremental shares are zero. For quarters where exercise price is less than the appropriate market price, the warrant/option is considered dilutive, conversion is assumed, and incremental shares are determined. This approach avoids offsetting dilutive and anti-dilutive quarters. A four-quarter average of the incremental shares is then utilized in calculating EPS.

Two variations of the quarterly technique exist; both utilize a sequential procedure for identifying dilutive quarters. Under the first variation, a dilutive quarter will be included in the computation of EPS only if all preceding quarters are dilutive. As soon as an anti-dilutive quarter is identified, dilution determination ceases. The anti-dilutive
quarter and all subsequent quarters are assumed to have zero incremental shares. Thus, before Quarter 4 may be considered, Quarters 1, 2, and 3 must also be dilutive.

The second variation considers the quarters in reverse order. Upon the identification of an anti-dilutive quarter, dilution determination ceases. The anti-dilutive and prior quarters are assumed to have zero incremental shares. Therefore, before Quarter 1 may be considered, Quarters 4, 3, and 2 (in that order) must also be dilutive.

Figure 3, on the next page, illustrates the calculation of PEPS for Case 4 of the test instrument under the annual technique and the first quarterly technique. For purposes of simplification, average and ending market prices for each quarter are assumed to be equal; however, annual average and year-end market prices are not equal. Under the annual technique, dilution is determined once for the whole year. Only one calculation of incremental shares is necessary (2,593 shares). In contrast, the quarterly technique (in this example) requires four separate dilution determinations (dilutive for quarters 1 and 4) and two separate incremental share calculations (quarter 1, 2,000 shares; quarter 4, 5,000 shares) in order to derive the overall quarterly average incremental shares (1,750 shares).

Figure 3 reveals that PEPS per the annual technique ($2.852) is lower than PEPS per the quarterly technique ($2.900). This difference results from the larger number of incremental shares used under the annual approach which allows the inclusion of anti-dilutive quarters in the calculation.

Figure 4, on the page 47, utilizes the same basic data to illustrate the calculation of PEPS via the two previously discussed
FIGURE 3

ANNUAL VS. QUARTERLY TECHNIQUE

<table>
<thead>
<tr>
<th></th>
<th>Annual Technique</th>
<th>Quarterly Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>$160,000</td>
<td></td>
</tr>
<tr>
<td>Common stock outstanding all year</td>
<td>50,000 common shares</td>
<td></td>
</tr>
<tr>
<td>Cumulative, convertible preferred stock:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividends declared and paid</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td>Options to purchase common shares:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outstanding all year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 month test met in prior year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of shares issuable on conversion</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Exercise price per share</td>
<td>$20 per share</td>
<td></td>
</tr>
<tr>
<td>Market price per share of common stock:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarter 1</td>
<td>Average/Ending</td>
<td>Quarter 2</td>
</tr>
<tr>
<td>1</td>
<td>$25</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Annual Average Market Price</td>
<td>$27</td>
<td></td>
</tr>
<tr>
<td>Year-end Market Price</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

**Annual Technique:**

Dilution Determination: $20 exercise price < $27 annual market price

Incremental Shares: 10,000 - \( \frac{200,000}{27} \) = 10,000 - 7,407 = 2,593

Primary Earnings : \( \frac{160,000 - 10,000}{50,000 + 2,593} \) = \( \frac{150,000}{52,593} \) shares = $2.852

**Quarterly Technique:**

Dilution Determination:
- Quarter 1: $20 exercise price < $25 market price   Dilutive
- Quarter 2: $20 exercise price > $17 market price   Anti-Dilutive
- Quarter 3: $20 exercise price > $19 market price   Anti-Dilutive
- Quarter 4: $20 exercise price < $40 market price   Dilutive

Incremental Shares:
- Quarter 1: 10,000 - \( \frac{200,000}{25} \) = 10,000 - 8,000 = 2,000
- Quarter 2: - 0 -                         
- Quarter 3: - 0 -                         
- Quarter 4: 10,000 - \( \frac{200,000}{40} \) = 10,000 - 5,000 = 5,000

Four Quarter Average: \( \frac{2,000 + 0 + 0 + 5,000}{4} \) = 1,750

Primary Earnings : \( \frac{160,000 - 10,000}{50,000 + 1,750} \) = \( \frac{150,000}{51,750} \) shares = $2.900
FIGURE 4
VARIATIONS OF QUARTERLY TECHNIQUE

First Variation

Dilution Determination:
Quarter 1: $20 exercise price < $25 market price Dilutive
Quarter 2: $20 exercise price > $17 market price Anti-Dilutive
Quarter 3: No dilution determination necessary
Quarter 4: No dilution determination necessary

Incremental Shares:
Quarter 1: \[
\frac{10,000 - \frac{200,000}{25}}{10,000 - 8,000} = 2,000
\]
Quarter 2: - 0 -
Quarter 3: - 0 -
Quarter 4: - 0 -

Four Quarter Average: \[
\frac{2,000 + 0 + 0 + 0}{4} = 500
\]

Primary Earnings: \[
\frac{160,000 - 10,000}{50,000 + 500} = \frac{150,000}{50,500 \text{ shares}} = 2.970
\]

Per Share 50,000 + 500 = 50,500 shares

Second Variation:

Dilution Determination:
Quarter 4: $20 exercise price < $40 market price Dilutive
Quarter 3: $20 exercise price > $19 market price Anti-Dilutive
Quarter 2: No dilution determination necessary
Quarter 1: No dilution determination necessary

Incremental Shares:
Quarter 4: \[
\frac{10,000 - \frac{200,000}{40}}{10,000 - 5,000} = 5,000
\]
Quarter 3: - 0 -
Quarter 2: - 0 -
Quarter 1: - 0 -

Four Quarter Average: \[
\frac{5,000 + 0 + 0 + 0}{4} = 1,250
\]

Primary Earnings: \[
\frac{160,000 - 10,000}{50,000 + 1,250} = \frac{150,000}{51,250 \text{ shares}} = 2.927
\]

Per Share 50,000 + 1,250 = 51,250 shares
variations of the quarterly technique. Under the first technique, dilution determination begins with Quarter 1 (dilutive) and proceeds to Quarter 2; at which point the process ceases because of Quarter 2's anti-dilutive status. Incremental shares are determined only for the one dilutive quarter, Quarter 1 (2,000 shares), with the other three quarters assumed to have zero incremental shares. The overall quarterly average (500 shares) is utilized in calculating PEPS.

The second variation begins dilution determination with Quarter 4 (dilutive) and ceases the procedure when Quarter 3 is found to be anti-dilutive. Incremental shares for Quarter 4 (5,000 shares) are averaged with the zero incremental shares for Quarters 3, 2, and 1 to determine the overall quarterly average (1,250 shares).

PEPS calculated via the first variation ($2,970) and PEPS via the second variation ($2,927) are each greater than the PEPS figure calculated under the quarterly technique in Figure 3. This difference results from a smaller number of incremental shares being included in the PEPS calculation for each of the variations. Both variations produce a PEPS figure which is within 3 percent of SEPS which increases the probability of applying the 3 percent materiality provision of APB 15 (depending on the interpretation of that provision being followed). Thus no material dilution may be reported for PEPS for a firm utilizing either of these variations.

Recap

The preceding overview of selected provisions of APB 15 supports the contention that alternative interpretations of APB 15 exist. The discussion of alternative interpretations of these selected provisions
highlights the diversity and lack of standardization in EPS computations. The existence of so many alternatives further complicates an already complex calculational procedure.

Tables 1 and 2, on the next page, recap the EPS figures calculated/reported in the examples presented in this chapter illustrating the alternative interpretations of the four selected APB 15 provisions. Table 1 contrasts the PEPS and FDEPS figures which would be reported under each of the three discussed interpretations of the 3 percent materiality provision. In addition, this table presents the EPS figures which would be reported for the example illustrating the future expectation exception to the 3 percent materiality provision. Table 2 reviews the PEPS figures calculated via the alternative approaches to the no anti-dilutive security provision. The table also compares the PEPS figures computed under the alternative techniques to determining the dilutive status of warrants/options.

As the figures presented in Tables 1 and 2 indicate, different EPS figures result from the application of different interpretations of the provisions by different accountants and different firms. As a result, comparability of EPS among firms is lessened. Briner [1976] has concluded that the existence of alternative measures of EPS for a firm decreases the relevance of such figures for investor decisions. The next section discusses selected efforts by accountants to interpret the provisions of APB 15.

**Interpretational Guides to APB 15**

Since the issuance of APB 15 in 1969, many attempts have been made to interpret the provisions of the Opinion. Some of these inter-
## TABLE 1

### REPORTED EPS FOR EXAMPLES

<table>
<thead>
<tr>
<th>Provision:</th>
<th>Reported as:</th>
<th>SEPS</th>
<th>PEPS</th>
<th>FDEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Percent Materiality Provision</td>
<td>Interpretation 1</td>
<td>$3,000</td>
<td>$2,884</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interpretation 2</td>
<td>$2,950</td>
<td>$2,884</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interpretation 3</td>
<td>$2,950</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Future Expectation Exception</td>
<td>Material Dilution Expected</td>
<td>$2,950</td>
<td>$2,884</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Immaterial Dilution Expected</td>
<td>$3,000</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

## TABLE 2

### CALCULATED PEPS FOR EXAMPLES

<table>
<thead>
<tr>
<th>Provision:</th>
<th>Reported as PEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Anti-Dilutive Security Provision</td>
<td>Aggregate Approach</td>
</tr>
<tr>
<td></td>
<td>Sequential Approach</td>
</tr>
<tr>
<td>Warrant/Option Dilution Determination Provision</td>
<td>Annual Technique</td>
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<td></td>
<td>Quarterly Technique</td>
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<tr>
<td></td>
<td>Variation 1 - Quarterly Technique</td>
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<tr>
<td></td>
<td>Variation 2 - Quarterly Technique</td>
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pretations have been very broad in scope, encompassing all areas of EPS computations. Others have been more narrow, limiting their perspective to only one aspect of the computation. The following paragraphs discuss selected attempts to interpret APB 15.

As discussed in Chapter II, the APB's Unofficial Accounting Interpretations of APB 15 [Ball, 1970] represent the major attempt of the accounting profession as a whole to comprehensively interpret APB 15's provisions. As noted, subsequent APB and FASB interpretations have been much more narrow in scope. (These interpretations are discussed further in Chapter II, pages 22-24.) However, these interpretations represent only one source of possible insight into the intricacies of APB 15.

Individual accounting scholars/researchers have also endeavored to interpret the provisions of APB 15 and have propounded their ideas in journal articles, etc. Many attempts have been made over the years to provide frameworks to simplify and illustrate the calculation of EPS. Each of the resulting frameworks reflects the individual perceptions of its developer. Rather than universal acceptance of any one framework, the current calculational methods reflect a hodgepodge of all viewpoints.

One of the first frameworks was developed by Bird and Jones [1970] who presented a decision-tree approach to use in teaching the calculation of EPS per APB 15. Under their approach, all securities are assumed to be dilutive which is contrary to the APB 15 requirement of an annual dilution determination for each security. Bird and Jones indicated that their decision trees provide a starting point for each accounting instructor to develop her/his own model of EPS through her/his own interpretation of APB 15. This attitude has, perhaps,
contributed to the current confusion concerning EPS computations.

A unique approach to interpreting APB 15 was propounded by Huefner [1972] who illustrated a system of accounts and journal entries to be used to maintain the data necessary to compute EPS. In his opinion, utilization of his proposed rules and account titles both facilitated EPS calculation and provided for data continuity. He noted that APB 15 does not specify utilization of either the aggregate approach or the sequential approach, that both approaches are found in practice, and that EPS depends upon the approach applied. Huefner's system of new and unique account titles, journal entries, and procedures complicates an already complex procedure and increases the burden of the accountant.

In order to lessen this burden, researchers have proposed various approaches in order to clarify APB 15. For example, Fischer and Gregorcich [1973] attempted to clarify the EPS calculation by proposing a cumulative adjustment procedure. They indicated that application of their approach enables the accountant to organize the needed data and to understand the basic tenets of APB 15. In their opinion, utilization of their procedure allows for the integration of a highly complex calculation into a practical marriage of theory and application.

Another attempt to present the requirements of APB 15 in some semblence of order was made by Matulich, Nikolai, and Olson [1977]. The authors presented a flowchart approach to teaching EPS calculations which they believe simplifies the learning of EPS and enables more complex EPS areas to be discussed. However, the flowcharts themselves are difficult to follow and the steps included represent the authors' interpretations of the guidelines. According to Stephens [1978],
Matulich, Nikolai, and Olson [1977] misinterpreted the 20 percent rule under the treasury stock method and thus omitted a portion of the method. Stephens then suggested modifications that each individual should make to the original flow chart in order to correct for this. Thus, by endeavoring to clarify the EPS calculation, Matulich, Nikolai, and Olson as well as Stephens further complicate an already complicated procedure.

Efforts have been undertaken in order to simplify the EPS calculation per APB 15 and to provide a more efficient computational procedure. For example, Davidson and Weil [1975] believe that APB 15 requires too many steps in determining anti-dilutive convertible securities and, thus, have developed their own version of the necessary procedures. Their shortcut includes considering dilutive securities in the computation of EPS one at a time. Kilpatrick, Putnam, and Schneider [1985] have modified the Davidson/Weil approach. The revised shortcut includes all dilutive securities at once and then eliminates the ones subsequently determined to be anti-dilutive. Both of these shortcuts attempt to reduce the number of steps in the EPS calculation, but both fail to provide new insights into the provisions of APB 15.

Harmelink and Posey [1976] also endeavored to more efficiently calculate EPS through a worksheet approach and a step-wise EPS computation. Their illustrative cases exemplify some of the problems/questions resulting from the ambiguity of APB 15 [p. 8]. The authors concluded that their worksheet approach provides an excellent basis for explaining EPS to practitioners; however, they noted the need for further supplemental explanatory materials.

Financial managers, accountants, and security analysts interpret
income items differently although all are familiar with the terms [Siegel, 1982]. Accounting researchers often provide differing and sometimes conflicting approaches to the application of the rules. Oftentimes, the approaches/interpretations appear to advocate procedures which are contrary to APB 15. For example, Stancill's [1982] interpretation of the treasury stock method includes convertible securities, warrants, and options as being subject to the approach (which is contrary to APB 15). Furthermore, his view of APB 15 requires only one EPS figure to be presented when the method is utilized.

As the preceding discussion illustrates, many individuals have attempted to simplify and clarify the application of APB 15. The existence of so many frameworks, each professing to have the same objective, may increase the confusion and, perhaps, foster misinterpretation of the Opinion. The next section reviews a major source of EPS computational interpretations, intermediate accounting textbooks, in order to determine which approaches are being taught to aspiring accountants.

**Textbook Approaches to EPS Computations**

Accounting textbooks provide one means of explaining accounting principles and procedures. Intermediate accounting textbooks, in particular, attempt to interpret and disseminate the EPS computational provisions of APB 15. This section briefly reviews major intermediate texts in use in American colleges and universities since the issuance of APB 15. The reviews are restricted to the computational rules explained previously.

Four series of intermediate accounting textbooks have been selected
for review (see Figure 5). Based on interviews with accounting textbook editors, discussions with publishing company book representatives, surveys of references in unofficial answers to CPA examinations, and reviews of references in CPA examination review manuals, these texts are the ones most frequently referenced and most heavily utilized. Currently, they account for over ninety percent of the intermediate accounting textbook market. The chart in Figure 5, on the next page, indicates the time period during which each edition of the four major texts was in use.

**Simons/Karrenbrock-Smith/Skousen Series**

The Fourth Edition [1964] and all subsequently published editions [1972, 1977, 1981, 1984] of the Smith/Karrenbrock-Smith/Skousen Series have been reviewed to determine to what extent each covers the highlighted provisions. Although the Fourth Edition [1964] was first published five years prior to APB 15, use of this edition continued for three years subsequent to the Opinion's issuance. Understandably, coverage of EPS in this edition was not totally in compliance with APB 15.

