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I am submitting herewith a dissertation written by Donna Lee Street entitled "Segment Cash Flow Statement: An Empirical Examination of Its Impact on the Lending Decision." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Business Administration.

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SEGMENT CASH FLOW STATEMENT:
AN EMPIRICAL EXAMINATION OF ITS IMPACT
ON THE LENDING DECISION

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Presented for the
Doctor of Philosophy
Degree
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ABSTRACT

The purpose of the study is to determine the impact of a segment cash flow statement on the lending decision. Commercial bank loan officers (167) at 90 of the nation's 300 largest commercial banks were mailed case studies and an experimental questionnaire. Completed questionnaires were returned by 117 loan officers representing 78 banks.

The loan officers were randomly assigned to three experimental groups before the questionnaires were mailed. The control group received only the segment cash flow disclosures required by generally accepted accounting principles. Members of the test groups received a complete segment cash flow statement. The soft drinks group's segment cash flow statement indicated that a stable industry was the sole source of cash while the farm group's revealed that an industry in serious trouble (farm machinery and equipment) was the source of cash. The type of segment cash flow data served as the independent variable.

In the questionnaire, the loan officers were asked to make three independent loan decisions. These were a short-term, an intermediate-term, and a long-term loan decision. The loan officers were asked how much of the requested amount they would loan and the increment above the appropriate prime rate they would charge for each loan.

MANOVA was used to determine if the type of segment cash flow data had an impact on the following dependent variables: a dummy variable indicating whether a loan was granted, the amount loaned, and the interest rate charged. Tests for variance effects were also conducted.

Results indicate that the "good news" that a stable industry was the cash source resulted in more favorable loan decisions (more loans were granted) for long-term loans. The "bad news" that an industry in trouble was the cash source resulted in less favorable loans (fewer loans were granted and smaller amounts were loaned when a loan was granted) for the short-term loans. Members of the soft drinks group exhibited more consensus in their decisions than the control group for the short- and long-term decisions. This research suggests that a segment cash flow statement contains relevant information for the lending decision.

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CHAPTER 1

INTRODUCTION

Recently, concern has arisen over the issue of disclosing segment funds data. The Financial Accounting Standards Board (FASB) [1980] released Funds Flows, Liquidity, and Financial Flexibility which discusses the issue of providing funds flow information for segments of diversified companies.

Information about the funds flow associated with different segments of an enterprise may be important for investors and creditors. At various times, an enterprise may be generating net funds inflows in one segment of its operations and using those funds in another. It may be expanding or acquiring new lines of business and contracting or disposing of others. Information to distinguish the segments of the business that generate funds flows from those that use funds may be useful in evaluating the overall performance of an enterprise and in assessing its prospects for future cash flows. That information currently is not required to be disclosed [para. 123].

Given the recent emphasis on cash flows---for example, Statement of Financial Accounting Concepts (SFAC) No. 1 [FASB, 1978]---and evidence that the disclosure of segment data influences the user's decision process [Baldwin, 1979; Kochanek, 1974; and Dhaliwal, 1978], empirical research is needed to determine the impact of segment cash flow data on the decisions of financial-statement users. To address this

issue, a study was conducted to examine the impact of segment cash flow disclosure on the lending decision.

This chapter introduces the study. First, the authoritative literature governing reporting for the segments of diversified companies and the disclosure of a statement of changes in financial position is reviewed. Then Accounting Research Monograph Number 3 and the FASB Exposure Draft "The Cash Flow Statement" are reviewed. This is followed by a discussion of the rationale for the study and a description of the research methodology. Next, the contribution and limitations of the study are discussed. Finally, the content of the remaining chapters is briefly described.

Segment Reporting Under SFAS No. 14

Reporting for the segments of diversified companies is currently governed by Statement of Financial Accounting Standards (SFAS) No. 14, "Financial Reporting for Segments of a Business Enterprise" [FASB, 1976], and minor amendments to the statement. Under SFAS No. 14, public enterprises are required to include in their financial statements information about their operations in different industries, foreign operations and export sales, and major customers. Sections of SFAS No. 14 dealing with industry segment data will now be reviewed.

The information required by SFAS No. 14 must be disclosed for each segment that is significant to the enterprise as a whole. A segment is significant if it meets at least one of the following three tests:

1. Revenue test--The segment's revenue is at least ten percent of all industry segments.
2. Operating profit test--The absolute amount of the segment's operating profit (loss) is at least ten percent of the greater in absolute amount of:
 - (i) The combined profits of all segments that did not incur an operating loss.
 - (ii) The combined operating loss of all segments that incurred an operating loss.
3. Asset test--The segment's identifiable assets are at least ten percent of the combined identifiable assets of all industry segments [para. 15].

The results of the preceding tests are to be evaluated based on several criteria set forth in SFAS No. 14. First, judgement as to the reasonableness of the segments reported is to be incorporated to enhance interperiod comparability. Second, a substantial part of the enterprise's total operations must be attributable to the reported segments. At least 75 percent of the enterprise's sales to unaffiliated customers must be from the reported segments. Finally, if the enterprise operates in one predominant industry, the enterprise need only identify that industry. After the segments have been determined, the required segment disclosures can be compiled.

According to the FASB, the following information must be presented for each reportable segment:

1. Revenue--Sales to unaffiliated customers and sales or transfers to other segments.
2. Operating profit or loss--Revenue less all operating expenses. Operating expenses not directly traceable to a segment shall be allocated to those segments for whose benefit the expense was incurred. Expenses not to be allocated (such as general corporate expense) are enumerated in SFAS No. 14.
3. Identifiable assets--Assets that are used exclusively by the segment plus an allocated portion of assets used jointly by two or more segments.
4. Other disclosures--
 - (i) Aggregate depreciation, depletion, and amortization expense.
 - (ii) Capital expenditures [paras. 22-27].

As can be seen, these requirements include mainly income statement and balance sheet data. Only requirement four covers the limited disclosure of funds data.

The Funds Statement

Accounting Principles Board (APB) [1971] Opinion No. 19, "Reporting Changes in Financial Position," requires that a statement of changes in financial position be included in a company's financial statements. According to the APB, the objectives of a funds statement are:

- (1) to summarize the financing and investing activities of the entity, including the extent to which the enterprise has generated funds from operations during the period, and (2) to complete the disclosure of changes in financial position during the period [para. 4].

The definition of funds varies in practice. Currently the statement of changes in financial position is prepared primarily using the cash or working capital definition of funds. A trend towards the cash basis has developed in recent years [Beresford and Neary, 1984].

In the statement of changes in financial position, a company should disclose the following items in addition to cash or working capital provided by operations:

- a. Outlays for purchase of long-term assets (identifying separately such items as investments, property, and intangibles).
- b. Proceeds from sale (or working capital or cash provided by sale) of long-term assets (identifying separately such items as investments, property, and intangibles) not in the normal course of business, less related expenses involving the current use of working capital or cash.
- c. Conversion of long-term debt or preferred stock to common stock.
- d. Issuance, assumption, redemption, and repayment of long-term debt.
- e. Issuance, redemption, or purchase of capital stock for cash or for assets other than cash.
- f. Dividends in cash or in kind or other distributions to shareholders [APB, 1971, para. 14].

Accounting Research Monograph No. 3

Heath [1978] argues that the objectives of a funds statement as stated in APB Opinion No. 19 are unclear, misleading, and unattainable. According to Heath, the pronouncement requires too many types of information to be disclosed in the same financial statement. The statement is

designed to disclose (1) changes in debt paying ability, (2) changes in capital structure, and (3) changes in long-term assets. Heath also states that APB Opinion No. 19 defines funds so broadly that it is a meaningless term. To solve this problem, Heath proposes that three new statements replace the statement of changes in financial position. All the information that the APB intended the funds statement to provide is potentially useful yet cannot be adequately disclosed in one statement.

The first statement needed to replace the current funds statement is a statement of cash receipts and payments. Heath states that the primary concern of investors and creditors is the ability of a firm to obtain cash adequate to cover payments. The information contained in a statement of cash receipts and payments would assist in predicting an enterprise's future performance thereby aiding in determining whether future cash payments will be met. When preparing the statement, cash from operations should be calculated using the direct method, and a clear distinction should be made between operating and nonoperating activities.

The second statement proposed by Heath is a statement of financing activities. This statement would disclose the effects of business activities on capital structure. Changes within a company's capital structure such as the conversion of securities into common stock as well as

changes in total capital structure would be disclosed in the statement.

Finally, Heath argues that a statement of investing activities is needed. Changes in a company's holdings of long-term assets would be disclosed in this statement. All increases and decreases in long-term investments would be disclosed regardless of how they were acquired or disposed of.

The Exposure Draft: Statement of Cash Flows

Currently, the statement of changes in financial position is on the agenda of the FASB. In July 1986, the FASB issued an Exposure Draft of a proposed SFAS to be entitled "The Statement of Cash Flows."

The FASB [1986] has proposed that the statement of changes in financial position be replaced by a statement of cash flows. Reasons given in the exposure draft for the proposed change are based primarily on the increased significance of information about an entity's cash flows arising since the issuance of APB Opinion No. 19. In SFAC No. 5, the FASB stated that "A full set of financial statements for a period should show: . . . Cash flows during the period" [para. 13]. Other reasons for the change are practice oriented. According to the FASB, these include:

. . . ambiguity of terms such as funds, lack of comparability arising from diversity in the focus of the statement . . ., differences in definitions of funds from operating activities . . ., differences in formats of the statement . . ., variations in classifications of funds flow, and the reporting of net changes in assets and liabilities rather than funds flows [para. 2].

APB Opinion No. 19 would be superseded by the new cash flow statement. The proposed SFAS would require a statement of cash flows as part of a full set of financial statements. The statement of cash flows should classify cash receipts and payments by operating, investing, and financing cash flows. The proposed statement provides broad guidelines for classifying cash flows. Cash flow from operating activities may be presented directly or indirectly.

Prior Research

Little if any empirical research has been conducted to assist in determining whether diversified companies should be required to disclose segment funds statements. Prior to SFAS No. 14, several accountants supported the inclusion of a statement of changes in financial position in segment reporting requirements, yet no significant empirical research was conducted to support their views. After SFAS No. 14 failed to require disclosure of a segment funds statement, research efforts in segment reporting concentrated on the profitability and financial position

information required by the FASB and the Securities and Exchange Commission (SEC) [Ajinka, 1980 and Baldwin, 1984].

Rationale and Objective of the Study

The objectives of financial reporting are enumerated and discussed in SFAC No. 1 [FASB, 1978]. Financial reporting should provide information to aid users in assessing the amounts, timing, and uncertainty of prospective cash receipts. Prospects for cash receipts are influenced by a company's ability to meet its obligations and operating needs, to reinvest in operations, and to pay dividends. This objective emphasizes the prediction of cash flows.

Information about how an enterprise obtains and spends cash, its borrowing and repayments, its capital transactions, and other factors that may affect an enterprise's liquidity or solvency should also be provided by financial reporting. This information is partially provided by the consolidated statement of changes in financial position.

Disclosure of segment cash flow data may provide information that would improve the quality of financial reporting by addressing the above objectives. A finer (more detailed, less aggregated) information system that provides segment funds flow data in addition to the consolidated data currently available may improve the user's ability to predict future cash flows. Research has shown that a finer

information system may be associated with greater accuracy of earnings predictions [Smith, 1979 and Kinney 1971]. Research is needed to determine whether the disaggregation of the statement of changes in financial position to the segment level would improve the accuracy of financial-statement users' predictions of the amount, timing, and uncertainty of future cash flows.

Another objective of financial reporting is to provide information that is useful to investors and creditors and other users in making rational decisions [FASB, 1978]. According to SFAC No. 2 [FASB, 1980], information must be relevant to be useful. To be relevant, information must have the capacity to "make a difference" in the decisions of financial-statement users [para. 46].

For segment cash flow data to be relevant, it must confirm or change the expectations of information users. Under certain circumstances, segment cash flow data may confirm financial-statement users' expectations. As a result, the probability that results will be as previously expected will increase. This may be reflected by more consensus (less variance) in the decisions of users who have access to the segment cash flow data.

In other instances, disclosure of segment cash flow data may change expectations. As a result, the perceived probabilities of the previous possible outcomes change. A

significant change in the average response of users who have access to the segment cash flow data should accompany an increase in decision consensus (decrease in variance).

Research has shown that the availability of segment information can be associated with more consensus in the decisions of financial-statement users [Ajinka, 1980 and Dhaliwal, 1978] and can significantly influence their decisions [Kochanek, 1974 and Baldwin, 1979]. The relevance of segment cash flow data can therefore be established by examining its impact on the decisions of a group of financial-statement users. If subjects receiving segment cash flow data make significantly different decisions and/or display more consensus in their decision making than subjects not receiving this information, an argument can be made that the information is relevant.

Methodology

Under certain conditions, a segment cash flow statement may more accurately reflect a company's ability to generate cash in future periods than the limited segment funds flow data required by generally accepted accounting principles (GAAP). For example, a segment cash flow statement should reveal whether cash is currently being generated by a segment operating in a growth industry, a stable industry, a cyclical industry, or an industry in serious trouble. This

information should assist creditors and investors in predicting future cash flows.

To determine whether segment cash flow data would influence financial-statement users' decisions, a field study was undertaken to examine the impact of segment cash flow data on a lending decision. The study's purpose was to examine the possible relationship between the amount of credit granted and the interest rate charged by commercial bank loan officers and the availability of a segment cash flow statement. The effect of segment cash flow disclosure on decision consensus (variance) was also examined.

The impact on the lending decision of a segment cash flow statement as opposed to a general segment funds flow statement was examined for two reasons. First, one of the projects on the agenda of the FASB is to consider a change from the statement of changes in financial position to a cash flow statement. The second reason is the increased support for reporting the statement of changes in financial position on a cash basis instead of a working capital basis. The FASB [1978] has expressed its preference for the cash basis in SFAC No. 1. A study by the Financial Executives Institute reveals that all user groups prefer the cash basis [Seed, 1984].

In this study, three groups of commercial bank loan officers were mailed questionnaires differing only in the

type of segment cash flow data available. The loan officers were asked to make a loan recommendation for a single company operating in two industries. One segment operated in a stable industry (low risk with a history of consistent profitability) while the other operated in an industry currently in serious trouble (has incurred net losses in recent years and no recovery is expected for several years). Group one served as the control and received only the segment cash flow data required by SFAS No. 14. The other groups received complete segment cash flow statements in addition to the information received by the control group.

Group two's segment cash flow statement indicated that a stable industry, soft drinks, had been the sole source of cash for the past three years. This information should increase the loan officers' confidence in the company's ability to generate cash in future periods. If segment cash flow data are relevant, the information should change expectations resulting in more favorable loan decisions than those made by the control group. In this study, the term favorable loan decisions indicates that more loans were granted, larger amounts of money were loaned, and/or lower rates of interest were charged; they are favorable to the bank's client. Decisions not to grant a loan or to loan smaller amounts of money at higher interest rates will be referred to as unfavorable loan decisions. More decision

consensus (less variance) should also be exhibited by the soft drinks group than by the control group.

The segment cash flow data supplied to group three revealed that an industry in serious trouble, farm machinery and equipment, had been the sole source of cash for the past three years. The loan officers should feel less confident that the company can continue to generate sufficient cash in future periods; prior expectations of the loan officers should change. As a result, the farm group should make less favorable loan decisions than the control group. Loan officers in the farm group should also display more consensus (less variance) in their decision making than the control group.

Contribution of the Study

Results of the study indicate that commercial bank loan officers perceive segment cash flow disclosures to have information content beyond that provided in a consolidated statement of changes in financial position prepared on a cash basis. Conclusions concerning the conditions under which the disaggregation of the cash flow statement may have an impact on the lending decision are also made.

When combined with studies where other user groups serve as subjects, the findings of this study might assist the FASB in deciding whether segment reporting requirements

should be expanded to include segment cash flow disclosure. Studies addressing whether segment cash flow disclosure improves the quality of certain decisions based on financial reports may only be conducted if companies are required to make this information available to interested user groups.

Limitations of the Study

As in all research, the current study is limited in scope. Limitations include:

1. Because only one user group was surveyed and only two situations were examined, external validity is limited.
2. The financial statements of real firms were not available. Therefore, statements were created for the study and may not be completely realistic.
3. The utility of segment cash flow data could not be examined since the financial statements of real firms were not available.
4. The experimental task may not have been realistic.
5. Nonresponse bias may be a problem as in most mail studies.

Since only one user group, commercial bank loan officers, served as subjects for the study, the external validity of the study is limited. Loan officers are, however, a logical starting point for examining the impact of segment

cash flow data on the decisions of financial statement users. These financial statement users are concerned with which segments of a diversified company generate cash flow. Other studies should examine the usefulness of segment cash flow disclosures for other user groups.

The study's generalizability is also limited since only two situations were examined. The number of situations that could be examined was constrained by the number of subjects available. Based on a review of the relevant literature and interviews with commercial bank loan officers, the situations investigated should provide adequate results from which conclusions concerning the impact of segment cash flow disclosure on the lending decision can be drawn.

Another limitation is that real firms could not be examined. However, the financial statements used in the study were developed using average financial ratios for firms in the industries involved. The ratios were obtained from Robert Morris Associates Statement Studies [Robert Morris Associates, 1984] and Almanac of Business and Industrial Ratios [Troy, 1984]. The annual reports of firms operating in the industries included in the study were also examined to make the financial statements as realistic as possible.

Since real companies could not be used in the study, only the impact of segment cash flow data on the lending

decision could be tested. Whether the quality of the lending decision can be improved by disclosing segment cash flow data cannot be directly examined. The study can only reveal whether the additional disclosure was used and whether the disclosure affected consensus, but the study cannot reveal if the data improved the quality of the lending decision.

The decision task may have been artificial because the loan officers were asked to base their loan recommendations almost solely on financial data. In the real world, other factors would be expected to enter the decision process. In an attempt to minimize this problem, the subjects were asked to make preliminary loan recommendations based on the financial data.

As in all mail studies, the problem of nonresponse bias may exist. A test for nonresponse bias was included as part of the statistical analyses.

Organization of the Study

The remaining chapters cover the following topics. Chapter 2 reviews the relevant accounting and behavioral literature. A detailed description of the research methodology is presented in Chapter 3. Chapter 4 describes the data analysis and its results. In Chapter 5, conclusions are discussed along with suggestions for additional research. Appendixes include copies of letters sent to the

participants requesting their cooperation and copies of the research instrument and tables containing the results of additional statistical analyses not discussed in Chapter 4.

CHAPTER 2

LITERATURE REVIEW

This chapter addresses the major relevant areas of accounting and related research. First, the literature presenting arguments for or against segment funds data is reviewed. Then the research addressing the effects of segment disclosures required under the SEC's line of business (LOB) reporting guidelines and SFAS No. 14 are reviewed. Finally, selected behavioral research and events theory literature is reviewed to develop theoretical support for the study.

Segment Funds Data

Several accountants have addressed the pros and cons of disclosing segment funds statements. Rappaport and Lerner [1969] argue that a funds statement is a potentially valuable source of information for investors of diversified enterprises. Information not directly available from income statement and balance sheet data, yet available in a funds statement, can facilitate an understanding of an enterprise's economic affairs. A segment funds statement provides a basis for analyzing the relationship between earnings growth and management's deployment of funds among

segments and a framework for estimating a company's future capital requirements.

Rappaport and Lerner state that by analyzing a segment funds statement the following important questions can be answered:

- (1) Are the company's funds committed to high-growth projects or used up by low-growth projects?
- (2) Do low-growth activities that drain the company's funds exist?
- (3) How productive are the funds invested in various segments?
- (4) Do estimates of sources and uses of funds for the next few years indicate that external financing will be required?
- (5) Do estimates of earnings and capital requirements for the next few years reflect expected changes in dividend rates [p. 39]?

Rappaport and Lerner propose two types of funds statements: (1) segmenting by growth rate and (2) segmenting by basic activities. Rappaport and Lerner assert that the potential benefits to be achieved through the inclusion of segment funds statements in financial reporting requirements are of paramount importance.

Solomons [1968] discusses various items that should be disclosed in financial statements to enable stockholders to appreciate the significance of divisional earnings. Among these is "the treatment of all nonoperating gains and losses, such as gains and losses on the disposal of fixed assets, fairly attributable to particular divisions . . ." [p. 102]. This information is not required to be disclosed

under FASB Statement No. 14. If a segment funds statement was required, this information would be readily available.