The impact of APB 15 is first noted in the Fifth Edition [1972] with each successive edition providing more extensive coverage of EPS calculations than its predecessors. Each of these editions discusses the 3 percent materiality provision, but the application of the provision is generally illustrated only for PEPS. While each edition illustrates the treasury stock method, no clear indication is ever given as to whether quarterly or annual prices should be utilized. The calculation of EPS for a firm with multiple potentially dilutive securities is
FIGURE 5

MAJOR INTERMEDIATE ACCOUNTING TEXTBOOKS

Authors/Edition:

Simons and Karrenbrock [Fourth]
Simons [Fifth]
Simons, Revised by Smith and
Skousen [Sixth]
Smith and Skousen [Seventh]
[K Eighth]

Kieso and Weygandt [First]
[Second]
[Third]
[Fourth]
[Fifth]

Welsch, Zlatkovich, & White [Third]
[Fourth]
Welsch, Zlatkovich, & Harrison [Fifth]
[Sixth]
Welsch, Newman, & Zlatkovich [Seventh]

Meigs, Johnson, Keller, & Mosich [Second]
Meigs, Mosich, Johnson, & Keller [Third]
Meigs, Mosich, & Johnson [Fourth]
Mosich and Larsen [Fifth]
[S Sixth]

Years of Edition Usage:

69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86

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56
first explained in the Sixth Edition [1977]. The sequential approach is advocated in that and all subsequent editions.

This series of intermediate texts appears to be fairly consistent as to which interpretations of APB 15 provisions are being applied. In general, the provisions they have selected to include are covered extensively. However, some APB 15 provisions as well as details of others are omitted from the explanations of EPS altogether.

**Kieso/Weygandt Series**

The Kieso/Weygandt Series, beginning with the First Edition in 1974, provides fairly in-depth explanations of the reporting and computational aspects of EPS. In each edition EPS coverage is extensive with a comprehensive example provided to clarify procedures. However, comparisons of narrative, flowcharts, and examples illustrates possible inconsistencies in their presentation of APB 15 provisions. This situation occurs most frequently in conjunction with the 3 percent materiality provision.

Regarding the treasury stock method, none of the editions clearly specifies which stock prices are to be utilized in applying this method. Kieso and Weygandt advocate the aggregate approach in the first three editions of their text [1974, 1977, 1980]. However, they alter their explanation in the Fourth [1983] and Fifth [1986] Editions and adopt the sequential approach.

The Kieso/Weygandt Series provides a fairly comprehensive coverage of EPS and appears to reflect a meticulous approach to the calculations. However, details of some procedures are omitted from the explanations. The switch from advocating the aggregate approach to espousing the
sequential approach reflects a change in Kieso/Weygandt's interpretation of the no anti-dilutive security provision of APB 15. In some cases, therefore, the interpretation of this provision being followed by accountants may depend upon the text edition she/he utilized.

Welsch, et al, Series

The Welsch, et al, Series initially devoted little attention to EPS. In the Third Edition [1972], the authors note that APB 15 is an extremely complex Opinion which requires a lengthy interpretative booklet and opt to omit the majority of calculational details. Only the 3 percent materiality provision is specifically mentioned.

Beginning with the Fourth Edition [1976], the series expands coverage of EPS. However, few computational complexities are addressed in the Fourth Edition and none of the highlighted provisions are specifically mentioned. While this situation is somewhat rectified in the Fifth Edition [1979], the Sixth [1982] and Seventh [1986] Editions reflect a much more detailed coverage of EPS calculations.

Some of the interpretations being followed in the Welsch, et al, Series appear to be unique to the Series itself. In addition, their own adherence to these and other interpretations appears to be inconsistent. For example, the Fifth Edition [1979] states in the example on page 632 that, if PEPS does not reflect 3 percent dilution, then FDEPS need not be reported. However, in the flowchart on page 635, the 3 percent provision is indicated as applying to both PEPS and FDEPS. Later editions interpret this provision as being an optional test; i.e., companies have the option of reporting or not reporting dilution of less than 3 percent.
The Fourth [1976] and Fifth [1979] Editions imply that the aggregate approach is to be followed; however, later editions have adopted the sequential approach. No edition clearly specifies which stock prices to employ in the treasury stock method.

The Welsch, et al, Series has gradually expanded coverage of EPS to include most of the major provisions of APB 15. As is the case with the other text series reviewed, computational details of some APB 15 provisions are somewhat lacking. The inconsistent coverage exhibited by the Welsch, et al, Series, particularly in the interpretation of the 3 percent materiality provision and the no anti-dilutive security provision, further supports the idea that text edition utilized may influence EPS calculations.

Meigs/Mosich, et al, Series

The Second Edition [1968] of the Meigs/Mosich, et al, Series, published prior to APB 15, notes the existence of potential dilution and illustrates pro forma calculations to recognize such dilution. However, none of the reporting and calculational provisions which subsequently appeared in APB 15 are described.

Coverage of EPS is expanded in the Third [1974] and subsequent editions [1978, 1982, 1986]. Existence of the 3 percent provision is noted and its application illustrated. However, the Third Edition [1974] implies that the provision also applies to individual warrants/options. None of the editions illustrates either the sequential or the aggregate method; thus the decision of how to include multiple dilutive securities in EPS calculations is left unaddressed. This Series, however, is the only one of the four reviewed that specifies which stock prices are to
be utilized in the treasury stock method. The Fifth [1982] and Sixth [1986] Editions illustrate the annual technique, but indicate that, under APB 15, the quarterly technique is to be utilized.

The Melgs/Mosich, et al, Series explains the APB 15 provisions that they have selected in a fairly consistent manner. However, this series also suffers from some inconsistency of coverage (as noted) and omission of details/provisions (as do all of the texts reviewed).

As can be seen from the preceding review, intermediate accounting textbooks have been inconsistent in their interpretations of APB 15. This is true not only among competing textbooks, but also among the different editions of a particular text. Thus the practicing accountant's interpretation and application of the EPS rules may be highly dependent upon the particular intermediate text or text edition used in undergraduate or graduate coursework.

As noted, the resulting EPS may therefore be computed differently by different accountants, producing noncomparable EPS figures. The consequences of such a situation may best be understood by viewing EPS as a signal from management. The next section explains the role of EPS in signalling theory and explores the consequences which may result from the existence of alternative interpretations of APB 15 provisions.

**EPS Signal From Management**

EPS is a product of a firm's accounting process which supplies data about that firm's activities. Gonedes [1972] has characterized this process as one whose output consists of numbers with information potential. EPS and other accounting numbers reflect information about a firm's operations which may be utilized in decision-making. The
following sections elaborate on this aspect of the financial reporting of EPS. First, the theory underlying the role of EPS as a signal from management is discussed and, secondly, possibilities for false EPS signals are considered.

**Signalling Theory**

Signalling theory is a financial theory which holds that accounting numbers which vary as a result of changes in underlying firm characteristics (such as EPS) may be viewed as signals from management of unobservable firm attributes [Gonedes, 1978]. Under this theory, investors behave as if the reported accounting numbers are signals about attributes (characteristics) of firm decisions and act as if the signals reflect information about the distribution of a security's future returns [Gonedes, 1975; 1978]. Investors then base their risk assessment of a security on their interpretations of signals transmitted by management through the reported accounting numbers [Copeland and Weston, 1980; Gonedes, 1975]. According to signalling theory, the importance of a signal such as EPS therefore depends on its ability to influence investor perceptions of unobservable firm attributes, which perceptions are subsequently reflected in security prices [Gonedes and Dopuch, 1974; Ross, 1977].

EPS may thus be utilized via signalling theory as a signal from management. The EPS signal provides covert information about the underlying characteristics of a firm's profit-making activities. Investors may apply various analytical procedures in order to extract the pertinent information from the EPS signal.

One such method of interpreting the EPS signal is to apply an EPS*
criterion. According to this approach, EPS* is assumed to reflect a critical level of EPS that has been identified by the market [Copeland and Weston, 1980]. Firms with reported EPS in excess of EPS* are perceived by the market as being successful. Alternatively, firms whose reported EPS is lower than this critical level are viewed as being unsuccessful [Ross, 1977]. For example, assuming EPS* is $3.00, a firm whose reported EPS is $3.75 would be identified by the market as a successful firm. Conversely, a firm with reported EPS of $2.66 would be considered unsuccessful.

Based on the EPS* criterion in conjunction with signalling theory, EPS may be viewed as a signal to the market about the success of a firm with possible price revision resulting from the signal's interpretation. Thus market equilibrium depends both on the availability of signals and the ability of the market to interpret them [Gonedes, 1975; Griffin, 1976; Ross, 1977]. Adherence to the EPS* criterion view provides management with incentives to report the highest EPS figure possible and, perhaps, even to issue false signals [Seidler, 1972].

False Signalling Possibilities

Management is the key in determining EPS and other disclosures [Hakansson, 1981]. Reported EPS and the accounting techniques for computing EPS may serve as signals concerning unobservable facets of company decisions [Gonedes, 1976]. Knowing that the market reacts to the reported figures, managers may create false signals in order to achieve a desired behavior. Stancill [1982] noted that EPS often depends on management's determination of an appropriate EPS figure. He indicated that management undertakes various activities to achieve
their EPS goal, perhaps even selecting EPS calculational approaches favorable to their position.

As has been discussed in this chapter, multiple interpretations of APB 15 provisions exist. Accordingly, management's perceptions of how EPS affects investor inferences may determine which interpretation of each provision management selects to follow in calculating and reporting EPS. As has been illustrated, the interpretation being followed in determining EPS affects the firm's reported EPS figure. Thus, management may calculate/report EPS in such a manner as to influence the behavior of investors.

Theoretically, calculational and disclosure pronouncements such as APB 15 should allow investors to more easily interpret management signals by standardizing such signals. Standardization implies a consensus approach; however the existence of alternative interpretations of APB 15 provisions belies such a situation of standardization in EPS calculations. As has been seen, none of the interpretations has been adopted as the consensus approach. Thus the potential exists in the calculation of EPS for misleading or distorted management signals to be reported.

Management may use different interpretations of APB 15 provisions to "smooth" or "manage" EPS in order to enhance investor confidence through the reporting of stable earnings [Gonedes and Dopuch, 1974]. Even if this is not the case, different interpretations may produce misleading results because of the market reaction to differences in reported EPS figures.

The existence of alternative interpretations of APB 15 provisions becomes important in view of the possibility that both firm and investor decisions may change under different interpretations of the
same provision of APB 15. Abdel-khalik [1972] noted that, although the market reacts systematically and without bias to signals produced by accounting data, the reaction to a given signal may not be the same as the one produced by an alternative accounting measurement of the same signal. Both reactions will be efficient, but not necessarily the same. In light of the numerous interpretations of APB 15, the computational and reporting validity of EPS is subject to question.

Summary

This chapter has examined selected provisions of APB 15 and noted their alternative interpretations. A selected review of the efforts of accounting researchers to interpret the provisions of APB 15 has been provided. As indicated, various interpretational guides and frameworks exist with a noted lack of consistency among them. Intermediate accounting textbooks and text editions also suffer from this inconsistency. This situation raises questions concerning the underlying calculational procedures being utilized by accountants in computing the EPS figure and may result in a lack of standardization in the computation of EPS. Accordingly, the EPS figures produced may not, in reality, be comparable as a result of differing calculational interpretations being followed.

The importance of producing comparable EPS figures is illustrated by the relationship between EPS and stock prices. As was discussed in the previous chapter, the EPS figure has been shown to possess information content, and thus empirical evidence supports the existence of this relationship. As noted, management may behave in a manner designed to exploit this relationship. Perceived differences in reported EPS
may be due to actual differences between firms or they may be due to differences in firm EPS calculational approaches.

EPS, as noted, is utilized by investors as a signal of underlying firm attributes. Inferences by investors concerning one firm's decisions and underlying attributes may depend on the inferences made by the same investors about other firms' decisions and attributes [Gonedes, 1978]. Accordingly, comparisons of EPS signals are a key element in the allocation of resources in the market.

The quality of such EPS signals plays an important role in the resource allocation process. Singhvi and Desai [1971] found that inadequate disclosures may result in greater price fluctuations as a result of less objective evidence. Such fluctuations ultimately affect the allocation of resources in the economy. Beaver and Demski [1974] supported this observation and indicated that financial statement information (such as EPS) affects both the exchange and production sectors of the economy. Thus, actions based on the reported EPS may produce a misallocation of resources resulting in firms being penalized or overly compensated as a consequence of the APB 15 calculational approach they utilize.

Because of its importance, the reported EPS figure should be consistently calculated and comparable across companies. This study has attempted to determine if such a situation exists and has examined the consistency of EPS calculational procedures among preparers of the EPS figure. The next chapter outlines and discusses the formal research question under investigation as well as the methodological approach undertaken in this study in order to provide the answer.
CHAPTER IV

METHODOLOGY

This chapter discusses the methodology that was utilized in this study to determine if the provisions of APB 15 provide for the consistent reporting of comparable EPS figures across preparers of financial statements. The chapter includes (1) a discussion of the research hypotheses, (2) a discussion of the study's subjects including the sampling procedures utilized, (3) a description of the research instrument and the related task, and (4) a discussion of the cases in the study including case variables and statistical analysis procedures. The chapter concludes with an explanation of the mailing procedures followed including response rate enhancement procedures/strategies.

Research Hypotheses

The preceding review of existing literature suggests that considerable confusion and controversy exists over the computation of EPS. Alternative interpretations of APB 15 may reduce the comparability of EPS across preparers of financial statements. Consequently, the primary research question addressed in this study is as follows:

Do the provisions of APB Opinion No. 15 provide for consistent reporting of comparable EPS figures across preparers of financial statements?

Consistent application of one interpretation of a particular provision would suggest that a consensus concerning the calculation of EPS has
been achieved within the accounting profession. Of course, this consensus may exist for one, some, all, or perhaps none of the provisions of APB 15. In order to address this question, the following formal hypotheses, stated in alternative form and grouped by specific provision of APB 15 have been investigated:

3 Percent Materiality Provision

Hypothesis 1: Preparers of EPS favor at least one interpretation of the 3 percent materiality provision required by APB 15 [*15] in reporting EPS on the financial statements.

Future Expectations Exception

Hypothesis 2: The future expectation exception to the 3 percent materiality provision of APB 15 [*17] is not applied when material (> 3%) future dilution is expected.

Hypothesis 3: The future expectation exception to the 3 percent materiality provision of APB 15 [*17] is not applied when immaterial (< 3%) future dilution is expected.

No Anti-Dilutive Security Provision

Hypothesis 4: Preparers of EPS favor at least one interpretation of the no anti-dilutive security provision of APB 15 [*30, *40] in calculating PEPS.

Hypothesis 5: Preparers of EPS favor at least one interpretation of the no anti-dilutive security provision of APB 15 [*30, *40] in calculating FDEPS.

Warrant/Option Dilution Determination Provision

Hypothesis 6: Preparers of EPS favor at least one interpretation of the warrant/option dilution determination provision of APB 15 [*36, *42] in the calculation of PEPS.

Hypothesis 7: Preparers of EPS favor at least one interpretation of the warrant/option dilution determination provision of APB 15 [*36, *42] in the calculation of FDEPS.
Subjects

The stated hypotheses clearly indicate that the appropriate individuals from whom to elicit responses for this study are preparers of EPS. This section of the chapter is divided into two subsections. The first subsection presents and justifies the selected focal population. The second subsection addresses the sampling procedures that were necessary to enhance the validity of the data obtained.

Focal Population

A survey of the EPS literature indicates that the EPS figure may not be calculated by any single group, but rather by individuals within several groups. Therefore, the groups involved with EPS must first be identified and then the individuals within each group responsible for the task must be segregated. The primary groups include financial analysts, accountants, and bankers.

Accountants. Accountants are generally acknowledged as the primary preparers of financial information [APB, 1969; Hofstedt and Hughes, 1977]. The term "accountants" refers to a group of individuals with a broad spectrum of activities and requires further refinement. In order to investigate the computational/reporting approaches utilized by the accounting preparers of EPS (referred to hereafter as preparers), representative groups of preparers were identified.

Certified Public Accountants (CPAs) assess the credibility of the financial statements (and EPS) through the audit process. As independent auditors, CPAs may actually prepare the EPS figures reported on the financial statements [Griffin, 1976]. Consequently, CPAs were one identified category of preparers.
Independent CPAs are not the only accountants actively involved with the financial statements and the preparation of EPS. Corporate accountants interpret the output of the company information system in order to present concise and effective answers to executive management [Burger and Webster, 1978]. Thus corporate accountants were the second category of preparers.

Accounting academicians, although not directly involved in the calculation of EPS in external financial reports, nevertheless influence its computation. The majority of accountants in both preparer groups are generally first exposed to EPS calculations in their undergraduate accounting courses. This initial exposure may provide the foundation for the preparer's later computational applications. Thus, indirectly through their influence on future CPAs and corporate accountants, accounting academicians are preparers of EPS [Mayer-Sommer, 1979]. Accordingly, accounting academicians were included as a third category of preparers.

No sampling frame existed that specifically identified accountants primarily involved in the computation of EPS. A general sampling frame was the only available identification for each group.\(^1\) Therefore, a variety of procedures were utilized to identify each population based on judgmental factors.

The sampling frame for CPAs consisted of partners, professional corporation shareholders, and employees of public accounting firms

\(^1\)Such centralized master directories eliminate element (i.e., name) duplication and expose each element in the list to a known selection probability [Frankel and Frankel, 1977]. The directory used for each accountant group provided information concerning the name, address, firm/university affiliation, and title (in most cases) for each member.
identified in the American Institute of Certified Public Accountants (AICPA) List of Members 1984. The first restriction placed on this sampling frame was to omit sole practitioners. Due to the nature of their practices, sole proprietors are rarely concerned with EPS. A second restriction limited the sampling frame to only those CPAs practicing in the United States.

The sampling frame for corporate accountants consisted of the controllers/assistant controllers and managers/directors of financial reporting identified in the AICPA List of Members 1984. The sampling frame for corporate accountants was limited to accountants employed by companies incorporated in the United States.

The sampling frame for academicians was provided by the Prentice-Hall Accounting Faculty Directory 1985 [Hasselback, 1985]. The sampling frame was limited to faculty from United States universities listed in the Directory who indicate their primary area as financial accounting. Although other faculty may be familiar with EPS, it was felt that only those faculty who teach in the financial area possess a working knowledge of the provisions of APB 15.

Preparers of EPS. Not all subjects identified by the general sampling procedures outlined above possess a working knowledge of APB 15. Accordingly, techniques were utilized to segregate those accountants from the general frames who are involved with the EPS procedure. These techniques required a two-phase mailing procedure. The first phase, or mailing, allowed for an estimation of the percentage of preparers within each group, and the second phase, or mailing, collected the data via the measurement instrument.
For the first mailing, a systematic random sample of 1,000 accountants was selected to gain insight concerning the proportion of preparers in each accountant group in order to identify the population of preparers. Approximately 77,000 CPA/auditors (CPA), 20,000 corporate accountants (CA), and 3,000 accounting academicians (AA) were tentatively identified as possible preparers by the general sampling procedures. Proportional allocation was utilized to determine how many of the 1,000 subjects were to be selected from each of the three accountant groups [Cochran, 1977; Scheaffer, Mendenhall, and Ott, 1979]. For each group, systematic sampling techniques with one random number start were utilized. Every 100th name from each starting point was selected. This procedure resulted in the selection of 770 CPAs, 200 CAs, and 30 AAs.

A letter was sent to each of these 1,000 subjects explaining the research study and requesting their assistance. Accompanying the letter was a postcard on which the subject was to indicate if she/he (1) computes EPS/agrees to participate; (2) computes EPS/does not wish to participate; or, (3) does not compute EPS/does not wish to participate. The letter emphasized the importance of returning the postcard whether or not the subject chose to participate. In addition, the letter indicated that those who returned the postcard and who did not wish to participate would not be contacted any further. The letter and postcard are presented in Appendix A.

Since the sampling frames used in this study were general frames, the utilization of the postcards in the first mailing provided an estimate of the "true" population of preparers of EPS [Cochran, 1977; Scheaffer, Mendenhall, and Ott, 1979]. For example, receipt of 200
postcards from one group with 120 of these respondents indicating that they are involved in the EPS procedure would warrant a conclusion that approximately 60 percent (i.e., 120/200) of the total population is part of this study's sampling frame for that group.

The validity of the 60 percent figure in the example is based on several assumptions. For example, the figure assumes that preparers and non-preparers are equally likely to return the postcard. However, it is reasonable to assume that preparers are more willing to respond than non-preparers. Thus, the estimate is likely to be upwardly biased and the conclusions drawn more conservative.

Another assumption is that the sampling frame itself is complete (i.e., all members of the population are included in the frame). Chance frequently determines if the units from the sampling frame which are of actual interest in the study are contacted. Thus, the estimated figure may vary as a result of sampling rather than contacting all elements in the sampling frames. These, however, are general limitations of sampling and of using any sampling frame [Cochran, 1977]. Utilization of probability sampling techniques helps to minimize this variation. As noted previously, probability sampling was achieved in this study by using systematic random sampling with a random number start.

Sampling theory also assumes that the observations obtained from each respondent are the correct ones for that respondent [Cochran, 1977]. Since this study utilized a self-administered approach, the assumption was made that participants answered honestly and to the best of their ability. If respondents incorrectly indicated their familiarity with EPS procedures, then the estimate is upwardly biased
again resulting in more conservative conclusions.

Utilization of the postcard to identify preparers also provided for a better assessment of non-response bias. Many subjects who failed to respond did not possess a working knowledge of EPS and, thus, should be eliminated from the study. However, not all non-respondents fell outside the realm of preparer. By utilizing the figure as an estimate of the "true" population of preparers, a better assessment of the "true" bias resulting from the non-response of preparers was made. This helped to minimize the extraneous bias resulting from the non-response of the non-preparers. The results of the first mailing are discussed in Chapter V.

Sample

An investigation of the EPS calculational/reporting approaches being applied in practice required the selection of a sample of preparers. Based on the estimated population of preparers derived from the first mailing, the sample size was determined and subjects were chosen. The following sections discuss the specific procedures used in each of these areas.

Sample Size. Identification of the preparer groups required the use of stratified sampling techniques. Since this study investigated the proportion of preparers following the various APB 15 procedures/interpretations, the appropriate sample size was derived by estimating the population proportion utilizing each interpretation of the APB 15 provision being investigated. The following formula for determining the sample size in a proportionally allocated stratified random sample for proportions was utilized to ascertain the appropriate sample size
for each provision under investigation [Cochran, 1977; Scheaffer, Mendenhall, and Ott, 1979]:

\[ n = \frac{n_0}{1 + \frac{n_0}{N}} \]

and,

\[ n_o = \frac{\sum_{h=1}^{L} \frac{w_h p_h q_h}{v}}{v} \]

where,

- \( n \) = the number of units in the sample
- \( N = N_1 + N_2 + \ldots + N_L \); the total number of units in all \( L \) strata
- \( W_h = \frac{N_h}{N} \); the fraction of total units in stratum \( h \)
- \( N_h \) = the total number of units in stratum \( h \)
- \( B \) = the bound on the error of estimation of the proportion such that \( P \{ | \hat{\theta} - \theta | \leq B \} = 1 - \alpha \)
- \( \theta \) = the true proportion of the population with the identified characteristic
- \( \hat{\theta} \) = the estimator of population proportion \( \theta \)
- \( V = \frac{B^2}{4} \); the desired variance of population proportion \( \theta \)
- \( p_h \) = the proportion of stratum \( h \) with the identified characteristic
- \( q_h = 1 - p_h \); the proportion of stratum \( h \) without the identified characteristic
The techniques utilized in the first mailing provided revised estimates of the number of preparers in each of the three accountant groups. These revised $N_h$ figures were used in determining the appropriate sample size for each provision.

As the literature survey indicates, previous research has not dealt extensively with the individual accountant's actual understanding and application of APB 15. Therefore, no information was available to indicate the proportion of accountants who actually followed a particular EPS calculational procedure/interpretation. As a result, a worst case scenario was adopted with $p_h$ assumed to be 50 percent for each provision being investigated. This assumption resulted in a maximum sample size being determined for each provision [Scheaffer, Mendenhall, and Ott, 1979, p. 88, p. 186].

Based on an arbitrary alpha level of .05, a 95 percent confidence interval, and a 10 percent bound on the proportion, a preliminary sample size of 100 responses per case was determined. If actual responses per case exceed this preliminary estimate, then the actual bound will be less than 10 percent and vice versa. Determination of the actual bound for the data in each case is discussed in Chapter V.

Sample Selection. As noted previously, a two-phase mailing approach was utilized in this study. The procedures followed in the first mailing to identify preparers have been described. The second mailing consisted of a mailout of the measurement instrument to the sample of preparers from each of the three accountant groups.

The sample included the respondents from the first mailing who indicated that they were preparers and would participate in the study and also included those subjects from the first mailing who failed to
return the postcard. The letter accompanying the postcard stressed the importance of responding and indicating participation status. Failure to return the postcard was viewed as tacit agreement on the part of the subject to participate in the study.

Additional subjects were selected from the three appropriate accountant groups via systematic random sampling techniques. The number of additional subjects from each group was ascertained after considering the explicit and implicit respondents from the first mailing and after determining the appropriate sample size.

**Measurement Instrument**

The evaluation of the EPS calculational/reporting procedures employed by preparers poses numerous problems. A preparer may know the rules in theory, yet not apply them in reality. Such an individual may telescope her/his replies and thus bias the results. As a result, a direct query concerning a person's degree of application of the rules specified in APB 15 is questionable. The research instrument, therefore, must be capable of capturing individual perceptions relating to different facets of EPS calculation and reporting.

Data for this study was gathered via a questionnaire developed specifically for the EPS area. Incorporation of certain computational/reporting provisions of APB 15 required the presentation of cases designed to assess the computational/reporting procedures. The provisions selected may be misinterpreted and thus misapplied in practice, producing EPS figures that are not comparable. Thus false signaling may result and the market may be misled. The questionnaire was designed to discern if such a situation exists.
General Overview of Instrument

The test instrument consisted of three parts: (1) an introductory paragraph giving the basic instructions, (2) the case to be analyzed, and (3) a set of demographic questions. The cases developed examined application of the EPS computational/reporting provisions of APB 15 by preparers.

The EPS computational provisions selected for investigation may produce noncomparability of the EPS figures between companies as a result of differing EPS calculational/reporting provision interpretations. This study examined the following APB 15 provisions: (1) the 3 percent materiality provision [¶15], (2) the future expectation exception to the 3 percent materiality provision [¶17], (3) the no antidilutive security provision [¶30, ¶40], and (4) the warrant/option dilution determination provision [¶36, ¶42].

In order to simplify the research instrument, to avoid possible confounding of the provision effects, and to facilitate data analysis procedures, each of the provisions was examined in a separate case. Accordingly, four basic cases were developed to examine these computational and reporting provisions.

Accompanying each case was a biographical data sheet designed to collect certain demographic characteristics of preparers. This data included (1) type of primary employment, (2) length of EPS association, (3) professional certifications, and (4) education. CPAs were asked to indicate (1) type of CPA firm, (2) position in firm, and (3) firm EPS calculational approach. CAs were requested to indicate (1) type of firm, (2) position within firm, and (3) types of potentially dilutive securities their firm has outstanding. AAs were asked to
indicate their EPS teaching experience as well as textbooks utilized. Appendix H presents the demographic portion of the questionnaire.

Task

Subjects were asked to determine the EPS presentation they would report based on quantified information from supplied cues. To avoid possible confounding effects resulting from identification of a real company, each company represented was a hypothetical one whose name consisted of a randomly selected group of letters. No details concerning company industry, geographic location, etc., were provided to avoid possible preconceptions on the part of subjects.

The cues in each case presented actual EPS figures that had been calculated under different assumptions/interpretations as well as some of the basic information necessary to calculate EPS for the case. Overall, the structure of each case followed the same basic pattern which was adapted to investigate each specific provision. The subject's task in each case involved three major components:

1. selection of the PEPS figure she/he would report on the financial statements;
2. selection of the FDEPS figure she/he would report on the financial statements; and,
3. explanation of the reasons for her/his selections.

Prior research indicates that the length of the questionnaire affects the response rate with longer lengths associated with lower rates [Blumberg, Fuller, and Hare, 1974; Linsky, 1975]. In order to keep the length of the questionnaire to a minimum, only one case was sent to each subject. This also eliminated any covariation among the cases. In addition, all EPS figures included in the cases had been
calculated in advance and presentation of such figures included descriptive calculational captions. Subjects, therefore, only had to perform a minimum amount of mathematical calculations. These approaches avoided overburdening the subjects and thus contributed to a higher response rate and easier data analysis.

The task was one with which the subjects are highly familiar [Griffin, 1976; Burger and Webster, 1978]. A substantial part of each subject's job is to summarize, condense, and review large amounts of financial information and to calculate/review certain summary indicators such as EPS [Hofstedt and Hughes, 1977; Hassell, 1983]. EPS has been shown to be an important variable in the determination of stock prices and, therefore, is an integral component of investor resource allocation decision models. Thus the calculation and reporting of EPS in a field setting is consistent with the normal routine of the subjects.

Cases

This section discusses the cases constructed for this study. To enhance the continuity of this section, each case is discussed in its entirety before proceeding to the next case. The format of each case discussion is as follows: (1) a review of the hypotheses examined in each case, (2) a description of the case specifics, (3) a specification of the case variables, and (4) the statistical procedures used to analyze the case data.

Case 1. The first case examined preparer interpretation of the 3 percent materiality provision [§15] and investigated the following hypothesis (stated in alternative form):
Hypothesis 1: Preparers of EPS favor at least one interpretation of the 3 percent materiality provision required by APB 15 [¶15] in reporting EPS on the financial statements.

Case 1, which is presented in Appendix B, was structured in such a manner that the interpretation of the 3 percent materiality provision being applied in reporting EPS could be identified. Only one common stock equivalent (CSE) and only one other potentially dilutive security (OPDS) were included in the case. No numerical data was presented other than three previously calculated EPS figures (earnings per common share of $3.00, EPS including CSEs of $2.95, and EPS including CSEs and OPDSs of $2.88).

The inclusion of the CSE in the calculation of PEPS resulted in a PEPS figure of greater than 97 percent of Simple Earnings Per Share (SEPS); i.e., dilution was less than 3 percent. FDEPS, which included both the CSE and the OPDS, reflected material dilution when compared to SEPS and was, therefore, less than 97 percent of SEPS. However, the percentage difference between PEPS and FDEPS was less than 3 percent; i.e., FDEPS was greater than 97 percent of PEPS. Thus, the case was structured in such a manner that the 3 percent materiality provision should have influenced the subject in determining what EPS figures to report.

Subject responses to the questions "What earnings per share would you report on the financial statements as SEPS? PEPS? FDEPS?" were used to identify which interpretation the subject followed. Responses to "Why did you report the figures that you selected?" were utilized to verify the interpretation being followed. Subject responses were, therefore, classified into categories corresponding to the various
interpretations of the 3 percent materiality provision. Accordingly, the following variable was determined from each subject's responses to Case 1:

1. The 3 percent materiality provision interpretation utilized in reporting EPS on the financial statements.

The data consisted of frequency counts of preparers following each interpretation and, thus, the nominal level of measurement was achieved.