Lurie [1979] acknowledges the usefulness of a segment funds statement for managerial purposes and addresses the ease with which such a statement can be prepared. Lurie states that the disaggregated information made available through SFAS No. 14 provides most of the information needed to prepare a segment-level statement of changes in financial position. Knowledge of which segments are sources and uses of working capital is very useful to management. Lurie strongly urges managers to periodically prepare and use such a statement to facilitate the decision process. Lurie sees no hardship in preparing the segment funds statement. Because the necessary information is readily available internally, the additional costs for external disclosure should be minimal.

A subcommittee of the AAA Committee on Financial Accounting Standards [1976] addressed the desirability of disclosing segment funds information. The subcommittee asserts that a complete funds statement is primarily useful for managerial purposes.

Although the AAA subcommittee does not recommend a complete segment funds statement, various components of the statement are viewed as useful. The subcommittee states that public disclosure of segment depreciation and capital

expenditures should be mandatory. In concluding, the subcommittee adds:

The cash or working capital by segment operations would also be a valuable information item if the circumstances afford a meaningful calculation [p. 225].

The FASB [1974] discussion memorandum issued on reporting for segments of a business enterprise addresses as one of its questions: What segment information related to the statement of changes in financial position should be reported? Disclosing no segment funds information, disclosing selected funds information, or disclosing a complete or condensed segment funds statement are addressed as possible answers.

In the FASB discussion memorandum, proponents of disclosing no segment funds information based their views on the difficulty involved in identifying a substantial portion of the enterprise's assets and liabilities with specific segments. To determine the desirability of presenting segment information for both the balance sheet and the statement of changes in financial position, the FASB conducted interviews of 30 companies.

Twenty-two companies indicated that segment balance sheets and segment statements of changes in financial position are not feasible due to allocation problems Eight companies stated that they could prepare segment balance sheets and segment statements of changes in financial position Such statements are presently published by two of the eight companies. The other

six companies indicated that these statements should not be presented [para. 199].

Among those supporting the disclosure of selected funds information, three items were viewed as extremely useful:

1. Capital expenditures.
2. Working capital provided from operations.
3. Issuance or repayment of long-term debt.

The FASB [1976] eventually adopted the position of disclosing selected funds flow information.

Rappaport and Lerner [FASB, 1974] are the primary proponents of presenting a complete segment funds statement. They base their view on four major points.

1. Investors should estimate the permanence of the company's reported growth rate in determining a multiple of company earnings. However, permanence of growth is dependent upon ability to maintain capital investment outlays. An indicator of this ability is provided by statements of changes in financial position.
2. Concern over corporate liquidity by investors necessitates the presentation of information as to which segments are net sources of funds and which segments are net users.
3. Investors can better estimate prospects of a company if they are provided with information regarding cash generated by investments in different activities. A segmented statement of changes in financial position could serve as the source of information regarding both cash generated and the amount of capital expenditures for a company's various activities.
4. Most importantly, the disclosure of investments by segments indicates management's commitment to future endeavors of various segments. An investor may or may not agree with management's resource allocation plan, but the

information allows the investor yet another basis for valuing the company's shares [para. 210].

Rappaport and Lerner state that segment funds information is more useful than segment balance sheet information.

Kostolansky and Porter [1985] address the problem of disappearing parent-only funds statements. Their survey of a random sample of Fortune 500 companies' 10K reports reveals that the disclosure of parent-only funds statements has all but disappeared. Kostolansky and Porter argue that consolidated funds flow statements may give an unrealistic picture of a parent company's ability to repay a loan. A consolidated funds flow statement can conceal that cash flow is being generated primarily by subsidiaries. An illustration is given using Federal Corporation. In 1984, of \$73 million in working capital provided by operations, only \$1.2 million was generated by the parent company's operations. Due to legal restrictions, cash generated by subsidiaries may not be available to the parent company. Kostolansky and Porter urge lenders to make their needs known to the SEC by encouraging the required reporting of parent-only financial statements.

Empirical Research on the Segment Reporting Issue

Most empirical research in the area of segment reporting has examined the effects of segment earnings and

profitability data. In order to provide evidence that segment data, the result of a finer (disaggregated) information system, can affect the decisions of financial statement users, this literature is reviewed.

Expected Return and Earnings Prediction Effects. Segment disclosure and its relationship with return expectations has been examined in five articles: Stallman [1969], Ortman [1975], Twombly [1979], Ajinka [1980], and Horwitz and Kolodny [1977]. These market-based studies indicate that fineness levels (degree of segment disclosure versus consolidated disclosure) had no significant effect on the market's assessment of expected returns.

In a behavioral study, Stallman [1969] asked financial analysts to assess the per-share "intrinsic" values of two firms. Each analyst received one of four experimental packets. The two factors manipulated in the packets were: disclosure versus nondisclosure of segment data and high-versus low-level price series for common shares of the firms. Stallman's analysis revealed a significant interaction between the two factors. Segment data had their greatest effect on the analysts' decisions when presented with the low-level price series. Stallman concluded that under certain conditions, disclosure of segment data could influence the valuation assessments of financial analysts. Stallman's study was limited in two major areas: (1) he assumed that

analysts do not accept market efficiency and (2) his manipulation of price data to create the high- and low-price series may have contaminated the main independent variable (segment data disclosure).

Ortman [1975] modified Stallman's design using multi-industry firms about to "go public." The result was a two-cell design with analysts categorized as receiving segment or consolidated data. Analysis revealed significant differences in the two groups' per-share valuations. Ortman's study was, however, limited since his manipulations involved radical changes in industry involvement revealed only in the segment data. This could have biased the results.

Twombly [1979] utilized equal-risk portfolios to examine firms exhibiting three levels of segment disclosure: no disclosure, sales only disclosure, and sales and earnings disclosure. Each of the three groups of firms was further divided into three subgroups based on a ratio reflecting competition within the firm's primary industry. The resulting nine risk-equalized portfolios were matched with a control portfolio comparable in risk and degree of industry concentration. Twombly found no evidence of statistically significant differences and concluded that disclosure of segment data provided no unanticipated information to the capital market. However, Twombly's results were limited

since his study included only those companies involved in pre-1970 voluntary disclosure.

Ajinka [1980] extended Twombly's work by examining the effects of pre- and post-1970 segment disclosures on mean returns and the covariance structure of returns. Four groups were included in the study. Two were treatment groups which consisted of multiproduct firms that did not disclose any segment data prior to 1970. The other two were control groups which were multiproduct firms that disclosed segment profit and revenue data both before and after 1970 and single-industry firms not affected by the SEC LOB requirements. Each of the four groups was further partitioned into two subgroups based on whether it had positive or negative earnings forecasts errors.

Ajinka investigated the return behavior of the eight groups during a before and after-LOB period. No significant differences among the mean returns of the portfolios within either period were found. A test of between periods differences also failed to be statistically significant.

Horwitz and Kolodny [1977] studied the mean return effects of LOB data. No significant differences in residual returns were detected between firms that disclosed LOB earnings data and single-industry firms unaffected by the SEC requirements.

These market based studies suffer from methodological problems. In his study, Ajinka [1980] points out that "a priori, it is not possible to predict the direction of the change in the average returns of a portfolio of firms that go from less to more fine information reporting. The primary reason is that, for an individual firm, the mean returns could be revised either upward or downward depending on the nature of the finer information that becomes available. Hence, the individual effects may be largely neutralized at the portfolio level" [p. 359]. Before unveiling the effects of segment disclosure, it may be necessary to first determine whether the segment disclosures are providing good or bad "news" about the firm.

Earnings Prediction Effects Studies. Several studies have addressed the effects of "finer" information systems on predictive accuracy. These will now be discussed.

Smith [1979] looked at the effect of the disaggregation of financial data to the segment level on the forecast accuracy of financial analysts. Subjects were assigned to three groups: (1) no segment disclosure, (2) intermediate segment disclosure, and (3) maximal segment disclosure. Group comparisons indicated that the availability of segment data had a significant impact on accuracy of earnings predictions. The group receiving intermediate level segment disclosure

had significantly more accurate predictions than those in the no segment disclosure group. However, those in the maximal level segment group did not outperform the intermediate level group. These results are supportive of the predictive value of segment disclosures.

The predictive accuracy of published forecasts has also been examined. Barefield and Comisky [1975] calculated and ranked measures of forecast accuracy. Firms were also ranked based on the "quality" (fineness) of their voluntary disclosure of segment data. Barefield and Comisky observed a significant positive correlation between ranking of forecast accuracy and quality of disclosure. These findings support the relationship between predictive effects and the fineness of the data set.

In another study of the accuracy of published forecasts in relation to the disclosure of segment data, Baldwin [1979] compared the accuracy of analysts' forecast before and after the enactment of the SEC's 1970 segment reporting requirements. Earnings forecasts associated with the experimental group (firms required to report segment data under the 1970 rulings) were significantly more accurate for the post 1970 period. No significant differences between periods were found for the control group (firms not affected by the 1970 SEC requirements). Again, the relationship

between disclosure of segment data and predictive accuracy is supported.

The predictive ability of models has also been addressed. Using voluntarily disclosed segment data for 1967 and 1968, Kinney [1971] examined the accuracy of four models in predicting consolidated earnings of each sample firm. Kinney concluded that "predictions based on segment sales and earnings data and industry predictions were on the average more accurate than predictions based on models using consolidated data alone" [p. 136]. However, models incorporating segment sales and earnings did not perform significantly different from those incorporating only segment sales data.

Collins [1976] extended Kinney's study by examining a larger sample of firms and more models. Findings consistent with Kinney include: (1) models incorporating segment data yielded more accurate predictions and (2) adding segment earnings data to models incorporating segment revenues and consolidated profit margins resulted in only a nominal improvement in predictive accuracy.

Silhan [1982] used predictive models to address the value of finer information sets incorporating segment earnings data. In his study, Silhan used a simulation approach to examine the effect of the number of segments on predictive accuracy. No evidence was found to consistently

support the predictive superiority of either consolidated or segment earnings data.

To summarize, studies addressing the predictive accuracy of forecasts have provided evidence that disclosure of segment data can result in improved earnings predictions. These studies provide some indication of the benefits of a finer information set.