Pearson's chi-square test of homogeneity was used to test Hypothesis 1 since this statistical test is the most appropriate test to use in this situation [Siegel, 1956; Huck, Cormier, and Bounds, 1974; Andrews, et al, 1981]. A comparison was made between the actual number of preparers applying each interpretation and the number expected to apply that interpretation. The survey of accounting literature indicated that none of the interpretations appeared to have received the unanimous support of all preparers. Thus, no one interpretation of the 3 percent materiality provision was expected to be followed by all preparers. As a result, an equal number of preparers were expected to apply each interpretation.

The chi-square statistic was calculated via the following expression:

\[ \chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i} \]

where,

- \( O_i \) = observed number of preparers applying the \( i \)th interpretation
- \( E_i \) = expected number of preparers applying the \( i \)th interpretation.
- \( k \) = number of interpretations which may be applied.
- \( df = (k - 1) \); number of degrees of freedom.
While the majority of expected frequencies in this study were greater than five, chi-square has been found to be very robust when expected cell frequencies are small [Camilli and Hopkins, 1978; Bradley, et al, 1979]. Thus, the above calculated chi-square was the test statistic utilized throughout all phases of the analysis.

A significant chi-square statistic for Hypothesis 1 indicated that preparers favored at least one interpretation of the 3 percent materiality provision over the other interpretations in reporting EPS. When this occurred, further investigation (i.e., post hoc testing) was undertaken to identify which interpretation was dominant.

**Case 2.** The second case examined subject adherence to the future expectation exception to the 3 percent materiality provision [¶17]. Because of possible inconsistencies in the application of the future expectation exception, the following two hypotheses were investigated (stated in alternative form):

**Hypothesis 2:** The future expectation exception to the 3 percent materiality provision of APB 15 [¶17] is not applied when material (> 3%) future dilution is expected.

**Hypothesis 3:** The future expectation exception to the 3 percent materiality provision of APB 15 [¶17] is not applied when immaterial (< 3%) future dilution is expected.

Case 2, which is presented in Appendix C, utilized the calculated EPS figures from Case 1, but presented two scenarios in order to focus on the future expectation exception. Each scenario included a sentence indicating the future expectation of 3 percent, or material, dilution. Subjects were first asked to report EPS under expected material dilution (i.e., future material dilution of greater than 3 percent expected in the next period). Then they were asked to report EPS under expected
Immaterial dilution (i.e., dilution of less than 3 percent expected in the next period). These two scenarios allowed for the determination of whether the future expectation exception was being applied and, for some subjects, which interpretation of the 3 percent materiality provision was being followed.

Subject responses to the questions "If material dilution is expected next year, what earnings per share would you report on the financial statements as SEPS? PEPS? FDEPS?" were used to identify whether or not the subject followed the future expectation exception when future material dilution was expected. Responses to "Why did you report the figures you selected?" were used to verify the application or non-application of the exception in this circumstance. In addition, subject responses to the questions "If no material dilution is expected next year, what earnings per share would you report on the financial statements as SEPS? PEPS? FDEPS?" were utilized to determine adherence to the future expectation exception in cases of expected future immaterial dilution. Responses to "Why did you report the figures you selected?" were utilized to verify the application/non-application of the exception. Subject responses were, therefore, classified into categories corresponding to adherence to the future expectation exception. Based on the two scenarios presented in this case, the following two variables were determined for Case 2 respondents:

2. Implementation of the future expectation exception under expectations of material future dilution.

3. Implementation of the future expectation exception under expectations of immaterial future dilution.

The data consisted of frequency counts of preparers following/not following the future expectation exception, and, thus, the nominal
level of measurement was achieved. Examinations of the second and third hypotheses were conducted via Pearson's chi-square test of homogeneity, the most appropriate statistical test to utilize in this situation [Siegell, 1956; Huck, Cormier, and Bounds, 1974; Andrews, et al, 1981]. To test each of these hypotheses, a comparison was made between the actual number of preparers implementing and not implementing the future expectation exception (1) when expecting future material dilution (Hypothesis 2) and (2) when expecting future immaterial dilution (Hypothesis 3).

Little acknowledgement of the future expectation exception can be found in the professional literature. However, the exception is discussed in the APB's interpretations of APB 15 [Ball, 1970] and accountants who rely on this source may indeed be applying this exception in some or all circumstances. Nevertheless, no authoritative literature existed delineating the extent of preparer adherence to the exception. In the absence of any such evidence, no preparers could be assumed to always apply or fail to apply the future expectation exception in reporting EPS. As a result, the number of preparers implementing the future expectation exception was expected to equal the number failing to implement the exception.

The test statistic for each hypothesis was calculated via the chi-square expression described in the discussion of Case 1. For each hypothesis, expected frequencies utilized in calculating chi-square were the same for each category. For Hypothesis 2 and/or 3, a significant chi-square statistic indicated that at least one approach to applying the exception was favored in reporting EPS under expected future material and/or immaterial dilution. Where so indicated, further investigation was undertaken to determine the favored approach.
Case 3. The third case examined the no anti-dilutive security provision [‡30, ‡40] approach applied by preparers. The following hypotheses were investigated (stated in alternative form):

Hypothesis 4: Preparers of EPS favor at least one interpretation of the no anti-dilutive security provision of APB 15 [‡30, ‡40] in calculating PEPS.

Hypothesis 5: Preparers of EPS favor at least one interpretation of the no anti-dilutive security provision of APB 15 [‡30, ‡40] in calculating FDEPS.

Case 3, which is presented in Appendix D, provided EPS figures which were calculated using different combinations of selected securities. To determine which approach a preparer followed in calculating PEPS, two CSEs (Securities A and B) were presented. Each CSE was individually dilutive, but the inclusion of one (Security A) made the other (Security B) anti-dilutive. Two OPDSs (Securities C and D) were also included in order to determine which approach was utilized in computing FDEPS. The two OPDSs were individually dilutive, but including one (Security C) resulted in the other (Security D) being anti-dilutive. No numerical data was presented other than the EPS figures calculated for the various combinations of securities (e.g., EPS including Security A, EPS including Security B, EPS including Securities A and B, etc.).

The subject's approach to the no anti-dilutive security provision for calculating PEPS and for calculating FDEPS was self-selected and thus was observed in the responses. Subject responses to the questions "Which of the EPS figures listed above would you have calculated as PEPS? FDEPS?" were utilized to identify which approach(es) the subject followed in calculating PEPS and FDEPS. Responses to the questions "Which would you report on the financial statements as PEPS? FDEPS?"
were used to identify which approach(es) the subject followed in reporting PEPS and FDEPS. Responses to "If your calculated EPS figure(s) differ(s) from your reported EPS figure(s), please explain" were utilized to verify subject approach(es) being followed. Subject responses were, thus, classified into categories corresponding to the different approaches to the no anti-dilutive security provision. As a result, the following variables were determined for respondents to Case 3:

4. The no anti-dilutive security approach followed in calculating PEPS.
5. The no anti-dilutive security approach followed in calculating FDEPS.
6. The no anti-dilutive security approach followed in reporting PEPS.
7. The no anti-dilutive security approach followed in reporting FDEPS.

The data consisted of frequency counts of preparers implementing each approach to the no anti-dilutive security provision and, thus, the nominal level of measurement was achieved. Hypotheses 4 and 5 each utilized Pearson's chi-square test of homogeneity; a description of which was presented in the discussion of Case 1.

To test each of these hypotheses, a comparison was made between the actual number of preparers applying each approach in calculating PEPS(FDEPS) and the number expected to apply each approach in the calculation of PEPS(FDEPS). Based on the literature survey, no approach had received unanimous support and none was expected to be followed by all preparers. As a result, an equal number of preparers were expected to apply each approach.

For Hypothesis 4 and/or 5, a significant chi-square indicated that some degree of agreement had been achieved for the PEPS and/or the FDEPS
calculation; i.e., preparers favored at least one interpretation of the no anti-dilutive security provision [\$30, \$40] over the other interpretations. In these situations, further investigation via post hoc testing was undertaken to determine the dominant approach.

Subjects may apply one approach to the no anti-dilutive security provision in calculating PEPS and FDEPS, yet apply a different approach in reporting the EPS figures. To determine if this was the case, a comparison of the calculational approach(es) followed vs. the reporting approach(es) utilized was undertaken. A chi-square statistic was used to determine if the approaches were significantly different. If any significant difference was indicated, further analysis via post hoc testing was conducted utilizing the reporting variables.

**Case 4.** The fourth case investigated the application of the warrant/option dilution determination provision [\$36, \$42]. Because of the possible application of alternative techniques, the following hypotheses were investigated (stated in alternative form):

**Hypothesis 6:** Preparers of EPS favor at least one interpretation of the warrant/option dilution determination provision of APB 15 [\$36, \$42] in the calculation of PEPS.

**Hypothesis 7:** Preparers of EPS favor at least one interpretation of the warrant/option dilution determination provision of APB 15 [\$36, \$42] in the calculation of FDEPS.

**Case 4,** which is presented in Appendix E, included the details of one CSE, a stock option. No other CSEs were presented; however, the existence of one OPDS was acknowledged. Average and ending market prices for each of four quarters were provided in addition to annual average and year-end market prices. In order to avoid overburdening the subjects with irrelevant computational details and to reduce the
time required to complete the questionnaire, quarterly average and quarterly ending market prices were the same; however, the annual average and year-end market prices differed. No other numerical data was presented except the EPS figures calculated using different market prices (e.g., EPS based on average annual market prices, EPS based on average quarterly market prices, EPS based on year-end market prices, etc.).

The technique utilized by a subject in applying the warrant/option dilution determination provision was self-determined and was thus observed in the responses. Subject responses to the questions "Which of the earnings per share figures listed above would you calculate as PEPS? FDEPS?" were used to identify which technique(s) the subject utilized in calculating PEPS and FDEPS. Responses to the questions "Which of the listed figures would you report on the financial statements as PEPS? FDEPS?" were used to identify which technique(s) the subject utilized in reporting PEPS and FDEPS. Subject responses were, therefore, classified into categories corresponding to the various techniques for warrant/option dilution determination. Consequently, determination of the following two variables was made for the Case 4 respondents:

8. The warrant/option dilution determination technique utilized in computing PEPS.
9. The warrant/option dilution determination technique utilized in computing FDEPS.
10. The warrant/option dilution determination technique utilized in reporting PEPS.
11. The warrant/option dilution determination technique utilized in reporting FDEPS.
The data consisted of frequency counts of preparers who applied each of the various techniques in determining the dilutive status of warrants/options. This resulted in the attainment of the nominal level of measurement. Hypotheses 6 and 7 were, therefore, analyzed via Pearson's chi-square test of homogeneity.

A comparison was made between the actual number of preparers who follow each technique in the calculation of PEPS(FDEPS) and the number expected to follow each technique in the PEPS(FDEPS) computation. The literature review indicated that no one technique has been officially proclaimed the consensus technique to be followed by all preparers. Consequently, equal numbers of preparers were expected to apply each technique.

A significant chi-square for Hypotheses 6 and/or 7 indicated that preparers favored at least one interpretation of the warrant/option dilution determination provision [W36, W42] over the other interpretations in calculating PEPS and/or FDEPS. Such a finding implied that a consensus might have been achieved. Further investigation (i.e., post hoc testing) was undertaken where necessary to identify the favored technique.

Subjects may follow one technique for determining the dilutive status of warrants/options in the calculation of PEPS and FDEPS, yet follow another technique in reporting the EPS figures. To determine if such a situation existed, a comparison of the calculational technique(s) applied vs. the reporting technique(s) followed was undertaken. A chi-square statistic was used to determine if the techniques were significantly different. If any such difference was indicated, further analysis via post hoc testing was conducted using the reporting variables.
**Determination of Target EPS**

In order to establish a target EPS per APB 15 based on the cues presented in each case, the following procedures were undertaken. First, to determine if magnitude sensitivity was an intervening factor in applying the EPS computational rules, the EPS figures as reported in the 1985 Fortune 500 listing were ranked from low to high and divided into thirds ["Fortune..., 1985].

A random sample of fifty firms was selected from each of the upper and lower thirds of the ranking. PEPS and FDEPS were then collected for each of the 100 selected firms. A chi-square analysis was conducted to determine if there is a relationship between magnitude of the reported EPS number and the reporting of different PEPS and FDEPS figures. Results indicated no such relationship exists (chi-square = 0.2526; .7 > p > .5) and thus magnitude was eliminated as a variable in the study.

Once magnitude was concluded to have no effect on EPS calculations, each case was structured to reflect an "average" EPS. A second random sample of fifty firms from the 1985 Fortune 500 listing was selected ["Fortune ....," 1985].

After eliminating companies with reported losses per share, an average PEPS figure and an average FDEPS figure were computed. Based on reported EPS for the remaining forty-one companies, the average PEPS was $2.90 and the average FDEPS, $2.87. A 95 percent confidence interval constructed around each of the average

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2 Companies who reported a loss per share and those whose EPS figures were unavailable were eliminated from the ranking. A total of 412 firms were ranked.

3 All firms in the 1985 Fortune 500 listing were listed in order of total sales. A random number table was then utilized to select the fifty firms included in the sample.
EPS figures provided a target range for the EPS figures included in each case.

Pretest of Instrument

A preliminary measurement instrument was prepared after the determination of the target EPS figures. In order to determine the clarity and effectiveness of this preliminary instrument, a pretest was conducted using students at Louisiana State University enrolled in the Intermediate Accounting II course and students at the University of Southwestern Louisiana enrolled in the Advanced I and Accounting Theory courses. Each student received one of the preliminary cases for completion. Based on an analysis of the pretest results, the format of the cases was restructured in order to clarify the case requirements and to facilitate analytical procedures.

Non-Response Bias

Low response rates occur frequently in mail questionnaire studies, and, as a result, the possibility of non-response bias arises. Non-response results from a variety of factors: the study issue, the questionnaire format, a lack of subject interest in the topic, the subject's demographic characteristics, to name a few [Alreck and Settle, 1985]. Existence of non-respondents may bias the results of the study and thus limit the conclusions. Accordingly, techniques to minimize this bias were undertaken and tests to ascertain its possible existence were conducted.

Utilization of the postcard in this study allowed for a more precise identification of preparers. This procedure to estimate the "true" population of preparers helped to minimize the bias resulting from the
non-response of inappropriate subjects.

Oppenheim [1966] assumed that late respondents and non-respondents are similar and, thus, that late respondents may be used as surrogates for non-respondents. He suggested testing for differences between the early and the late respondents in order to detect possible non-response bias.

In this study, the last 33 1/3 percent of the responses received for each case were considered indicative of late responses. Scores for these respondents were segregated from the early responses (the first 33 1/3 percent for each case) and a chi-square statistic used to determine if the two groups were significantly different. If any significant difference was indicated, all subsequent analysis was conducted on each early/late group separately.

Mailing Procedures

Procedures were undertaken in this study in order to increase the response rate. The measures utilized included the timing of the mail-outs as well as specific response improvement techniques. Descriptions of the measures followed are presented in the following sections.

Time Frame of Study

The sampling procedures utilized in this study required a two-phase mailout procedure. The first phase consisted of the mailout of the advance letter and postcard to 1,000 subjects. This mailing occurred in mid-May, 1986.

During the next three weeks, the receipt of postcards from the first mailing allowed for the identification of preparers and the determination of the subjects for the second phase mailing. This three week
period included a one week allowance for turnaround time.

The second phase consisted of the mailout of the questionnaire booklet and reply envelope. This mailing occurred in early June, 1986. Subjects were given approximately six weeks to respond before data analysis began. This period included a one week turnaround period as well as an allowance for possible subject vacation time.

**Response Improvement Techniques**

Mail questionnaire surveys frequently suffer from low response rates. Previous studies indicate that these rates may vary from 0 percent to 50 percent [Robin, 1965]. The non-response bias resulting from low rates can seriously impair the generalizability of conclusions [Mayer-Sommer, 1979]. Utilization of various response improvement techniques can increase the number of respondents and thus decrease the non-response bias [Robin, 1965; Linsky, 1975; Bachrach and Scoble, 1967; Houston and Nevin, 1977; Blumberg, Fuller, and Hare, 1974; Kanuk and Berenson, 1975].