The forecast accuracy studies provided the necessary linkage between segment data and earnings prediction necessary to determine whether segment disclosures conveyed good or bad news. Collins [1975], Foster [1975], and Kochanek [1974] used this linkage to categorize firms, thereby eliminating offsetting effects which may have influenced earlier market based studies.

Collins [1975] developed a mechanical trading rule to relate the good or bad news implications of segment data to the firm's abnormal returns. The results indicated no significant relationship between the trading rules comparisons and the abnormal return performance of the sample portfolios for the period April 1967 through March 1970. Since April 1969 through March 1970 was a recessionary period, another analysis was performed on a reduced period eliminating the recessionary months. Results for the reduced period revealed a significant relationship between abnormal returns and segment disclosures for the portfolio of firms which had

not voluntarily disclosed LOB data prior to 1970. Significant differences were not found for a portfolio of firms which had voluntarily disclosed segment revenues before 1970.

Another study of the association between residual returns and the good news/bad news effects of segment disclosure was conducted by Foster [1975]. Each sample firm (all from the insurance industry) was classified as a good news or bad news firm based on the sign of the earnings forecast error resulting from forecast models based on consolidated data. Foster calculated a subearnings cumulative average residual (CAR) statistic which he compared with its consolidated counterpart. Results indicated the subearnings CAR was significantly larger than the consolidated CAR. Foster's study focused on a consolidated versus segment comparison and indicated that return assessment effects could be associated with the availability of a segment data set. Further statements based on the level of detail included in the data set cannot be made.

Kochanek [1974] focused on ways in which the predictive dimension of good versus poor segment disclosures affect the timing of market return assessments. Firms were classified as "good" or "poor" reporters of segment data. Annual EPS changes and four sets of stock price changes were also calculated. For each set of price changes, nonparametric

techniques were applied to four years of earnings and price data, yielding a correlation coefficient for each firm. The coefficients were ranked and a test of no difference in median ranks of good and poor reporters was performed. For each of the four sets, the null hypothesis was rejected. Kochanek's results indicated that an earlier market anticipation of earnings changes was associated with the disclosure of "good" segment data. This study provides further support of a relationship between return assessment, earnings prediction, and the disclosure of a segment data set.

To recap, studies incorporating the good and bad news aspects of segment data and studies examining an association with securities returns are supportive of a relationship between the predictive aspects of segment data and the return assessments of the market.

Variability and Covariability Effects. Theory suggests that a finer information system can influence the decision maker's assessments of the variance/covariance structure of returns [Mohr, 1983]. Research in this area can be divided into two groups: (1) evaluation of the overall variance/covariance relationship and (2) evaluation of the covariability of returns with a market index (beta assessment).

Two studies discussed previously have provided support for the above theoretical assertion by examining the overall

variance/covariance effects. Ortman [1975] found some evidence that segment disclosure was associated with reduced dispersion of the valuation assessments of financial analysts. Ajinka [1980] concluded that "the uniformity and greater fineness of disclosure practices mandated by the SEC's LOB requirements appear to have contributed to a greater consensus among market agents" [p. 351].

Dhaliwal [1978] focused on the levels of certain return variability measures. Multiple regression was used to explain changes in the levels of a return variance measure and a return dispersion measure from a pre-1970 to a post-1970 period. Statistical tests indicated that the coefficient of the dummy variable indicating whether initial disclosure of LOB data occurred before or after 1970 was negative. This implies a variance reduction. Dhaliwal's results suggest an increased consensus among market participants following the SEC's LOB reporting requirements.

Revisions in beta assessment have been suggested as a possible effect of segment disclosure [Mohr, 1983]. However, research addressing beta assessment has yielded conflicting results.

Several studies have examined beta shifts in conjunction with the disclosure of segment data. These include: Horwitz and Kolodny [1977], Simonds and Collins [1978], Dhaliwal [1978], and Ajinka [1981]. Due to conceptual and

methodological problems, these studies have produced mixed results.

Horwitz and Kolodny [1977] were the first to attempt to detect beta shifts of diversified firms associated with the initial disclosure of LOB earnings data. A treatment sample consisted of diversified firms that as a result of the 1970 SEC requirements supplemented their prior disclosure of segment sales with segment earnings data. The control sample consisted of single-industry firms. Comparing the betas of the two groups revealed no significant differences. Horwitz and Kolodny concluded that no relationship existed between beta assessment and the incremental disclosure of segment earnings data.

Collins and Simonds [1978] attempted to overcome the methodological weaknesses of Horwitz and Kolodny's study. A treatment group was added that reported no segment data prior to 1970, after which it was required to by the SEC. A control group was added which reported both segment sales and earnings data before and after 1970. Using various regression techniques, Collins and Simonds observed a downward shift in the betas of the treatment samples. A larger shift was associated with the group which had disclosed no segment data prior to 1970. No significant beta shift was detected for the control groups. In concluding, Collins and Simonds stated "firms with minimal or no prior segmental

disclosures did experience substantive changes in relative risk (beta) within the designated critical SEC LOB disclosure period."

Dhaliwal [1978] also examined changes in beta from a pre to post 1970 period. (This study was discussed in detail earlier.) Dhaliwal observed a downward shift in beta associated with the initial disclosure of LOB data.

Ajinka [1981] used a "split-sample" analysis to study beta effects. Using an initial beta estimation period of January 1964 through December 1967, four sample groups were divided into high, medium, and low beta subgroups. A further partitioning was based on a prerequisite period and a postrequirement period. A significant downward beta shift was found for each of the treatment groups. However, a significant decrease in beta was also found for the multi-segment control group. After further analysis, Ajinka concluded that beta reversion and nonstationarity tendencies confounded the earlier findings of Simonds and Collins.

Two studies have incorporated the good or bad "news" implications of segment data into their methodology to provide some indication of the "direction" of the effects on beta. Kinney [1972] observed a significantly positive association between his diversification measure and market-based betas when the firms were segmented by industry or product-line.

In the other study, Mohr [1981] conducted a beta-association study utilizing Rubinstein's [1973] theoretical model of the relationship between beta assessment and segment data. Mohr's results indicate a significantly stronger relationship between a weighted average beta and an unlevered market-based beta when industry involvement measures were derived from SFAS No. 14 asset disclosures.

In summary, this section has reviewed the variance/covariance effects of segment data. Studies addressing the overall variance/covariance effects of segment data have provided evidence of increased consensus among decision makers when a finer information set is available. However, research addressing beta assessment effects has yielded mixed results.

Behavioral Research and Events Theory

This section reviews a behavioral study by Otley and Dias and the events theory literature to develop theoretical support for the study. A change in decision quality is often incorporated in models of human information processing. Otley and Dias [1982] investigated the interaction of information aggregation and individual cognitive style. Two types of information aggregation were addressed. Type I reduces the amount of data provided to a decision maker without changing the information content while type II

results in a decrease of information content. Otley and Dias hypothesized that a move from highly disaggregated information to more aggregated information will result in improved decision performance if the aggregation is type I. When the aggregation is type II, performance should immediately decline. Subjects acting as plant managers participated in a production simulation game. The required task was to develop a production plan which maximized the plant's contribution to profit. The plan was based on a set of internal accounting reports which differed in the degree of detail for the various experimental groups.

Otley and Dias' findings support their hypothesis. The following comment is relevant to this project:

Our lack of results on the effects of individual differences in cognitive complexity is consistent with most studies in accounting, which also have not succeeded in establishing relationships between cognitive complexity and individual information-processing characteristics. Given these results, it appears that it would be more fruitful for information system designers to concentrate on matching the information content of accounting reports with the type of task being undertaken, rather than attempting to provide information matched to individual characteristics [p. 187].

The effect of the disaggregation of accounting data on decision quality should be determined by the nature of the decision task.

Proponents of the events theory of accounting argue that more detail and less aggregation are needed in

accounting reports [Hendriksen, 1977]. Given more detail, financial-statement users should be able to select the information they want and the level of aggregation they prefer.

According to the events theory, segment cash flow data are preferable to consolidated data. Financial-statement users can choose to incorporate the disaggregated data into their decision models or elect to aggregate the data. If only consolidated cash flow data are available, the users have no choice.

A study by Abdel-khalik [1973] supports the events theory. Abdel-khalik investigated the effect of aggregating accounting reports on the quality of the lending decision. He hypothesized that detailed financial information is more useful for the lending decision. To test his hypothesis, Abdel-khalik sent questionnaires to 600 commercial bank loan officers asking them two types of questions based upon accounting reports differing in the degree of aggregation. One type of question dealt with the allocation of scarce loanable funds to two firms while the other was concerned with making a subjective estimate of the probability of default on each loan.

Abdel-khalik concluded that:

- (a) Users of financial ratios and of aggregated data used in computing these ratios performed rather poorly in the decision task required in

this experiment. They also performed rather poorly on all the quality criteria, including the predictive probability of default. (b) Whenever the firm is marginal, the disaggregation of its financial report provides users with better risk indicators. Thus, as shown by research in other fields, more detailed financial reports are preferred [p. 135].

In concluding, Abdel-khalik recommended that further research be conducted to replicate his findings for other decision tasks and for other firms.

Abdel-khalik's study indicates that the level of aggregation is an important factor in the lending decision. Based on the findings of Otley and Dias and Abdel-khalik, the lending decision appears to be an appropriate task to incorporate into a study of the effect of segment funds data on the decisions of financial-statement users.

Summary

Empirical research is needed to determine the impact of segment cash flow disclosure on financial-statement user's decisions. According to the events theory of accounting, a finer, more detailed, information system allows financial-statement users to choose the level of aggregation they wish to use as input for their decision models. Empirical research conducted to determine the utility of the segment level disclosures now available indicates that users choose to include these disclosures in their decision models. Not

only is the segment data used but the research indicates that they are useful because decision quality may be improved.

The utility of an even finer information system, one which includes a segment cash flow statement, cannot be directly examined since this information is not currently disclosed. However, the impact of segment cash flow disclosure on financial-statement user's decisions can be studied. The following chapter describes in detail the methodology used in this study which addressed whether segment cash flow data influence the lending decision.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

A field experiment was conducted to examine the impact of segment cash flow data on the lending decision. One-way multivariate analysis of variance (MANOVA) was used to determine if the amount of credit granted by commercial bank loan officers and the interest rate charged were affected by the type of segment cash flow data available. A summary of the experimental design appears in Table 1.