In general, the correspondence with subjects was personalized [Mayer-Sommer, 1979; Dillman, 1972; Dillman and Frey, 1974]. To achieve personalization, correspondence was addressed to the specific subject [Dillman and Frey, 1974; Dillman, 1972]. Furthermore, the signatures of Suzanne Pinac Ward and Anthony P. Curatola were individually signed with a blue pen [Dillman and Frey, 1974; Dillman, 1972].

In order to focus on preparers, to increase subject involvement, and to foster a more favorable reception for the questionnaire, an advance letter was sent to the 1,000 randomly selected subjects for the first mailing [Robin, 1965; Bachrach and Scoble, 1967; Linsky,
1975; Mayer-Sommer, 1979). The letter, printed on university letterhead, explained the research, emphasized the importance of the study, and requested the assistance and cooperation of the subject. The postcard which the subject was to return accompanied the letter. These techniques were designed to assure the subject that the study was legitimate, to minimize the possibility of the questionnaire being considered "junk mail", and to increase the response rate [Walker and Burdick, 1977]. The advance letter and postcard are presented in Appendix A.

The questionnaire, cover letter, and related background questions were printed in booklet form on cream-colored paper. In situations prone to low response rates, utilization of colored questionnaires has improved the return percentage [Matteson, 1974]. Studies have shown that responses increase when first class mail is utilized [Blumberg, Fuller, and Hare, 1974]. The cover letter, printed on official university letterhead, explained the purpose of the study and solicited the cooperation of the subject. Each booklet was accompanied by a self-addressed reply envelope. Research indicates that the inclusion of the reply envelope may create dissonance and foster a feeling of guilt in subjects, thus motivating them to respond [Linsky, 1975]. Responses were anonymous with no encoding utilized to ascertain the identity of the respondent. Cases 1, 2, 3, and 4 are presented in Appendices B, C, D, and E respectively. The cover letters are presented in Appendices F and G and the background questions in Appendix H.
This chapter discussed the methodological procedures followed in this study to ascertain whether the provisions of APB 15 provide for consistent reporting of comparable EPS figures across preparers. The seven research hypotheses which were investigated focused on four provisions of APB 15: (1) the 3 percent materiality provision, (2) the future expectation exception to the 3 percent materiality provision, (3) the no anti-dilutive security provision, and (4) the warrant/optIon dilution determination provision.

Three groups of preparers, the focal population of this study, were identified: certified public accountants (CPAs), corporate accountants (CAs), and accounting academicians (AAs). The sampling procedures followed required a two-phase mailout. Utilization of an advance letter with an accompanying postcard in the first mailout allowed for the identification of preparers from the general sampling frames of accountants. Based on the results of the first mailout, the sample for the second mailout was determined.

Stratified systematic random sampling techniques with random number starts were utilized to select subjects. The preliminary sample size for the second mailing was derived from the appropriate formula for determining the sample size in a proportionately allocated stratified random sample for proportions.

Four cases were developed to investigate the research hypotheses, one case for each provision of APB 15 under investigation. The cases presented actual EPS figures computed under different assumptions/interpretations. The subject's task was to select the appropriate EPS figures to be reported on the financial statements.
Completed questionnaires were segregated into four groups corresponding to the four cases for analysis. Each of the case variables resulted from the classification of subject responses into appropriate categories. No order or rank existed among the different categories of each variable. Pearson's chi-square test of homogeneity was, therefore, utilized to analyze the resulting nominal data.

The two-phase mailing procedures helped minimize non-response bias. In addition, non-response bias was tested for via Oppenheim's technique. The utilization of response improvement techniques, such as cream-colored paper and booklet format, was designed to increase the response rate and thus decrease the non-response bias.

This chapter has expanded the discussion from Chapter I concerning the methodology of the study. Chapter V discusses the results of the methodological procedures.
CHAPTER V

DATA ANALYSIS AND EMPIRICAL RESULTS

This study examined whether the computational/reporting provisions of APB 15 are being interpreted in such a manner that the consistent reporting of EPS figures across preparers has resulted. This chapter presents the data analysis and empirical results of the study. This chapter includes (1) a discussion of the overall and group response rates, (2) a discussion of the reliability of each case, (3) a presentation of the statistical analysis of the hypotheses, and (4) an examination of the demographic characteristics and comments of subjects.

Response

The subjects of interest in this study are the accounting preparers of EPS figures. Three general groups of accountants were identified: (1) CPA/auditors (CPAs), (2) corporate accountants (CAs), and (3) accounting academicians (AAs). CPAs were randomly selected from the public practitioners (with the exception of sole proprietors) listed in the AICPA List of Members 1984. The sample of CAs represented a random selection of controllers/assistant controllers and managers/directors of financial reporting as listed in the AICPA List of Members 1984. AAs were randomly selected from those financial accounting educators listed in the Prentice-Hall Accounting Faculty Directory 1985 [Hasselback, 1985].
Since not all members of each group are preparers, procedures were undertaken to isolate the subjects of interest (see Chapter IV, page 70). The initial mailing of 1,000 advance letters with accompanying postcards was utilized to estimate the "true" population of preparers within each of the three groups. Table 3 indicates the proportional allocation of this mailing among the three accountant groups as well as the response rates for each group.

**TABLE 3**

INITIAL MAILING

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
<th>CPAs</th>
<th>CAs</th>
<th>AAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountants</td>
<td>100,000</td>
<td>77,000</td>
<td>20,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Sample</td>
<td>1,000</td>
<td>770</td>
<td>200</td>
<td>30</td>
</tr>
<tr>
<td>Nondeliverable</td>
<td>78</td>
<td>68</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Adjusted Sample</td>
<td>922</td>
<td>702</td>
<td>190</td>
<td>30</td>
</tr>
<tr>
<td>Postcard Responses</td>
<td>307</td>
<td>227</td>
<td>74</td>
<td>6</td>
</tr>
<tr>
<td>Response Rate</td>
<td>33.3%</td>
<td>32.3%</td>
<td>38.9%</td>
<td>20.0%</td>
</tr>
</tbody>
</table>

Postcards were received from 307 subjects during the three week period between the mailing of the advance letter/postcard and the mailing of the measurement instrument. As Table 3 reports, this resulted in a 33.3 percent response rate for the initial mailing. Of the 1,000 subjects in the initial mailing, 78 were no longer associated with the indicated firm/company. As a result, their letters were non-deliverable.

The number and percentage of accountants in each of the three groups who indicated that they are involved with EPS is presented in
Table 4. Based on the postcards received from each group, 42.3 percent of the respondent CPAs, 47.3 percent of the respondent CAs, and 83.3 percent of the respondent AAs identified themselves as preparers. These percentages provided an estimate of the actual proportion of accountants in each group who are involved in EPS computation and reporting.

### TABLE 4

**POSTCARD RESPONSES**

<table>
<thead>
<tr>
<th>Compute EPS?</th>
<th>Will Take Part?</th>
<th>TOTAL</th>
<th>CPAs</th>
<th>CAs</th>
<th>AAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>114</td>
<td>76</td>
<td>33</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>22</td>
<td>20</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>EPS Preparers</td>
<td></td>
<td>136</td>
<td>96</td>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>171</td>
<td>131</td>
<td>39</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>307</td>
<td>227</td>
<td>74</td>
<td>6</td>
</tr>
</tbody>
</table>

Based on these results, the number of preparers in each group was estimated by multiplying the number of accountants in each sampling frame (from Table 3) by the estimated EPS population proportion (from Table 4). The estimate of CPA preparers was 32,500 (77,000 * 42.3%); of CA preparers, 9,500 (20,000 * 47.3%); and, of AA preparers, 2,500 (3,000 * 83.3%). Accordingly, these estimated figures were used in determining the preliminary sample size.

Of the 307 postcard responses, 114 respondents expressed their willingness to participate. Questionnaires were then sent to these 114 respondents. In addition, questionnaires were sent to the 615
subjects from the initial mailing who failed to return their postcard. This represented the difference between the 922 subjects in the adjusted sample and the 307 postcard respondents. Failure to return the postcard was viewed as tacit agreement on the part of the subject to participate in the study.1

To further insure that a sufficient number of responses would be received, questionnaires were sent to a second systematic random sample of 1,040 accountants, proportionally allocated among the three identified accountant groups. As a result, a total of 1,769 questionnaires were mailed to subjects in all fifty states.

The mailing of the 1,769 questionnaires completed the second phase of the sampling procedure. Table 5 details the distribution of this mailing among the three accountant groups as well as the estimated number of preparers included in the sample. The 97 nondeliverable questionnaires were addressed to accountants who were no longer affiliated with the indicated firm/company. As shown in Table 5, the sample of preparers was estimated to be 770 (1,672 * 46.05%) with the number of CPA preparers estimated to be 515 (1,216 * 42.3%); the CA preparers, 164 (347 * 47.3%); and, the AA preparers, 91 (109 * 83.3%).

Responses were received from 359 subjects; however, 35 respondents reported no expertise in the EPS area. Thus, as Table 5 indicates, 324 responses were received from preparers which resulted in a 42.1 percent (324/770) response rate. Of these respondents, nine preparers

1The first line of the cover letter accompanying the measurement instrument to these subjects thanked them for agreeing to participate. As a result, the identification of responses from these subjects was possible. The cover letter is presented in Appendix G.
TABLE 5

QUESTIONNAIRE RESPONSES

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>CPAs</th>
<th>CAs</th>
<th>AAAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountants in Mailout</td>
<td>1,769</td>
<td>1,291</td>
<td>369</td>
<td>109</td>
</tr>
<tr>
<td>Nondeliverable</td>
<td>97</td>
<td>75</td>
<td>22</td>
<td>-</td>
</tr>
<tr>
<td>Adjusted Mailout</td>
<td>1,672</td>
<td>1,216</td>
<td>347</td>
<td>109</td>
</tr>
<tr>
<td>Estimated EPS Proportion</td>
<td>46.05%*</td>
<td>42.3%</td>
<td>47.3%</td>
<td>83.3%</td>
</tr>
<tr>
<td>(From Table 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparers of EPS (Estimated)</td>
<td>770</td>
<td>515</td>
<td>164</td>
<td>91</td>
</tr>
<tr>
<td>Responses to Mailouts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usable</td>
<td>315</td>
<td>188</td>
<td>82</td>
<td>45</td>
</tr>
<tr>
<td>Unusable</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Preparer Responses</td>
<td>324</td>
<td>193</td>
<td>85</td>
<td>46</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>35</td>
<td>30</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total Responses</td>
<td>359</td>
<td>218</td>
<td>85</td>
<td>47</td>
</tr>
<tr>
<td>Preparer Response Rate**</td>
<td>42.1%</td>
<td>37.5%</td>
<td>51.8%</td>
<td>50.6%</td>
</tr>
</tbody>
</table>

*Total Preparers of EPS/Total Adjusted Mailout

**Preparer Responses/Preparers of EPS (Estimated)

failed to follow case directions and their responses were omitted from the analysis. Based on the preparer responses from each group, the response rate for CPA preparers was 37.5 percent; for CA preparers, 51.8 percent; and for AA preparers, 50.6 percent.

The higher overall response rate is attributable to several measures utilized in the study. First and foremost, the population of accountants was pretested to ascertain what percentage belonged to the subpopulation of preparers. A review of Table 5 shows that, without the identification of this subpopulation, the response rate is only
19.2 percent \[359/(1,672 + 171 + 22)\], a significantly lower figure. Other measures incorporated were utilization of cream-colored paper, Louisiana State University letterhead, blue researcher signatures, and booklet format. Previous research has indicated that these techniques often result in higher response rates.

Furthermore, the measurement instrument was relatively simple. Each case was designed to collect specific information about a specific APB 15 provision in as uncomplicated a manner as possible. Calculations were performed for the subjects and, thus, the time involved in answering the questionnaire was minimal.

**Data Reliability**

Four provisions of APB 15 were identified and examined in this study. Each provision is examined in a separate case and, within each case, PEPS and FDEPS are examined individually. To determine the target sample size for each case, a preliminary bound on the proportion of 10 percent and a worst case scenario with \(p_h\) (i.e., the proportion of each group with the identified characteristic) being 50 percent were adopted. In addition, the estimates of the number of preparers in each of the three accountant groups were utilized. These preliminary measures required a sample size of 100 respondents per case.²

²The estimate of 100 respondents per case was determined via the expression presented in Figure 6 and was calculated as follows:

\[n_0 = (.727)(.5)(.5) + (.216)(.5)(.5) + (.057)(.5)(.5) = 100\]

and,

\[n = \frac{100}{1 + 100/44,000} = 99.77 = 100\]
The receipt of completed cases from respondents allowed for the determination of actual $p_h$ figures as well as for the calculation of the actual bound on the proportion for each case. Case 2 respondents did not necessarily follow the same interpretation of the future expectation exception for both expected material dilution and expected immaterial dilution. Accordingly a bound on the proportion was determined for expected material dilution and another bound for expected immaterial dilution. In a similar manner, respondents to Cases 3 and 4 did not necessarily follow the same interpretation of the appropriate provision for both PEPS and FDEPS. Thus, for each of these cases, a bound on the proportion was determined for PEPS and a separate one for FDEPS. There was only one interpretation per respondent for Case 1 and, therefore, only one bound on the proportion for this case. The bound on the proportion was calculated via the expression presented in Figure 6 on page 104. The actual number of respondents to a particular case was used as the value of $n$ in the expression to determine the bounds on the proportion for that case.

Because the expression reflects a binomial situation and the cases reflect a polynomial situation (i.e., more than two interpretations may exist for a given provision), a bound was computed for each possible provision interpretation. In other words, $p_h$ was the proportion of one accountant group for one case which followed a particular interpretation while $q_h$ was the proportion of the same accountant group for the same case who did not follow that interpretation (i.e., they followed some other interpretation). Once all the bounds for a case were calculated using this approach, the largest bound was selected in order to provide a conservative bound on the proportion for that case.
FIGURE 6

EXPRESSION FOR SAMPLE SIZE DETERMINATION

\[ n = \frac{n_o}{1 + \frac{n_o}{N}} \]

and,

\[ n_o = \frac{\sum_{h=1}^{L} W_h p_h q_h}{V} \]

where,

- \( n \) = the number of units in the sample
- \( N \) = \( N_1 + N_2 + \ldots + N_L \); the total number of units in all \( L \) strata
- \( W_h \) = \( \frac{N_h}{N} \); the fraction of total units in stratum \( h \)
- \( N_h \) = the total number of units in stratum \( h \)
- \( B \) = the bound on the error of estimation of the proportion such that \( P\{ | \hat{\Theta} - \Theta | \leq B \} = 1 - \alpha \)
- \( \Theta \) = the true proportion of the population with the identified characteristic
- \( \hat{\Theta} \) = the estimator of population proportion \( \Theta \)
- \( V = \frac{B^2}{N} \); the desired variance of population proportion \( \Theta \)
- \( p_h \) = the proportion of stratum \( h \) with the identified characteristic
- \( q_h = 1 - p_h \); the proportion of stratum \( h \) without the identified characteristic
The sample size (n) and the bounds resulting are presented in Table 6. The bounds on the proportion range from 8.5 percent to 13.7 percent with the higher sample sizes generally associated with the lower bounds. The lower sample size and, thus, higher bound for Case 4 may have resulted from the perceived complexity of the case itself. Case 4 examined the warrant/option dilution determination provision and thus required the presentation of many previously calculated EPS numbers. Subjects may have perceived this case to be difficult and time-consuming based on a quick visual survey of the questionnaire.

TABLE 6
DATA RELIABILITY

<table>
<thead>
<tr>
<th>Case</th>
<th>Variable</th>
<th>Sample Size (n)</th>
<th>Bound (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EPS Interpretation</td>
<td>116</td>
<td>8.5%</td>
</tr>
<tr>
<td>2</td>
<td>Material Dilution</td>
<td>78</td>
<td>10.2%</td>
</tr>
<tr>
<td></td>
<td>Immaterial Dilution</td>
<td>78</td>
<td>9.9%</td>
</tr>
<tr>
<td>3</td>
<td>PEPS Approach</td>
<td>88</td>
<td>10.3%</td>
</tr>
<tr>
<td></td>
<td>FDEPS Approach</td>
<td>88</td>
<td>10.5%</td>
</tr>
<tr>
<td>4</td>
<td>PEPS Technique</td>
<td>69</td>
<td>13.7%</td>
</tr>
<tr>
<td></td>
<td>FDEPS Technique</td>
<td>69</td>
<td>13.7%</td>
</tr>
</tbody>
</table>

Statistical Analysis of the Hypotheses

To determine whether a set of computational interpretations/rules dominates the use of all other computational interpretations/rules, a field survey methodology was utilized. Three groups of accountants (CPAs, CAs, and AAs) were identified as preparers. Each case contained
a series of actual EPS figures that had been calculated under alterna-
tive interpretations of the provision being investigated. Information
concerning the common stock equivalency status of securities was pre-
sented where necessary. Subjects were asked to select which of the cal-
culated EPS figures she/he would report as PEPS and which she/he would
report as FDEPS. The cases are presented in Appendices B, C, D, and E.

Since a subject evaluated the data pertaining to a single case
only, each subject's response was classified into the category corres-
ponding to the interpretation of the highlighted APB 15 provision. The
main statistical test used to analyze the resulting nominal data was
Pearson's chi-square test of homogeneity.

Tests of Assumptions of the Expression

Nonparametric statistical tests such as the one utilized in this
study require few assumptions concerning the underlying nature of the
population from which the sample has been selected. This is one advan-
tage of using this type of statistical analysis. Pearson's chi-square
test of homogeneity has two basic assumptions: (1) independence of
observations and (2) nominal data.

The first assumption, independence of observations, requires that
the observations be independently drawn from the population. To satisfy
this assumption, systematic stratified random sampling with random
number starts was utilized. The independence assumption also requires
that a subject appear in exactly one variable category. Each subject
was classified into one interpretational approach for each variable for
her/his particular case. Therefore, each variable had exactly one
observation per respondent. Thus, the first assumption is satisfied.
The second assumption, nominal data, requires only that classifications be utilized with no rank or order between categories. Each subject's response was categorized by interpretational approach with no approach being considered better or worse than any other approach. The resulting data was nominal and, as a result, the second assumption was met.

Case Analysis

The results of the statistical analysis are presented and discussed in the following sections. As each case is independent of the other three cases, the results for a case will be discussed in their entirety before proceeding to the discussion of the next case.

Case 1. The first case examined the interpretation of the 3 percent materiality provision applied by respondents in reporting EPS. Table 7 presents the results of the chi-square test of the null hypothesis that preparers do not favor at least one interpretation of the 3 percent materiality provision. The resultant p-value of .0820 (greater than .05) indicates that the null hypothesis could not be rejected. This finding implied that preparers do not statistically follow at least one interpretation of the provision more than others. However, if a significance level of .1 was to be utilized, then the p-value of .0820 would be significant. This finding would suggest that at least one interpretation of the provision was preferred over the others. As a result, one may question whether .0820 is slightly significant.

Since the real interest is whether a consistent application of one interpretation of the provision is occurring, the percentage of preparers using each alternative interpretation may provide insight. The percentage of respondents following each of three previously
discussed interpretations of the 3 percent materiality provision are provided in Table 8. Notably, the second interpretation, in which only FDEPS is compared to SEPS, had the highest percentage of adherents. However, no one interpretation appeared to dominate (i.e., 50 percent or more) over all of the other interpretations.

**TABLE 8**

**INTERPRETATION COMPARISON - 3 PERCENT MATERIALITY PROVISION**

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1: PEPS/FDEPS Compared</td>
<td>23.38%</td>
</tr>
<tr>
<td>Individually to SEPS</td>
<td></td>
</tr>
<tr>
<td>I2: FDEPS Only Compared</td>
<td>44.15%</td>
</tr>
<tr>
<td>to SEPS</td>
<td></td>
</tr>
<tr>
<td>I3: FDEPS Only Compared</td>
<td>32.47%</td>
</tr>
<tr>
<td>to PEPS</td>
<td></td>
</tr>
</tbody>
</table>

**Case 2.** The second case examined application of the future expectation exception to the 3 percent materiality provision. Hypothesis 2 tested preparer application of the future expectation exception under the condition of expected material (> 3%) future dilution and Hypothesis 3, the exception's application under expected immaterial
(< 3%) future dilution. Table 9 presents the results of the chi-square tests of these two hypotheses. The p-values for both null hypotheses were highly statistically significant; thus, both hypotheses were rejected.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>$X^2$</th>
<th>df</th>
<th>$p &gt; X^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2: Material Dilution</td>
<td>14.821</td>
<td>1</td>
<td>.0001</td>
</tr>
<tr>
<td>H3: Immaterial Dilution</td>
<td>19.753</td>
<td>1</td>
<td>.0001</td>
</tr>
</tbody>
</table>

Further analysis of subject responses indicated that, when material future dilution was expected (Hypothesis 2), 71.8 percent of the respondents applied the future expectation exception and 28.2 percent did not. Respondents noted that the presentation of both PEPS and FDEPS in this situation enhanced the long-run comparability of the EPS figure. However, when immaterial future dilution was expected, only 24.7 percent of the respondents implemented the future expectation exception. Many of the 75.3 percent of the respondents not applying the exception in this circumstance indicated that expectations of future dilution were not relevant if dilution existed in the current period.

Case 3. The third case examined the approach utilized by preparers in applying the no anti-dilutive security provision. The null hypothesis that preparers did not favor at least one interpretation of the no anti-dilution security provision in calculating PEPS was tested in Hypothesis 4. For Hypothesis 5, the null hypothesis was that they did not favor at least one interpretation of the provision
in calculating FDEPS. Table 10 presents the results of the chi-square analysis of the two Case 3 hypotheses.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p &gt; \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4: PEPS Approach</td>
<td>6.696</td>
<td>1</td>
<td>.0100</td>
</tr>
<tr>
<td>H5: FDEPS Approach</td>
<td>1.946</td>
<td>1</td>
<td>.1630</td>
</tr>
</tbody>
</table>

The p-value for Hypothesis 4 ($p = .0100$) was statistically significant signifying that the respondents favored one of the two major interpretations of the no anti-dilutive security provision. Further analysis of subject responses revealed that only 64.56 percent of the respondents followed the aggregate approach in computing PEPS. Therefore, 35.44 percent did not utilize this approach. While a majority respondents favored the aggregate in the calculation of PEPS, the existence of a consensus approach is not clearly established.

The p-value of .1630 for Hypothesis 5 was not significant. Thus, the respondents did not appear to favor either of the two major interpretations of the no anti-dilutive security provision in the calculation of FDEPS. This suggests that preparers view PEPS and FDEPS from different perspectives. The majority of respondents (64.56 percent) appeared to feel that all individually dilutive CSEs should be included in the determination of PEPS. However, from a statistical viewpoint, these same respondents appeared divided as to whether all individually dilutive CSEs and other potentially dilutive securities (OPDs) should
be included in the determination of FDEPS or whether there should be an ordering to the inclusion of such securities in the calculation.

These findings raised a secondary question concerning the consistency of preparer computation of PEPS and FDEPS when required to apply the no anti-dilutive security provision. To examine the probability that preparers change from one approach in the PEPS calculation to the other approach in the FDEPS computation, ancillary testing was performed using the McNemar Test for the Significance of Changes [Siegel, 1956]. The p-value of .2187 was not significant, suggesting that respondents who changed were equally likely to change from the aggregate approach to the sequential approach as they were from the sequential to the aggregate.

The approach preparers utilized in calculating PEPS was compared to the approach they used in reporting PEPS. Results of a chi-square analysis (chi-square = 66.62; p = .0001) indicated that a relationship existed between the calculational approach and the reporting approach for PEPS. Ninety-six percent of the respondents followed the same approach for both the calculation and the reporting of PEPS. In addition, a comparison of the approach followed in computing FDEPS with the approach utilized in reporting FDEPS was undertaken. Results of a chi-square analysis (chi-square = 62.48; p = .0001) indicated that a significant relationship existed between the two approaches for FDEPS. Ninety-six percent of the respondents used the same approach for both the calculating and the reporting of FDEPS. Based on these results, no further analysis was conducted on the reporting variables.

Case 4. The fourth case examined the technique utilized by preparers in determining the dilutive status of warrants/options. The
null hypothesis that preparers did not favor at least one interpretation of the warrant/option dilution determination provision in calculating PEPS was tested in Hypothesis 6. For Hypothesis 7, the null hypothesis was that they did not favor at least one interpretation of the provision in reporting FDEPS. Table 11 presents the results of the chi-square tests of the two hypotheses for Case 4.

Table 11

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p &gt; \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>H6: PEPS Technique</td>
<td>0.000</td>
<td>1</td>
<td>1.00000</td>
</tr>
<tr>
<td>H7: FDEPS Technique</td>
<td>4.909</td>
<td>1</td>
<td>.0270</td>
</tr>
</tbody>
</table>

The p-value of 100 percent for Hypothesis 6 was a result of the equality between the observed number and the expected number of respondents applying each of the techniques of the warrant/option dilution determination provision. Thus, in the calculation of PEPS, respondents appeared not to favor either the annual or the quarterly technique. For FDEPS, however, respondents expressed a statistical preference between the two techniques. The p-value for Hypothesis 7 was .0270 which was statistically significant. Further analysis of subject responses indicated that only 63.6 percent of the respondents utilized the year-end market price in the computation of FDEPS. Therefore, 36.4 percent did not use this technique. Thus, a majority of preparers favored the annual technique in the calculation of FDEPS, but the identification of this technique as the consensus one is questionable.
The above findings raised a secondary question concerning the consistency of preparer determination of the dilutive status of warrants/options in the computation of PEPS and FDEPS. To examine the probability that preparers change from one technique in calculating PEPS to another in computing FDEPS, ancillary testing was conducted via the McNemar Test for the Significance of Changes [Siegel, 1956]. The p-value of .2668 was not significant. Therefore, the results of the ancillary testing indicated that preparers who changed technique were equally likely to change from the quarterly technique to the annual technique as they were to change in the other direction.

The technique preparers applied in computing PEPS was compared to the technique they utilized in reporting PEPS. Results of a chi-square analysis (chi-square = 50.14; p = .0001) revealed that a significant relationship existed between the computational technique and the reporting technique. Ninety-eight percent of the respondents used the same technique in both the calculation and the reporting of PEPS. Furthermore, a comparison of the technique followed in computing FDEPS vs. the technique used in reporting FDEPS was undertaken. Results of a chi-square analysis (chi-square = 63.69; p = .0001) indicated that a significant relationship existed between the FDEPS calculational technique and the FDEPS reporting technique. Ninety-eight percent of the respondents utilized the same technique for both the calculation and reporting of FDEPS. As a result of these findings, no further analysis was conducted on the reporting variables.

Case comparisons. Each case examined only one of the four highlighted provisions of APB 15. There was no interaction between cases and, thus, none between provisions. Each subject received only one
case for completion and, thus, addressed only the issues associated with that one particular provision. As a result, each provision was examined by its own independent random sample of subjects. Accordingly, no analysis was conducted across cases as no viable comparisons could be made.

Demographics

Responses were received from subjects in all three of the identified accountant groups. The majority of the responses (56.2 percent) were from accountants engaged in public practice with 29.2 percent from accountants in private industry and 14.6 percent from accounting academicians. Most respondents (96.2 percent) held CPA certificates and 3.2 percent held CMA certificates. Table 12 delineates the education and EPS experience of the subjects included in the study. In general, the respondents were experienced in the EPS area with 79.0 percent having been associated with the preparation, evaluation, or teaching of EPS for three or more years. Overall, the respondents of the study represented a highly educated group. All respondents held college degrees; 22.3 percent held at least one masters degree; and, 14.3 percent held doctorates.

Table 13 presents demographic data for the CPA/auditor (CPA) respondents concerning firm size and the respondent's position within the firm. The majority of CPA respondents were from international and national CPA firms whose practices generally include more clients requiring EPS presentations than do the practices of local firms. All firm positions were represented with 54.3 percent of the responses coming from managers. Nearly 83.0 percent of the CPA respondents indicated that EPS is computed by hand in their firm or office. Computer
### TABLE 12
EDUCATION AND EPS EXPERIENCE OF RESPONDENTS

<table>
<thead>
<tr>
<th>Highest Degree Held:</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelors</td>
<td>62.4%</td>
<td>62.4%</td>
</tr>
<tr>
<td>Masters</td>
<td>22.3%</td>
<td>84.7%</td>
</tr>
<tr>
<td>Doctorate</td>
<td>14.3%</td>
<td>99.0%</td>
</tr>
<tr>
<td>Other</td>
<td>1.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EPS Experience:</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 or more years</td>
<td>17.3%</td>
<td>17.3%</td>
</tr>
<tr>
<td>9 - 11 years</td>
<td>12.3%</td>
<td>29.6%</td>
</tr>
<tr>
<td>6 - 8 years</td>
<td>22.9%</td>
<td>52.5%</td>
</tr>
<tr>
<td>3 - 5 years</td>
<td>26.5%</td>
<td>79.0%</td>
</tr>
<tr>
<td>1 - 2 years</td>
<td>8.1%</td>
<td>87.1%</td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>12.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### TABLE 13
CHARACTERISTICS OF CPAs

<table>
<thead>
<tr>
<th>Firm Type:</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>58.9%</td>
<td>58.9%</td>
</tr>
<tr>
<td>National</td>
<td>9.7%</td>
<td>68.6%</td>
</tr>
<tr>
<td>Regional</td>
<td>6.3%</td>
<td>74.9%</td>
</tr>
<tr>
<td>Local</td>
<td>25.1%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position in Firm:</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner</td>
<td>25.7%</td>
<td>25.7%</td>
</tr>
<tr>
<td>Manager</td>
<td>54.3%</td>
<td>80.0%</td>
</tr>
<tr>
<td>Senior</td>
<td>12.0%</td>
<td>92.0%</td>
</tr>
<tr>
<td>Staff</td>
<td>5.1%</td>
<td>97.1%</td>
</tr>
<tr>
<td>Other</td>
<td>2.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Firm EPS Computational Approach:*</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>By hand</td>
<td>82.9%</td>
<td></td>
</tr>
<tr>
<td>Computer used in field</td>
<td>22.9%</td>
<td></td>
</tr>
<tr>
<td>Computer used in office</td>
<td>8.8%</td>
<td></td>
</tr>
</tbody>
</table>

*These percentages do not sum to 100 percent as some firms use more than one approach depending on the engagement.
usage in EPS calculations was low (22.9 percent in the field and 8.8 percent in the office). The nature of an engagement was cited as a determining factor in the calculational approach.

Demographic characteristics of corporate accountants (CAs) are outlined in Table 14. The majority (81.5 percent) of the CA respondents were from publicly held corporations which are required to disclose EPS figures. Responsibility for the reported EPS figures generally rests with the controller or financial reporting manager. The majority of CA respondents (83.5 percent) held one of these two positions. Corporations utilized various types of potentially dilutive securities in their capital structures with the most popular being options (81.4 percent). Accordingly, the majority of CA respondents would appear to have been exposed to some degree of complex capital structure in their company and, as a result, should have been familiar with some of the intricacies of EPS calculations.