MANOVA

Since the dependent variables, amount of the loan granted and the interest rate charged, are measurable on interval scales and the independent variable, the type of segment cash flow data available, is categorical, MANOVA was used to determine the effect of the independent variable. The SAS System was used to analyze the data.

In the experimental questionnaire, the loan officers were asked to make two decisions: (1) the amount they would loan the company and (2) the increment above the appropriate prime rate they would charge for the loan. When a loan officer did not grant a loan, no decision for the increment

TABLE 1

Definitions of Dependent and Independent Variables

DEPENDENT VARIABLES: No loan (a dummy variable indicating whether or not a loan was made), amount of the loan granted by the commercial bank loan officers, and the interest rate charged by the commercial bank loan officers.

INDEPENDENT VARIABLE: The type of segment cash flow data supplied to the commercial bank loan officers.

GROUP 1, the control group, received only the segment cash flow disclosures required by GAAP.

GROUP 2, the soft drinks group, received the segment cash flow disclosures required by GAAP plus a complete segment cash flow statement indicating that:

- 1) A stable industry (soft drinks) had been the sole source of cash for the past three years.
- 2) An industry currently in serious trouble (farm machinery and equipment) had been a user of cash for the past three years.

GROUP 3, the farm group, received the segment cash flow disclosures required by GAAP plus a complete segment cash flow statement indicating that:

- 1) An industry currently in serious trouble (farm machinery and equipment) had been the sole source of cash for the past three years.
 - 2) A stable industry (soft drinks) had been a user of cash for the past three years.
-

above the prime rate was required, thereby creating missing values for this variable.

To overcome this problem, three dependent variables were used in the MANOVA analysis. A dummy variable, which will also be called no loan, was added which represented whether the loan was made. A one was assigned to the dummy variable if no loan was made; a zero was assigned to the dummy variable when the loan was made. A prime rate was added to the increment above the prime to arrive at the interest rate charged for the loan. A prime rate of 7.5 percent was obtained from an edition of the Wall Street Journal for a date falling within the survey period. (The prime rate ranged from 8.5 percent at the beginning of the survey period to 7.5 percent at the end of the survey period.) To summarize, the three dependent variables were: no loan, the amount of the loan, and the interest rate charged.

Adding the dummy variable allowed all decisions to be included in the MANOVA analyses. The three dependent variables took on the following values if no loan was granted:

1-0-0

When a loan was granted, the dependent variables were coded as follows.

0-amount of loan-rate charged

An argument can be made that using these variables in a MANOVA violates the multivariate normality assumption. However, given the relatively large number of observations (117), the multivariate central limit theorem helps assure that the consequences of such violations are minor [Seber, 1985].

The Design

The design used is similar to the posttest-only control group design described by Campbell and Stanley [1963] and can be illustrated as follows:

$R_{\text{control}} \quad \times \quad O$

$R_{\text{soft drinks}} \quad \times \quad O$

$R_{\text{farm}} \quad \times \quad O$

where R = random assignment

X = exposure of a group to a particular type of segment cash flow disclosure, as shown in Table 1.

O = observation or measurement

According to Campbell and Stanley, the strengths of this true experimental design include:

- (1) Equivalent groups are achieved by randomization.
- (2) The major threats to internal validity are all controlled for (i.e., history, selection, etc.).
- (3) Interaction of testing and X are controlled which strengthens external validity [pp. 25-26].

The Dependent Variables. Previous research studies in accounting involving the lending decision have used a variety of dependent variables. These variables include: amount of the loan [Abdel-khalik, 1973 and Maksy, 1984], probability of default [Abdel-khalik, 1973 and Maksy, 1984], a prediction of whether the company would default on a loan [Abdel-khalik and El-Sheshai, 1980], a prediction of whether the company would go bankrupt [Casey, 1980], the interest rate premium above the prime to be charged [Maksy, 1984 and Johnson and Pany, 1984], and whether the loan should be made [Campbell, 1984]. After interviewing several loan officers, the amount of the loan granted and the premium charged above the appropriate prime rate were chosen as the most realistic tasks to request the loan officers to perform.

The Independent Variable. The independent variable was the type of segment cash flow data available. There were three levels of this variable: (1) the limited segment cash flow disclosures presently required under GAAP, (2) complete segment cash flow disclosures indicating that the primary source of cash for the past three years had been a segment

operating in a stable industry (soft drinks), and (3) complete segment cash flow disclosures indicating that for the past three years the primary source of cash had been a segment operating in an industry currently in serious trouble (farm machinery and equipment).

Loan officers in the control group received consolidated financial statements as well as segment disclosures required by SFAS No. 14 (sales, operating profit, identifiable assets, capital expenditures, and depreciation and amortization expense). Therefore, the only indicators of segment cash flow were capital expenditures, depreciation and amortization expense, and possibly operating profit (some may argue that this is a reasonable estimate of segment net income). Since these components of segment cash flow are currently available, they were not manipulated across the three levels. This aided in determining whether the additional disclosure recommended was considered by the bankers to have information content.

In addition to the above information, loan officers assigned to the test groups received a segment cash flow statement. The company used in the study consisted of two segments. The soft drinks group's segment cash flow information revealed that the soft drinks segment had been the sole source of cash for the past three years while the farm machinery and equipment segment had been a user of cash.

The farm group's segment cash flow information revealed that the farm machinery and equipment segment had been the sole source of cash while the soft drinks segment had been a user of cash for the past three years.

Information obtained during interviews with commercial bank loan officers led to the selection of a segment in a stable industry and a segment in an industry currently in serious trouble to make up the experimental company. If one of the industries had been a growth industry, this may have led the loan officers to simply grant the entire amount of the loan with limited financial statement analysis. Choosing a stable industry and an industry in serious trouble forced a more careful analysis of the company. Consolidated financial statements indicated that the company was performing at the average for the industries involved and was in good overall financial condition.

An effort was made to make the financial statements appear to represent a real company, thereby making the experimental task more realistic for the loan officers. To accomplish this, a separate set of statements was constructed for each of the two industries involved. These two sets of statements were developed using the average industry financial ratios published by the Robert Morris Associates. After completing the two sets, they were consolidated. Then different sets of industry segment data were developed to

provide the necessary experimental manipulations (i.e., which industry was the primary source of cash). Annual reports of companies operating in the soft drinks and farm machinery and equipment industries were also studied to arrive at ways of making the statements appear to represent a real company.

Two segments were used for several reasons. Using two segments helped to limit company size. This is important because commercial bank loan officers perceive size to be an important factor in determining the probability that a loan will be repaid. Limiting size reduced the availability of collateral, thereby forcing a more careful evaluation of other factors. The experimental design was also simplified by using only two segments. This facilitated the interpretation of the results. By using two segments, the size of the experimental instrument was reduced; this made the requested task appear to require less time which probably increased the response rate.

Sample Selection

The sample was selected from commercial bank loan officers at the nation's 300 largest commercial banks. The largest banks were chosen since they are most likely to do business with diversified companies. Another reason for

choosing the largest banks was to limit the sample to those who on average should be more sophisticated loan officers.

A list of the 300 largest commercial banks was obtained from the 1985 edition of The Rand McNally International Banker's Directory. Six banks located in Puerto Rico were removed from the list because these banks may have different frames of reference from those in the United States. For each of the 294 remaining banks, the following information was obtained from the directory:

1. Name of a senior officer.
2. Address.
3. Telephone number.

An attempt was made to select the senior officer at each bank most likely to be involved in commercial lending. The most common positions selected were the top ranking officer listed in:

1. Commercial lending.
2. Corporate division.
3. Loans.

The senior officer selected at each bank was sent a letter requesting that his or her bank participate in the study. (A copy of the letter is included in Appendix A). To avoid the possibility of sensitizing subjects who would later receive the experimental questionnaire, the purpose of

the study was stated as determining methods of improving reporting for diversified companies.

If the bank chose to participate, the senior officer was asked to supply the name(s), address(es), and telephone number(s) of one or more commercial bank loan officers to whom a copy of the questionnaire could be sent. A response form was provided on which to supply the information. Senior officers who chose to participate were asked to include their names on the response form. The loan officers recommended were to be experienced in financial statement analysis and have the authority to make, or participate in the decision to make, loans in the five to ten million dollar range. After the response forms were returned, the loan officers listed on the forms were randomly assigned to the three groups.

The letter to the senior officers included other important points. All names supplied were to be held in strict confidence and were to be used only by the researcher. All individual responses to the experimental questionnaire were to be held in strict confidence and were to be used only to develop statistical tables. A copy of the results of the study would be mailed to the senior officer if the appropriate box was checked on the response form.

Letters were sent to senior officers at the 294 banks requesting the bank's participation in the study. After two

mailings, 127 banks responded. Of these, 90 indicated an interest in participating. The banks which responded "no" gave the following reasons:

--One bank had merged with another bank that was participating.

--Seven banks did not deal with large diversified companies.

--Twenty-nine banks gave no reason.

The senior officers at the 90 participating banks recommended 167 (includes three of the senior officers) loan officers to serve as subjects. The maximum number of participants from any bank was four. Each of the 167 loan officers was randomly assigned to one of the three experimental groups and was mailed the case for that group along with the experimental questionnaire.

Description of the Survey Instrument

The loan officers whose names were provided by the senior officers were mailed a packet containing a cover letter, the financial information on which to base their decisions, the experimental questionnaire, and a post experimental questionnaire. (Copies of each version of the survey instrument are provided in Appendix A.) The cover letter briefly explained the purpose of the study and requested the recipient's cooperation. The loan officers were told that their names had been supplied by a senior officer at their bank who had indicated an interest in their bank's

participation in the project. A special effort was made to avoid drawing attention to the segment cash flow data and thereby sensitizing the loan officers to the experimental variable. The study's purpose was again stated as an investigation of ways to improve reporting for diversified companies.

Each of the three groups received different sets of financial information as discussed in a previous section. An attempt was made to supply enough information to keep the task as realistic as possible and to permit the subjects to make the required decisions. Each subject received the following information:

1. A brief history of the company including a description of the business of each segment.
2. Information about management.
3. Three years of consolidated income statements.
4. Three years of consolidated balance sheets.
5. Three years of consolidated statements of changes in financial position prepared on the cash basis.
6. Selected footnotes for the current year's financial statements.
7. Three years of segment disclosures required by GAAP (sales, operating profit, identifiable assets, depreciation and amortization expense, and capital expenditures).