Table 15 details the EPS teaching demographics of accounting academicians (AAs). The majority of AA respondents (72.7 percent) taught the EPS calculation within the last two years. AAs appeared to clearly favor the Kieso/Weygandt series of intermediate accounting textbooks. However, other intermediate accounting text series were and still are being utilized.

To determine whether various demographic variables had an effect on the subject responses which were used as the data in testing the four hypotheses which were rejected (Hypotheses 2, 3, 4, and 7), further ancillary testing was conducted. The association between each demographic variable and each of the four subject response variables was assessed via Pearson's chi-square test of independence.
### TABLE 14

CHARACTERISTICS OF CORPORATE ACCOUNTANTS

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly held</td>
<td>81.5%</td>
<td>81.5%</td>
</tr>
<tr>
<td>Privately held</td>
<td>17.4%</td>
<td>98.9%</td>
</tr>
<tr>
<td>Going public</td>
<td>1.1%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position in Firm:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller/Assistant Controller</td>
<td>20.9%</td>
<td>20.9%</td>
</tr>
<tr>
<td>Financial Reporting Manager/ Financial Analyst</td>
<td>62.6%</td>
<td>83.5%</td>
</tr>
<tr>
<td>Other</td>
<td>3.3%</td>
<td>86.8%</td>
</tr>
</tbody>
</table>

Outstanding Firm Securities:*

<table>
<thead>
<tr>
<th>Securities</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>81.4%</td>
</tr>
<tr>
<td>Stock appreciation rights</td>
<td>52.3%</td>
</tr>
<tr>
<td>Convertible debentures</td>
<td>33.7%</td>
</tr>
<tr>
<td>Convertible preferred stock</td>
<td>30.2%</td>
</tr>
<tr>
<td>Warrants</td>
<td>16.3%</td>
</tr>
<tr>
<td>Zero coupon bonds</td>
<td>4.7%</td>
</tr>
<tr>
<td>Other contingent share plans</td>
<td>10.5%</td>
</tr>
</tbody>
</table>

*These percentages do not sum to 100 percent as some firms have more than one type of security outstanding.

### TABLE 15

CHARACTERISTICS OF ACCOUNTING ACADEMICIANS

<table>
<thead>
<tr>
<th>EPS Teaching Experience:</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the last 2 years</td>
<td>72.7%</td>
<td>72.7%</td>
</tr>
<tr>
<td>3 - 5 years ago</td>
<td>6.8%</td>
<td>79.5%</td>
</tr>
<tr>
<td>6 - 10 years ago</td>
<td>9.1%</td>
<td>88.6%</td>
</tr>
<tr>
<td>11 or more years ago</td>
<td>9.1%</td>
<td>97.7%</td>
</tr>
<tr>
<td>Never</td>
<td>2.3%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Intermediate Texts Used:*

<table>
<thead>
<tr>
<th>Texts Used</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kieso/Weygandt series</td>
<td>73.3%</td>
</tr>
<tr>
<td>Welsch, et al., series</td>
<td>28.9%</td>
</tr>
<tr>
<td>Smith/Skoussen, et al., series</td>
<td>11.1%</td>
</tr>
<tr>
<td>Meigs/Mosich, et al., series</td>
<td>8.9%</td>
</tr>
<tr>
<td>Other</td>
<td>37.8%</td>
</tr>
</tbody>
</table>

*These percentages do not sum to 100 percent as more than one text may have been used to teach EPS.
Results of this testing indicated that, for three of the four subject response variables, the null hypothesis of no difference due to the highlighted demographic factor could not be rejected. Thus, for Variable 2 (implementation of the future expectation exception under expectation of material future dilution), Variable 3 (implementation of the future expectation exception under expectation of material future dilution), and Variable 9 (the warrant/option dilution determination technique utilized in computing FDEPS) were not affected by the various demographic factors. Conclusions resulting from their respective hypotheses may, therefore, be generalized to preparers across the country.

The results of the ancillary testing on Variable 4 (the no anti-dilutive security approach followed in calculating PEPS) indicated that the majority of demographic factors had no effect on the subject responses. However, for one demographic factor (type of employment), the p-value of .0439 was slightly significant. This finding indicated that a relationship existed between the preparer's employment as a CPA, CA, or AA and her/his application of the aggregate or sequential approach in the computation of PEPS.

Further examination required the partitioning of the overall chi-square value of 6.25077 [Everitt, 1977]. Based on this analysis, CPAs and AAs did not differ statistically from each other in their choice of approach. The chi-square value of .20812 was not significant. However, CPAs and AAs combined differed significantly from CAs in their PEPS approach. The chi-square value of 6.04265 was highly significant (.02 > p > .01).

Table 16 presents the percentage of respondents in each preparer
TABLE 16

ANCILLARY RESULTS - TYPE OF EMPLOYMENT VS. PEPS APPROACH

<table>
<thead>
<tr>
<th>PEPS Approach</th>
<th>Type of Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CPA</td>
</tr>
<tr>
<td>Aggregate approach</td>
<td>57.1%</td>
</tr>
<tr>
<td>Sequential approach</td>
<td>42.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

group who followed each of the two approaches to the no anti-dilutive security provision in computing PEPS. Notably, the overwhelming majority of CAs used the aggregate approach to the provision. CPAs and AAs appeared to be approximately evenly split in their utilization of the two approaches. Thus, employment as a CA appeared to have a significant impact on the preparer's approach to the PEPS calculation when utilizing the no anti-dilutive security provision.

Tests for Non-Response Bias

Non-response bias was tested for the second mailing and utilized Oppenheim's technique [1966] of comparing the early and the late responses. As the first mailing required only the return of the postcard, utilization of this technique for the first mailing was not possible. The second mailing was the only mailing of the measurement instrument. The results of the chi-square analysis of the early vs. late responses for each case variable are summarized in Table 17. None of the p-values were significant and, thus, no difference existed between the early and the late responses. Based on these results, no separate early/late analysis was required.
TABLE 17
ANALYSIS OF EARLY VS. LATE RESPONSES

<table>
<thead>
<tr>
<th>Case</th>
<th>Number of Early/ Late Respondents</th>
<th>Variable*</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p &gt; \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27/27</td>
<td>1</td>
<td>6.332</td>
<td>4</td>
<td>.1757</td>
</tr>
<tr>
<td>2</td>
<td>26/26</td>
<td>2</td>
<td>0.034</td>
<td>1</td>
<td>.8542</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>0.293</td>
<td>1</td>
<td>.5886</td>
</tr>
<tr>
<td>3</td>
<td>29/29</td>
<td>4</td>
<td>0.184</td>
<td>1</td>
<td>.6678</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>1.634</td>
<td>1</td>
<td>.2012</td>
</tr>
<tr>
<td>4</td>
<td>23/23</td>
<td>8</td>
<td>0.450</td>
<td>1</td>
<td>.5023</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>1.676</td>
<td>1</td>
<td>.1954</td>
</tr>
</tbody>
</table>

*VARIABLE LEGEND
1: EPS Interpretation/3 Percent Materiality Provision
2: Material Dilution/Future Expectation Exception
3: Immaterial Dilution/Future Expectation Exception
4: PEPS Approach/No Anti-Dilutive Security Provision
5: FDEPS Approach/No Anti-Dilutive Security Provision
8: PEPS Technique/Warrant-Option Dilution Determination Provision
9: FDEPS Technique/Warrant-Option Dilution Determination Provision

Summary of Results

The subjects included in this study were experienced EPS accountants. The length of this EPS experience had no significant effect on the responses. However, employment as a CA appeared to have a significant impact on the preparer's approach to the PEPS calculation under the no anti-dilutive security provision.

Seven hypotheses were developed in the previous chapters. The results of the statistical analysis of each hypothesis are summarized in Table 18. An alpha level of .05 was utilized in this study; accordingly, all of the rejected hypotheses were significant at alpha < .05.
TABLE 18
RESULTS OF HYPOTHESES TESTING

<table>
<thead>
<tr>
<th>Provision</th>
<th>Hypothesis</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Percent Materiality Provision</td>
<td>H1: EPS Interpretation</td>
<td>Fail to Reject</td>
</tr>
<tr>
<td>Future Expectation Exception</td>
<td>H2: Material Dilution</td>
<td>Reject</td>
</tr>
<tr>
<td></td>
<td>H3: Immaterial Dilution</td>
<td>Reject</td>
</tr>
<tr>
<td>No Anti-Dilutive Security Provision</td>
<td>H4: PEPS Approach</td>
<td>Reject</td>
</tr>
<tr>
<td>Warrant/Option Dilution Determination</td>
<td>H6: PEPS Technique</td>
<td>Fail to Reject</td>
</tr>
<tr>
<td>Provision</td>
<td>H7: FDEPS Technique</td>
<td>Reject</td>
</tr>
</tbody>
</table>

Overall, subjects did not appear to favor any one of the interpretations of the 3 percent materiality provision in reporting EPS. Application of the future expectation exception to the 3 percent materiality provision appeared to be affected by the expectation of future dilution. Overall, when future material dilution was expected, the future expectation exception was applied; when future immaterial dilution was expected, the exception was not applied. Overall, respondents favored the aggregate approach to the no anti-dilutive security provision in computing PEPS. However, no one approach was preferred overall in calculating FDEPS. In applying the warrant/option dilution determination provision to the PEPS computation, no one overall preference was expressed. Overall, however, subjects endorsed the year-end market price in applying the provision to the FDEPS calculation.
CHAPTER VI

SUMMARY AND CONCLUSIONS

This chapter attempts to synthesize the findings of the study into a coherent collection of conclusions. First, a summary of the research project is presented. Second, the major implications resulting from the findings of the study are discussed. Thirdly, limitations of the research are noted. Lastly, some possibilities for future research are presented.

Summary

Earnings per share is considered by many to be one of the most important summary indicators presented in the financial statements. Many financial statement users rely on EPS as the most important single measure of corporate performance. Previous empirical evidence suggests that a strong link exists between EPS changes and stock price changes.

EPS condenses complex and varied financial information into a deceptively simple statistic. Issued in 1969, APB 15, as amended, contains the current guidelines for computing and reporting EPS. This complex collection of provisions represents the APB's response to increased pressure for a standardized set of EPS guidelines.

In this study, the existence of alternative interpretations of four provisions of APB 15 was examined. The four selected provisions are (1) the 3 percent materiality provision [¶15], (2) the future
expectation exception to the 3 percent materiality provision [¶17], (3) the no anti-dilutive security provision [¶30, ¶40], and (4) the warrant/opti,on dilution determination provision [¶36, ¶42]. A closer investigation of these four selected provisions revealed that alternative interpretations do exist for each provision. Accordingly, any alternative interpretation of an APB 15 provision may be used in actual EPS computations. Utilization of such alternative interpretations could have a material effect on reported EPS.

The objective of this study was to determine if the provisions of APB 15 provide for consistent reporting of comparable EPS figures across preparers of financial statements. With much confusion and controversy existing over the computation and reporting of EPS, the application of alternative interpretations of APB 15 provisions has the potential to produce different EPS figures. As a result, the degree of comparability of the reported EPS figures across companies is unclear.

No prior research exists indicating whether preparers have adopted one interpretation of any of the four selected APB 15 provisions over any of the provision's alternative interpretations. Therefore, the motivation for the research was to provide evidence as to whether a consensus application of any or all of the four provisions examined exists. Such a consensus would support the contention that the APB's goal of a uniform EPS calculational approach has been achieved. However, this consensus may exist for none, one, some, or all of the provisions of APB 15.

Table 19 recaps the results of the statistical analysis of each of the seven hypotheses under investigation. None of the three
TABLE 19
RECAP - STATISTICAL ANALYSIS OF HYPOTHESES

<table>
<thead>
<tr>
<th>Provision</th>
<th>Hypothesis</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Percent Materiality Provision</td>
<td>H1: EPS Interpretation</td>
<td>Fail to Reject</td>
</tr>
<tr>
<td>Future Expectation Exception</td>
<td>H2: Material Dilution</td>
<td>Reject</td>
</tr>
<tr>
<td></td>
<td>H3: Immaterial Dilution</td>
<td>Reject</td>
</tr>
<tr>
<td>No Anti-Dilutive Security Provision</td>
<td>H4: PEPS Approach</td>
<td>Reject</td>
</tr>
<tr>
<td></td>
<td>H5: FDEPS Approach</td>
<td>Fail to Reject</td>
</tr>
<tr>
<td>Warrant/Option Dilution Determination Provision</td>
<td>H6: PEPS Technique</td>
<td>Fail to Reject</td>
</tr>
<tr>
<td></td>
<td>H7: FDEPS Technique</td>
<td>Reject</td>
</tr>
</tbody>
</table>

interpretations of the 3 percent materiality provision were favored over any of the other interpretations in the reporting of EPS (Hypothesis 1). The application of the future expectation exception to the 3 percent materiality provision depended on the materiality of the expected dilution (Hypotheses 2 and 3). The exception was invoked when material future dilution was expected (Hypothesis 2), but not when immaterial future dilution was expected (Hypothesis 3).

One approach to the no anti-dilutive security provision was favored, but only for the calculation of PEPS (Hypothesis 4). In the PEPS computation, the aggregate approach was preferred, but only by 64.56 percent of the sample population. No one approach was favored for FDEPS computations (Hypothesis 5). The opposite situation occurred
for the warrant/option dilution determination provision. No technique was favored for the calculation of PEPS (Hypothesis 6). However, utilization of year-end market prices was preferred for FDEPS computations (Hypothesis 7), but only by 63.6 percent of the sample respondents.

**Implications**

Consensus is defined by Webster [1969] as group solidarity in sentiment and belief; i.e., unanimity. The term is generally utilized to infer unanimous (i.e., 100 percent) agreement by a group on a particular topic. This study has attempted to discern whether preparers have adopted a set of consensus interpretations for four selected provisions of APB 15; i.e., whether there is unanimous agreement among preparers on which interpretation of a provision to apply. The results of the study clearly indicate that such a consensus has not been achieved, but rather suggest that measurer bias has been introduced into the calculation and reporting of EPS.

Preparers are divided in their usage of the three interpretations of the 3 percent materiality provision. Not one of these interpretations has been utilized by even a majority (> 50%) of the respondents. Thus, a consensus interpretation of the 3 percent materiality provision does not exist. Viable comparisons of EPS may depend upon knowing which interpretation a preparer applied.

The results of the examination of the future expectation exception to the 3 percent materiality provision indicate that preparers favor presenting both PEPS and FDEPS regardless of the expectation of future dilution. Preparers apparently feel that financial statement users
should be apprised of current potential dilution under all circumstances. These results have produced the closest to a consensus interpretation for any of the four provisions examined. However, unanimous (i.e., 100%) adoption of one interpretation does not exist.

Investigation of the no anti-dilutive security provision indicates that a majority of preparers feel that all individually dilutive common stock equivalents should be included in the determination of PEPS regardless of the individual impact of each individual security on the overall PEPS calculation. Furthermore, the fact that corporate accountants most often apply the aggregate approach in computing PEPS may imply that the aggregate approach is the one favored by private industry. Despite this majority preference, no consensus approach to either the calculation of PEPS or the computation of FDEPS has been clearly indicated.

Examination of the warrant/option dilution determination provision indicates that a majority of preparers apparently feel that FDEPS should reflect the year-end market situation regardless of the stock price fluctuations during the year. However, as in the case of each of the other three provisions, no clear-cut consensus interpretation of the warrant/option dilution determination has been identified for either the PEPS or the FDEPS calculation.

The results of this study, therefore, indicate that, after almost twenty years, a set of consensus interpretations of the provisions of APB 15 has not yet been achieved. The findings imply that EPS reflects the preparer's individual interpretational approach rather than a uniform, consistent profession-wide approach. As a result, the comparability of the reported EPS figures across companies does not exist.
These findings suggest that an evaluation of the calculation and reporting of EPS should be conducted. This evaluation should be undertaken in terms of the objectives and environment of financial reporting in order to increase the usefulness of EPS and to eliminate areas of difference [APB, 1970, ¶210]. The adoption of a consensus set of APB 15 interpretations or the establishment of a new uniform set of EPS rules by an authoritative rule-making body should reduce management's ability to manipulate income. Furthermore, the selective application of APB 15 interpretations in order to achieve a desired result would be eliminated. The findings of the current study provide a starting point for such an evaluation of the calculation and reporting of EPS.