The decision to provide this information was based on a review of the relevant literature and interviews with commercial bank loan officers. Members of the test groups also received segment cash flow statements.

In addition to those discussed previously, the following controls were incorporated into the experimental design:

1. Only the independent variable, the type of segment cash flow data available, changed across cells. The information on company history and management remained constant.

2. To prevent size from acting as a confounding factor, the two segments were of roughly equal size.

Using the enclosed information, each loan officer was asked to make three independent decisions in the experimental questionnaire. First, the subjects were asked to make a recommendation for a six-month working capital loan if the company requested \$1,000,000. The purpose of the loan was given as the seasonal purchase of sugar and syrup for the soft drinks division. Then a decision was requested for a three-year term loan if the company requested \$5,000,000. The purpose of the loan was given as the purchase of equipment for the soft drinks division. Finally, a decision for a seven-year \$8,000,000 term loan was requested. The purpose of the loan was given as expanding plant capacity for the soft drinks division. The request for a seven-year \$8,000,000 term loan should have encouraged the subjects to carefully evaluate the company's financial condition. For each of the three decisions, the subjects were asked to provide the amount they would be willing to loan the company

and the increment above the appropriate prime rate they would charge.

After making their decisions, the loan officers were asked to answer several questions. The purpose of the questions was to determine the extent the loan officers thought the segment cash flow information influenced their decisions and to collect selected demographic data. This section included questions concerning the relative importance of several financial statement items to avoid sensitizing the subjects to the experimental variable.

Pilot Test

In order to increase the probability of conducting a successful research effort, several steps were completed before mailing the questionnaire to a large number of subjects. To insure that the experimental task would be as realistic as possible, the researcher reviewed the literature on the lending decision and interviewed several loan officers. Based on the literature review and interviews, the survey instrument was designed to include the types of information loan officers use and the types of decisions loan officers actually make. The questionnaire was then pretested by a senior officer at a bank included in the sample, and changes were made based on his recommendations. Next, a pilot test consisting of surveying a small sample of

commercial bank loan officers (13 loan officers representing 6 banks) was conducted in order to determine whether the experimental manipulations appeared to be successful. Another purpose of the pilot test was to uncover any errors or ambiguities in the survey instrument before mailing it to a large sample.

The pilot test was mailed to thirteen commercial loan officers at banks in Tennessee and North Carolina where senior officers had responded to the first mailing of the letter requesting the bank's participation. Commercial loan officers who were recommended following a second mailing to the senior officers were mailed questionnaires when the larger (main) sample was surveyed. Results from the pilot test indicated that the bankers felt comfortable with the task. No request was consistently made for any data not included in the questionnaire. The subjects' responses also indicated that the experimental manipulations appeared to be working and that the questionnaire did not contain any errors or ambiguities.

The Main Survey

In July 1986, the survey instrument was mailed to 154 commercial bank loan officers recommended by senior officers at the participating banks. Four weeks after the initial mailing, nonrespondents were sent a second questionnaire,

and their cooperation was again requested. In the cover letter, the subjects were asked to complete the questionnaire and return it in the enclosed postage-paid envelope or to telephone the researcher (whose telephone number was included) with their responses. Most elected to mail the questionnaire, but two participants telephoned their responses. Another subject telephoned to ask whether he could use information not provided in the case (i.e., industry average ratios); he was instructed to use any information normally used in making similar decisions. The subject later returned his completed questionnaire in the mail. After two mailings, 117 loan officers representing 78 banks (includes usable responses from the pilot test) returned their questionnaires. Table 2 summarizes the response form and questionnaire response rates. In Table 3, response is summarized by group.

Statistical analyses included an early/late test for nonresponse bias. The t-test procedure was used to determine whether significant differences existed between responses of subjects who returned their questionnaire after one request and those who responded following a second request. A t-statistic was computed for each group. A significant difference was found only for the amount loaned within group two; late responders loaned significantly less

TABLE 2
Response Rates

	Number of Loan Officers	Number of Banks
Response Forms Mailed	N/A	294
Response Forms Returned	N/A	127
Percentage of Response Forms Returned	N/A	43%
Banks Agreeing to Participate	N/A	90
Percentage of Banks Agreeing to Participate	N/A	31%
Questionnaires Mailed	167	90
Questionnaires Returned	117	78
Percentage of Questionnaires Returned	70%	87%

TABLE 3
Response by Group

	Number of Loan Officers
Control	41
Soft Drinks	37
Farm	39
Total	117

than those who responded early. All other tests revealed no significant differences between early and late responders.

Demographic Characteristics of the Subjects

For each respondent, data on years of experience in commercial banking, number of accounting courses taken, and the highest degree earned were collected in the questionnaire. Years of experience, accounting courses taken, and the highest degree earned were used as covariates to determine whether these variables influenced the loan decisions. Their impact on the emphasis that loan officers placed on the balance sheet, income statement, cash flow data, and industry segment data for the short-term, intermediate-term, and long-term loan decisions were also examined. Results of these analyses can be found in Appendixes B and C. Tables 4, 5, and 6 contain descriptive statistics for the demographic variables.

Hypotheses Tested

Three between-group hypotheses were tested. If the additional segment cash flow disclosure supplied to the soft drinks group increased the perceived probability that the company could generate adequate cash to repay the loan, this group should have made more loans, loaned more money, and/or charged lower rates of interest than the control group.

TABLE 4

Years of Experience in Commercial Banking

Years	Control	Soft Drinks	Farm	Total
1	1	1	1	3
2	2	3	2	7
3-5	9	3	8	20
6-10	15	15	14	44
11-15	4	7	4	15
16-20	5	3	5	13
20+	4	2	5	11
N	40	34	39	113
Mean	10.2	10.1	11.4	10.6
Standard Deviation	7.1	6.0	7.8	7.0

TABLE 5
Accounting Courses Taken

Courses	Control	Soft Drinks	Farm	Total
1-2	11	5	9	25
3-4	13	11	13	37
5-8	13	14	11	38
9-12	3	7	5	15
18+	1	0	1	2
N	41	37	39	117
Mean	4.85	6.05	4.56	5.14
Standard Deviation	3.3	3.8	3.3	3.5

TABLE 6
Highest Degree Earned

Degree	Control	Soft Drinks	Farm	Total
High School (1)	1	0	1	2
Some College (2)	2	2	0	4
Bachelor's (3)	15	15	16	46
Some Graduate (4)	0	1	0	1
Master's (5)	21	18	21	60
Doctorate (6)	1	0	0	1
N	40	36	38	114
Mean	4.0	4.1	4.0	4.0
Standard Deviation	1.2	1.0	1.1	1.1

Hypothesis 1:

$$\mu_D \text{ SOFT DRINKS} < \mu_D \text{ CONTROL}$$

$$\mu_A \text{ SOFT DRINKS} > \mu_A \text{ CONTROL}$$

and/or

$$\mu_R \text{ SOFT DRINKS} < \mu_R \text{ CONTROL}$$

where μ_D = mean for the dummy variable

μ_A = mean amount loaned, and

μ_R = mean interest rate charged

For the loan officers in the farm group, the additional disclosure should have revealed a potential cash flow problem. If expectations changed, the company should have been regarded as more risky. Loan officers in this group should have made less favorable loan decisions than the control group. The farm group should have made fewer loans, loaned less money, and/or charged higher interest rates.

Hypothesis 2:

$$\mu_D \text{ FARM} > \mu_D \text{ CONTROL}$$

$$\mu_A \text{ FARM} < \mu_A \text{ CONTROL}$$

and/or

$$\mu_R \text{ FARM} > \mu_R \text{ CONTROL}$$

For the preceding reasons, the soft drinks group should have made more favorable loan decisions than the farm group.

Hypothesis 3:

$$\mu_D \text{ SOFT DRINKS} < \mu_D \text{ FARM}$$

$$\mu_A \text{ SOFT DRINKS} > \mu_A \text{ FARM}$$

and/or

$$\mu_R \text{ SOFT DRINKS} < \mu_R \text{ FARM}$$

Within-group hypotheses were also tested. Since the disclosure of segment cash flow data should decrease uncertainty by revealing which industry has been the primary source of cash, members of the test groups should have displayed more consensus (less variance) in their decisions than those in the control group. Within-group hypotheses were tested using a variable developed from the MANOVA discriminant functions. These variables will be discussed later in detail.

Hypothesis 4:

$$\sigma^2_{\text{SOFT DRINKS}} < \sigma^2_{\text{CONTROL}}$$

Hypothesis 5:

$$\sigma^2_{\text{FARM}} < \sigma^2_{\text{CONTROL}}$$

where σ^2 = variance of the discriminant function variable.

After the data were collected, the above hypotheses were tested, using MANOVA to test for significant differences in means and procedures developed by O'Brien [1981] and Brown and Forsythe [1974] to test for significant differences in variances.

Summary

This chapter has described the research design and methodology used to determine the impact of a segment cash flow statement on the lending decision. Loan officers at participating banks were mailed case studies differing only in the type of segment cash flow disclosure. The control group received only the segment cash flow disclosures required by GAAP. Members of the test groups received a complete segment cash flow statement. The soft drinks group's cash flow statement indicated that a stable industry, soft drinks, had been the sole source of cash for the past three years. The farm group's cash flow statement indicated that an industry in serious trouble, farm machinery and equipment, had been the sole source of cash. Based on the case, the loan officers were asked to make a preliminary loan recommendation.

Loan officers from 90 of the nation's 300 largest commercial banks served as subjects. Questionnaires were mailed to loan officers who had been recommended by a senior officer at their bank. The loan officers recommended were randomly assigned to one of the three groups. Completed questionnaires were returned by 117 loan officers representing 78 banks.

MANOVA was used to determine if the independent variable, the type of segment cash flow data available, had an effect on the loan decisions. The dependent variables were a dummy variable indicating whether or not a loan was granted, the amount loaned, and the interest rate charged. Statistical tests were also conducted to determine whether the test groups, soft drinks and farm, displayed more consensus in their decisions than the control group did. In Chapter 4, the results of these tests are presented and discussed.

CHAPTER 4

RESULTS

In this chapter, the results of the data analyses are presented and discussed. Analyses include: tests for mean differences, tests for variance effects, and an analysis of the importance of various financial statement items in short-term, intermediate-term, and long-term lending decisions.

MANOVA

MANOVA was used to determine if the loan decisions of the three groups were affected by the type of segment cash flow data available for each of the three independent decisions (short-term, intermediate-term, and long-term) the subjects were asked to make. In each analysis, the dependent variables were the no loan variable (a dummy variable indicating whether a loan was granted), the amount loaned, and the interest rate charged. The type of segment cash flow data was the independent variable.

Group means for each of the dependent variables are presented in Table 7. For all three decisions, the soft drinks group granted more loans than the control group which granted more loans than the farm group. Recall that the

TABLE 7
Dependent Variable Means by Group

	Control	Soft Drinks	Farm
Short-term Decision			
No Loan	.02	0.0	.05
Amount when loan was granted	1,000,000	1,000,000	929,756
Rate when loan was granted	8.09	8.02	7.95
Intermediate-term Decision			
No Loan	.22	.05	.23
Amount when loan was granted	2,933,333	2,884,615	2,814,285
Rate when loan was granted	8.49	8.39	8.49
Long-term Decision			
No Loan	.20	0.0	.28
Amount when loan was granted	7,090,909	7,000,000	7,335,294
Rate when loan was granted	8.85	8.68	8.83

dummy variable, no loan, took on a value of one when a loan was not granted and a value of zero when a loan was made. Therefore, the means for the dummy variable represent the percentage of loan officers who did not grant a loan in that group. When the loan was granted, the farm group loaned less money than the other groups when the decision task was a short-term or intermediate-term loan. For the long-term decision, the farm group loaned more money than the control group which loaned more money than the soft drinks group. The differences in rate are apparently trivial for all the decision types. MANOVA was used to determine if these differences are significant; Table 8 summarizes the results.

The MANOVA results indicate that the type of segment cash flow data had a significant impact on the short-term and long-term loan decisions. Nonparametric statistics (see Appendix D) paralleled these findings and also indicate that the experimental manipulation may have had an impact on the intermediate-term loan decision. Univariate statistics also indicate significant differences between groups for the no loan variable.

The Assumption of Homogeneity of Variance. MANOVA testing is based on the assumption that each of the experimental groups has approximately the same variance/covariance matrix. Tests for equality of the variances (to be

TABLE 8
MANOVA Results--Pillai's Trace

	F	df	p
Short-term Decision	2.02	6, 222	.06*
Univariate Statistics:			
No Loan	.97	2	.38
Amount when a loan was granted	3.88	2	.02*
Rate when a loan was granted	.75	2	.48
Intermediate-term Decision	1.56	6, 218	.16
Univariate Statistics:			
No Loan	2.74	2	.07*
Amount when a loan was granted	.79	2	.46
Rate when a loan was granted	1.64	2	.20
Long-term Decision	2.14	6, 206	.05*
Univariate Statistics:			
No Loan	6.05	2	.003*
Amount when a loan was granted	.28	2	.76
Rate when a loan was granted	.45	2	.64

*Significant at .10 level

discussed later in detail) revealed that this assumption is violated. However, research has shown that the test statistics used here are fairly robust as long as of the groups' sample sizes are comparable [Olson, 1976]. As illustrated in Table 3 (page 58), cell sizes were nearly equal in this study; therefore, the use of MANOVA seems appropriate.

Next, the hypotheses developed in Chapter 3 were tested. Cell means contrasts were used to determine whether significant differences in the dependent variable means existed between the groups specified.

Test of Hypothesis 1. If the segment cash flow statement supplied to the soft drinks group increased the loan officers' confidence in the company, as discussed in Chapter 3, there should be significant differences between the loan decisions of this group and the control group. The soft drinks group should have made more favorable loan decisions than the control group.

Hypothesis 1:

$$\mu_D \text{ SOFT DRINKS} < \mu_D \text{ CONTROL}$$

$$\mu_A \text{ SOFT DRINKS} > \mu_A \text{ CONTROL}$$

and/or

$$\mu_R \text{ SOFT DRINKS} < \mu_R \text{ CONTROL}$$

where μ_D = mean for the no loan variable

μ_A = mean amount loaned, and

μ_R = mean interest rate charged

The results of this test are summarized in Table 9.

For the short-term decision, the soft drinks group and the control group did not make significantly different decisions. However, the emphasis placed on industry segment data and on cash flow data is dependent on the term of the loan. The shorter the term of the loan, the less loan officers rely on these types of data. Short-term decisions are based primarily on balance sheet data. Empirical evidence supporting these statements will be provided later (see pages 91-98). Since the balance sheet indicated that the company was currently in good overall financial condition, the above results are not surprising. Industry segment cash flow data indicating that a soft drinks segment was the source of cash was interpreted as "good news" and confirmed the balance sheet message. Both groups felt that the company could generate adequate cash to repay a six-month working capital loan.

The MANOVA results indicate that the intermediate-term loan decisions of the soft drinks group and the control group were not significantly different. However, univariate statistics indicate that the soft drinks group granted significantly more loans than the control group did.

TABLE 9

Hypothesis 1--Soft Drinks Versus Control
(MANOVA--Pillai's Trace)

	F	df	p
Short-term Decision (2T)	.28	3,110	.84
Univariate Statistics:			
No Loan (1T)	.49	1	.24
Amount when a loan was granted	.00	1	CR
Rate when a loan (1T) was granted	.36	1	.28
Intermediate-term Decision (2T)	1.99	3,108	.12
Univariate Statistics:			
No Loan (1T)	4.03	1	.02*
Amount when a loan was granted	.30	1	CR
Rate when a loan was granted (1T)	.44	1	.26
Long-term Decision (2T)	2.09	3, 102	.10*
Univariate Statistics:			
No Loan (1T)	5.50	1	.01*
Amount when a loan was granted	.05	1	CR
Rate when a loan was granted (1T)	.73	1	.20

*Significant at .10 level

CR: cannot reject because mean difference was not in
hypothesized direction

1T: one-tailed test

2T: two-tailed test

Significantly different decisions were made by the soft drinks and the control group for the long-term decision. Univariate statistics indicate that the no loan variable was significantly lower for the soft drinks group indicating that they made more loans. These results indicate that the soft drinks group made more favorable long-term loan decisions than the control group did and support hypothesis one.

The results for the long-term decision suggest that when loan officers are supplied with only the consolidated and limited segment cash flow disclosures required by GAAP they make conservative (pessimistic) predictions of a diversified company's future cash flows. When supplied with additional segment cash flow data which reveal that a segment operating in a stable industry is the primary source of cash, loan officers interpret this as "good news" and adjust their estimates. This type of disaggregated data appears to increase their confidence in the company's ability to generate adequate cash to repay the loan; they are more likely to make favorable loan decisions.

Test of Hypothesis 2. Next, MANOVA was used to test for differences in means between the farm group and the control group.

Hypothesis 2:

$$\mu_D \text{ FARM} > \mu_D \text{ CONTROL}$$

$$\mu_A \text{ FARM} < \mu_A \text{ CONTROL}$$

and/or

$$\mu_R \text{ FARM} > \mu_R \text{ CONTROL}$$

The results are summarized in Table 10. For the short-term decision, the farm group made significantly different loan decisions than the control did. Univariate statistics indicate that when a loan was granted the farm group loaned significantly less money than the control group did. For the short-term decision, hypothesis two is supported since the farm group made less favorable decisions than the control group did. Although "good news" did not affect the short-term decision, "bad news" did. Despite the strong balance sheet position of the company, the "bad news" changed expectations, and the loan officers loaned less to the company whose cash was being generated by an industry in serious trouble.

For the intermediate-term and long-term decisions, the null hypothesis of no effect could not be rejected; the farm and control groups did not make significantly different decisions. As previously discussed, loan officers in the control group appear to have made conservative estimates of the company's ability to generate cash in future periods. Segment cash flow data indicating that an industry in

TABLE 10
Hypothesis 2--Farm Versus Control
(MANOVA--Pillai's Trace)

	F	df	p
Short-term Decision (2T)	3.01	3,110	.03*
Univariate Statistics:			
No Loan (1T)	.50	1	.24
Amount when a loan was granted (1T)	5.88	1	.01*
Rate when a loan was granted	1.50	1	CR
Intermediate-term Decision (2T)	1.20	3,108	.31
Univariate Statistics:			
No Loan (1T)	.00	1	.47
Amount when a loan was granted (1T)	1.57	1	.11
Rate when a loan was granted	.00	1	CR
Long-term Decision (2T)	.53	3, 102	.66
Univariate Statistics:			
No Loan (1T)	1.40	1	.12
Amount when a loan was granted	.27	1	CR
Rate when a loan was granted	.03	1	CR

*Significant at .10 level

CR: cannot reject because mean difference was not in hypothesized direction

1T: one-tailed test

2T: two-tailed test

serious trouble had been the source of cash for the past three years reinforced these estimates. The additional disclosure did not change expectations and therefore did not result in significant changes in the loan officers' decisions.

Test of Hypothesis 3. Results of tests of hypothesis three are consistent with the other contrasts and are presented in Table 11.

Hypothesis 3:

$$\mu_D \text{ SOFT DRINKS} < \mu_D \text{ FARM}$$

$$\mu_A \text{ SOFT DRINKS} > \mu_A \text{ FARM}$$

and/or

$$\mu_R \text{ SOFT DRINKS} < \mu_R \text{ FARM}$$

For the short-term decision, the soft drinks and farm groups made significantly different decisions. Univariate statistics reveal that the soft drinks group made more loans and loaned significantly more money when a loan was made. For the intermediate-term decision, the null of no effect could not be rejected. However, univariate statistics indicate that the soft drinks group granted significantly more loans than the farm group did. Results of long-term tests indicate that the two groups made significantly different decisions. Univariate statistics reveal that the soft drinks

TABLE 11
Hypothesis 3--Soft Drinks Versus Farm
(MANOVA--Pillai's Trace)

	F	df	p
Short-term Decision (2T)	2.94	3,110	.04*
Univariate Statistics:			
No Loan (1T)	1.95	1	.09*
Amount when a loan was granted (1T)	5.80	1	.01*
Rate when a loan was granted	.38	1	CR
Intermediate-term Decision (2T)	1.46	3, 108	.23
Univariate Statistics:			
No Loan (1T)	4.26	1	.02*
Amount when a loan was granted (1T)	.54	1	.24
Rate when a loan was granted (1T)	.47	1	.25
Long-term Decision (2T)	4.31	3, 102	.007*
Univariate Statistics:			
No Loan (1T)	11.75	1	.0005*
Amount when a loan was granted	.54	1	CR
Rate when a loan was granted (1T)	.53	1	.23

*Significant at .10 level

CR: cannot reject because mean difference was not in hypothesized direction

1T: one-tailed test

2T: two-tailed test

group granted more loans. The soft drinks group made more favorable loan decisions than the farm group for the short-term and long-term loan decisions; these results support hypothesis three.