**Limitations**

The major limitations of this study result from the research procedures utilized. Mail questionnaire studies frequently have low response rates which limit the generalizability of the results. However, the utilization of a series of response improvement techniques resulted in a moderately high response rate for all three preparer groups.

The procedures used to identify preparers may produce an upwardly biased estimate of the "true" proportion of preparers since preparers may be more willing to respond than non-preparers. However, this makes the conclusions drawn by the study more conservative.

Utilization of a questionnaire format introduces the possibility of ambiguity. To reduce chances of ambiguity, the cases were pretested at several stages using upper-level accounting students.
The use of four different cases may possibly produce an ordering bias. To avoid such a situation, one of the four cases was randomly assigned to each of the subjects. Self-administered questionnaires assume that respondents possess the necessary skills to complete the questions in an intelligent manner. Open-ended questions were included in each case in order to provide respondents with the opportunity to explain and clarify their responses.

The task included in each case was simplified in comparison to an actual EPS calculation. Many factors affect the computation of EPS and often interact with each other in the procedure. However, to avoid overburdening the preparers, only those factors which had a direct bearing on a case were included in that particular case.

The generalizability of the results is limited by the type of capital structures of firms presented in the cases. Generally, the more complicated the capital structure of a company, the more complicated is its EPS computation. By focusing on only one provision per case, the capital structure, by necessity, reflected only the securities needed to investigate that one provision. Also, the inclusion of only four selected provisions restricts the generalizability of results.

**Future Research**

This study represents an initial investigation into an EPS consensus calculational approach and, thus, the results appear to have important implications for future research. Most prior studies have concentrated on the theoretical aspects of APB 15 provisions. With few exceptions, their findings indicate that APB 15 should be amended or abandoned. This study concentrates instead on the practical aspects of
applying APB 15 and the usefulness of the resulting EPS figures. Based on the research findings, it appears that the practical application of the provisions of APB 15 can no longer be ignored in accounting research, but rather should be incorporated into such projects.

One possible area for future research is to expand the approach utilized in this study to include other APB 15 calculational/reporting provisions. Such research may identify multiple interpretations of other provisions. Investigation of actual utilization of such alternatives in EPS computations may provide additional insight into the usefulness of the EPS figure. In addition, future research could expand the approach utilized in this study to include users of EPS such as stockholders and bank loan officers.

The inclusion of additional details in future cases would increase the realism of the task and would provide further knowledge concerning preparers' EPS calculational techniques. Cases involving one provision could include such complexities as the actual conversion of one or more common stock equivalents during the period.

Two or more APB 15 provisions per case could be included in future research studies. The incorporation of two or more provisions would allow for an analysis of the interactive effects of the included provisions as well as of the individual effects.

Future research could also investigate the preparer's actual ability to compute EPS based on provided factual data. This study required only that preparers select which of several pre-calculated figures she/he would report. By requiring that each preparer actually compute the EPS figures, a better indication of the actual EPS calculational knowledge of preparers may be achieved. The actual computation
of EPS may also allow for the determination of a probability distri-
bution of EPS figures for a specified situation. This may provide in-
sight into the quality of EPS disclosures.

Another area for possible future research is an investigation
of the effects of alternative interpretations on the prediction of
stock prices. EPS figures could be calculated for both hypothetical
and real companies using alternative interpretations of APB 15 pro-
visions. Stock price predictions based on these EPS figures could
then be analyzed to determine the significance of the utilization of
such alternatives.


Bradley, D., R. Bradley, S. McGrath, and S. Cutcomb, "Type I Error Rate of the Chi-Square Test of Independence in \( R \times C \) Tables That Have Small Expected Frequencies." Psychological Bulletin (1979): 1290-1297.


Spacek, L. "Umpiring the Earnings Per Share Results." Management Accounting (March, 1969): 9-14, 27.


APPENDIX A

ADVANCE LETTER AND POSTCARD
FOR FIRST MAILING
In a few days you will receive a letter and a questionnaire as part of a study we are conducting. You will be asked to determine the Earnings Per Share presentation for one company for one year. All computations have been performed and are shown on the questionnaire; therefore, your task will be to simply select the EPS figure. As a result, answering the questionnaire should take approximately 5 minutes.

This questionnaire is being sent to a randomly selected sample of public accountants, corporate accountants, and accounting academicians. Since every response is important to the study's success, you can help greatly by completing and returning the questionnaire.

If you wish to receive a copy of the results of the study, please sign and return the enclosed postcard. If you do not wish to participate, please sign and return the enclosed postcard indicating your reason(s) for nonparticipation. You will not be contacted further if you decide not to participate. But it is important to our results that you do complete the postcard.

Thank you.

Sincerely,

Anthony P. Curatola, Ph.D.                         Suzanne Pinac Ward, CPA
Associate Professor of Accounting                  Project Coordinator
PLEASE CHECK THE APPROPRIATE BLANK AND FILL IN YOUR NAME AND ADDRESS:

[ ] I calculate Earnings Per Share in my job and wish to receive a copy of the results of the study.

[ ] I calculate Earnings Per Share in my job, but do not wish to participate in the study.

[ ] I do not calculate Earnings Per Share in my job and do not wish to participate in the study.

[ ] Other (Please explain) _____________________________________________

NAME: ________________________________________________________________

ADDRESS: ____________________________________________________________

THANK YOU
APPENDIX B

CASE 1

3 PERCENT MATERIALITY PROVISION
INSTRUCTIONS: Assume that you are the accountant for the company in question. Please respond to each question in the blank provided.

Company PKDJ has the following convertible securities outstanding:

Security A: Common Stock Equivalent
Security B: Not a Common Stock Equivalent

The following earnings per share figures have been calculated:

<table>
<thead>
<tr>
<th>Earnings per Share</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings per common share</td>
<td>$3.00</td>
</tr>
<tr>
<td>EPS including Security A</td>
<td>2.95</td>
</tr>
<tr>
<td>EPS including Securities A and B</td>
<td>2.88</td>
</tr>
</tbody>
</table>

1. What earnings per share would you report on the financial statements as: (If no figure is to be reported, please put N/A in the blank.)

   Simple Earnings Per Share ______________________________________

   Primary Earnings Per Share ______________________________________

   Fully Diluted Earnings Per Share ______________________________________

2. Why did you report the figures that you selected?
APPENDIX C

CASE 2

FUTURE EXPECTATION EXCEPTION

TO THE 3 PERCENT MATERIALITY PROVISION
INSTRUCTIONS: Assume that you are the accountant for the company in question. Please respond to each question in the blank provided.

Company RGWZ has the following convertible securities outstanding:

Security A: Common Stock Equivalent
Security B: Not a Common Stock Equivalent

The following earnings per share figures have been calculated:

Earnings per common share . . . . . $3.00
EPS including Security A . . . . . 2.95
EPS including Securities A and B . . . . 2.88

A. If material dilution is expected next year, what earnings per share would you report on the financial statements as: (If no figure is to be reported, please put N/A in the blank.)

Simple Earnings Per Share ______________________________
Primary Earnings Per Share ______________________________
Fully Diluted Earnings Per Share __________________________

Why did you report the figures you selected?

B. If no material dilution is expected next year, what earnings per share would you report on the financial statements as: (If no figure is to be reported, please put N/A in the blank.)

Simple Earnings Per Share ______________________________
Primary Earnings Per Share ______________________________
Fully Diluted Earnings Per Share __________________________

Why did you report the figures you selected?
APPENDIX D

CASE 3

NO ANTI-DILUTIVE SECURITY PROVISION
INSTRUCTIONS: Assume that you are the accountant for the company in question. Please respond to each question in the blank provided.

Company DWJP has the following convertible securities outstanding; each of which is individually dilutive:

- Security A: Common Stock Equivalent
- Security B: Common Stock Equivalent
- Security C: Not a Common Stock Equivalent
- Security D: Not a Common Stock Equivalent

The following earnings per share figures have been calculated:

- Simple earnings per common share: $3.00
- EPS including Security A: 1.89
- EPS including Security B: 2.98
- EPS including Securities A and B: 1.98
- EPS including Securities A and C: 1.34
- EPS including Securities A and D: 2.07
- EPS including Securities A, B, and C: 1.44
- EPS including Securities A, B, and D: 2.13
- EPS including Securities A, B, C, and D: 1.61

1. Which of the EPS figures listed above would you have calculated as:

   Primary Earnings Per Share _________________________________
   Fully Diluted Earnings Per Share _________________________________

2. Which would you report on the financial statements as:

   Primary Earnings Per Share _________________________________
   Fully Diluted Earnings Per Share _________________________________

3. If your calculated EPS figure(s) in #1 above differ(s) from your reported EPS figure(s) in #2 above, please explain.
INSTRUCTIONS: Assume that you are the accountant for the company in question. Please respond to each question in the blank provided.

Company CJMG has 50,000 shares of common stock outstanding all year.

The company has a stock option plan outstanding all year. Option price is $20 per share with 10,000 common shares issuable upon conversion. The options met the 3 month test in a prior year.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Market price per common share:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average market price</td>
</tr>
<tr>
<td></td>
<td>$25</td>
</tr>
<tr>
<td>Average market price</td>
<td>25</td>
</tr>
</tbody>
</table>

The following EPS figures have been calculated:

- Earnings per common share: $3.00
- EPS based on average annual market prices: 2.83
- EPS based on average quarterly market prices: 2.90
- EPS including only first quarter average market price effects: 2.97
- EPS including only fourth quarter average market price effects: 2.92
- EPS including only first and fourth quarters average market price effects: 2.80

1. Which of the Earnings Per Share figures listed above would you calculate as Primary Earnings Per Share: ________________

2. Which of the listed figures would you report on the financial statements as Primary Earnings Per Share: ____________________________

In addition to the above figures, the following EPS figures have been calculated. (These include effects of a non-common stock equivalent.)

- EPS based on year-end market prices: $2.28
- EPS based on quarter-end market prices: 2.39
- EPS including only first quarter ending market price effects: 2.44
- EPS including only fourth quarter ending market price effects: 2.41
- EPS including only first and fourth quarter ending market price effects: 2.33

3. Which of the Earnings Per Share figures listed above would you calculate as Fully Diluted Earnings Per Share: ________________

4. Which of the listed figures would you report on the financial statements as Fully Diluted Earnings Per Share: ____________________________
APPENDIX F

COVER LETTER TO ADDITIONAL PREPARERS
IN SECOND MAILING
Dear Fellow Accountant:

Will you do us a favor?

We are conducting a survey among certified public accountants, corporate accountants, and accounting academicians. The purpose of this survey is to determine the current status of the computation and presentation of EPS.

Your responses will benefit the accounting profession because standards can be formulated, improved, or modified only if those directly affected take a position of action and involvement. All answers and comments are confidential. Your answers will be used only in combination with those of other respondents to the study. The questionnaire takes, on the average, less than 15 minutes to complete.

Please return the completed questionnaire in the postage paid reply envelope at your earliest convenience. Thank you for your help and, most importantly, your time.

Respectfully,

Anthony P. Curatola, Ph.D.          Suzanne Pinac Ward, CPA
Associate Professor of Accounting    Project Coordinator
APPENDIX G

COVER LETTER TO
IDENTIFIED/IMPLIED PREPARERS
IN THE SECOND MAILING
June 9, 1986

Dear Fellow Accountant:

Thank you for agreeing to participate in our study.

We are conducting a survey among certified public accountants, corporate accountants, and accounting academicians. The purpose of this survey is to determine the current status of the computation and presentation of EPS.

Your responses will benefit the accounting profession because standards can be formulated, improved, or modified only if those directly affected take a position of action and involvement. All answers and comments are confidential. Your answers will be used only in combination with those of other respondents to the study. The questionnaire takes, on the average, less than 15 minutes to complete.

Please return the completed questionnaire in the postage paid reply envelope at your earliest convenience. Thank you for your help and, most importantly, your time.

Respectfully,

Anthony P. Curatola, Ph.D.  Suzanne Pinac Ward, CPA
Associate Professor of Accounting  Project Coordinator
APPENDIX H

DEMOGRAPHIC SECTION OF QUESTIONNAIRE
Participant Demographic Information

1. Is your primary employment with (Check one):
   _____ a CPA firm (Go to Question 2)
   _____ a private sector company (Go to Question 3)
   _____ an educational institution (Go to Question 4)
   _____ other (Please specify): (Go to Question 5)

2. If primary employment is with a CPA firm:
   a. Is your employer or company a (Check one):
      _____ International firm
      _____ Regional firm
      _____ National firm
      _____ Local firm
   b. Are you a (Check one):
      _____ Sole Proprietor
      _____ Partner
      _____ Manager
      _____ Senior
      _____ Staff
      _____ Other (please specify)
   c. In an engagement, does your firm compute EPS (Check one):
      _____ By hand
      _____ Via a portable computer program in the field
      _____ Via a computer program at the office

   GO TO QUESTION 5

3. If primary employment is in private sector accounting:
   a. Is your company (Check one):
      _____ publicly held
      _____ going public
      _____ closely held
      _____ going private
   b. Does your company have any of the following securities outstanding? (Check as many as apply)
      _____ stock appreciation rights
      _____ options
      _____ convertible preferred stock
      _____ warrants
      _____ convertible debentures
      _____ zero coupon bonds
      _____ other contingent share plans
c. What is your current position in your company? (Check one)

- controller
- financial analyst
- manager of financial reporting
- other (please specify)

GO TO QUESTION 5

4. If primary employment is in education:
   a. Have you taught EPS in Intermediate Accounting?

- In the last two years
- Three to five years ago
- Five to ten years ago
- Earlier in my career

b. What Intermediate texts have you used to teach EPS?

GO TO QUESTION 5

5. For how many years have you been associated with the preparation, evaluation, or teaching of Earnings Per Share? (Check one)

- Less than 1 year
- 1 - 2 years
- 3 - 5 years
- 6 - 8 years
- 9 - 11 years
- 12 + years

6. What professional certificates do you hold? (Check as many as apply)

- CPA
- CMA
- CFA
- Other (Please specify)

7. What is your highest level of education? (Check one)

- Bachelor's Degree
- Master's Degree
- Doctoral Degree
- Other (Please specify)

8. What was your approximate graduation date for each of your degrees?

   Bachelor's Degree
   Master's Degree
   Doctoral Degree

THANK YOU
Suzanne Resi Pinac-Ward, the daughter of Mr. and Mrs. Andre L. Pinac, Jr., was born September 29, 1952, in Augusta, Georgia. After several relocations, she graduated from Crowley High School in Crowley, Louisiana.

She graduated summa cum laude from Louisiana Tech University in 1974 with a Bachelor of Science degree in Accounting. While in college, she was a member of Phi Kappa Phi, Mortar Board, Beta Gamma Sigma, and Beta Alpha Psi.

In 1976, she received a Master of Science degree in Accounting from Louisiana State University. During her tenure at LSU, she worked as a graduate teaching assistant/instructor.

She passed the CPA exam in 1975 and received her CPA certificate in 1979. She began teaching accounting at the University of Southwestern Louisiana in Lafayette, Louisiana, in 1979.

To continue her education, she entered the Ph.D. program in Accounting at LSU. She completed the requirements for the degree on November 20, 1986. Her teaching and research areas are financial accounting/theory, international accounting, and behavioral accounting. She has presented several papers at regional professional meetings and has published several articles in accounting and business journals.
Candidate: Suzanne Resi Pinac-Ward

Major Field: Accounting

Title of Dissertation: An Empirical Investigation of the Comparability of Reported Earnings Per Share Under Accounting Principles Board Opinion No. 15

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

November 20, 1986