Summary. Relevance is defined in SFAC No. 2 [FASB, 1980] as the ability to influence a decision either by changing expectations or by confirming expectations. Since significant differences in group means were found, the relevance of segment cash flow data is supported. For the long-term decision, the "good news" that the soft drinks segment was the primary source of cash changed expectations resulting in more favorable loan decisions than those made by the control group. The soft drinks group's expectations were also different from those of the group which received the "bad news" that the farm machinery and equipment segment was the primary cash source. Therefore, the study indicates that segment cash flow data are relevant for long-term lending decisions.

For the short-term lending decision, the "bad news" that the farm machinery and equipment segment was the source of cash changed expectations. Loan officers in the group which received this information made less favorable decisions than those in the control group; their decisions were also less favorable than the soft drinks group's. This

indicates that segment cash flow data are also relevant when the decision task is a short-term loan.

The Discriminant Functions. Discriminant analysis allows calculation of alpha weights for each dependent variable. Discriminant functions can be developed based on these alpha weights provided by SAS. For this study, these functions are:

Short-term Decision =

$$1.147(\text{No Loan}) + .0876(\text{Rate}) + .00000069(\text{Amount})$$

Intermediate-term Decision =

$$.317(\text{No Loan}) - .007(\text{Rate}) + .000000062(\text{Amount})$$

Long-term Decision =

$$.198(\text{No Loan}) - .013(\text{Rate}) + .00000000456(\text{Amount})$$

Using these functions, canonical variables can be developed for each decision type which incorporate the information contained in all three dependent variables. These variables are plotted by group in Figures 1, 2, and 3.

Discussion of the Canonical Variables. Plots of the canonical variables illustrate the differences in group means, the range of loan decisions, and the frequency of various decision types by group. Figure 1, a graph of the short-term canonical variable by group, indicates that the farm group made different loan decisions than the other groups. The graph also illustrates that the soft drinks group displayed more consensus in their decisions than the

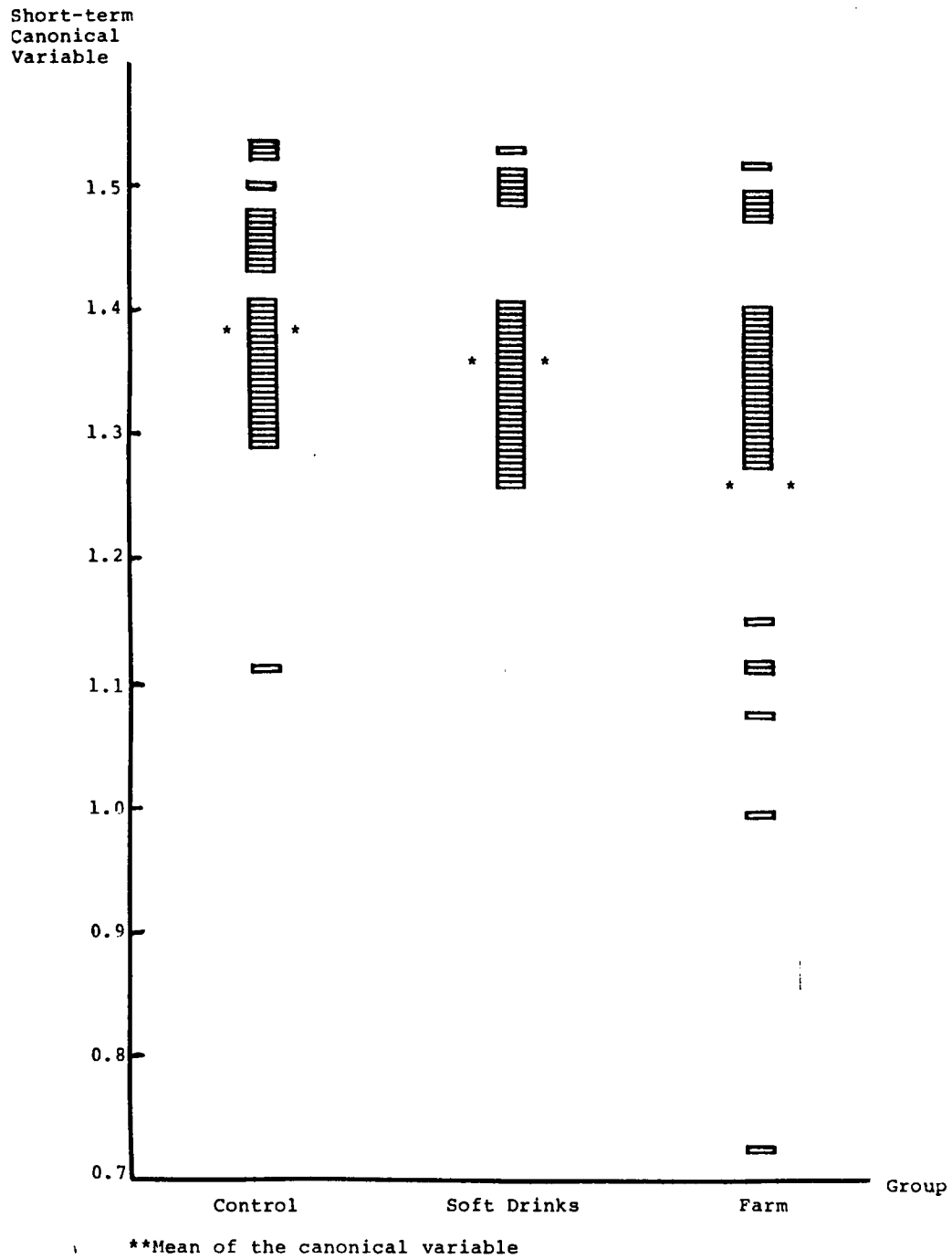


FIGURE 1

Plot of Short-term Canonical Variable by Group

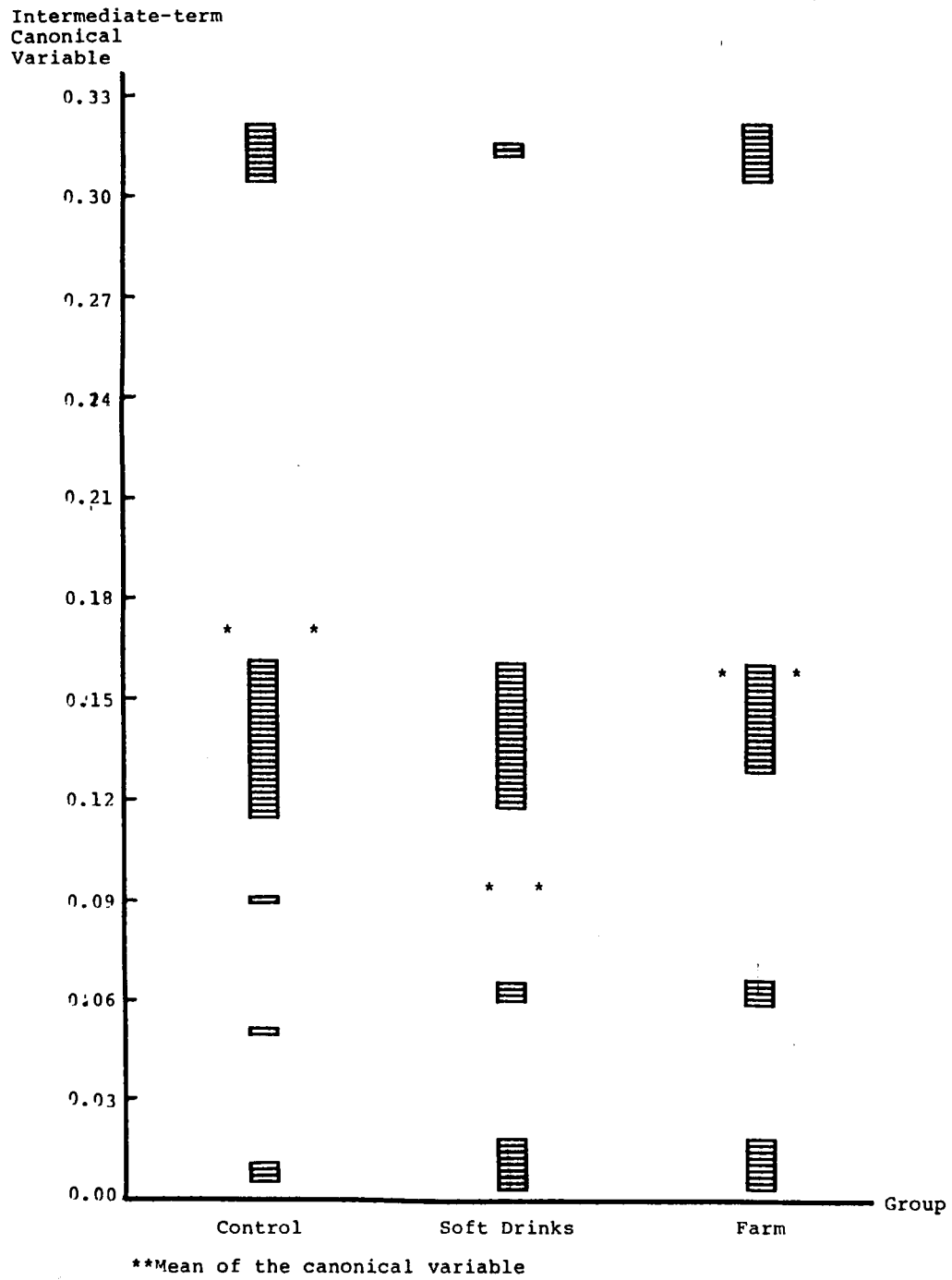


FIGURE 2

Plot of Intermediate-term Canonical Variable
by Group

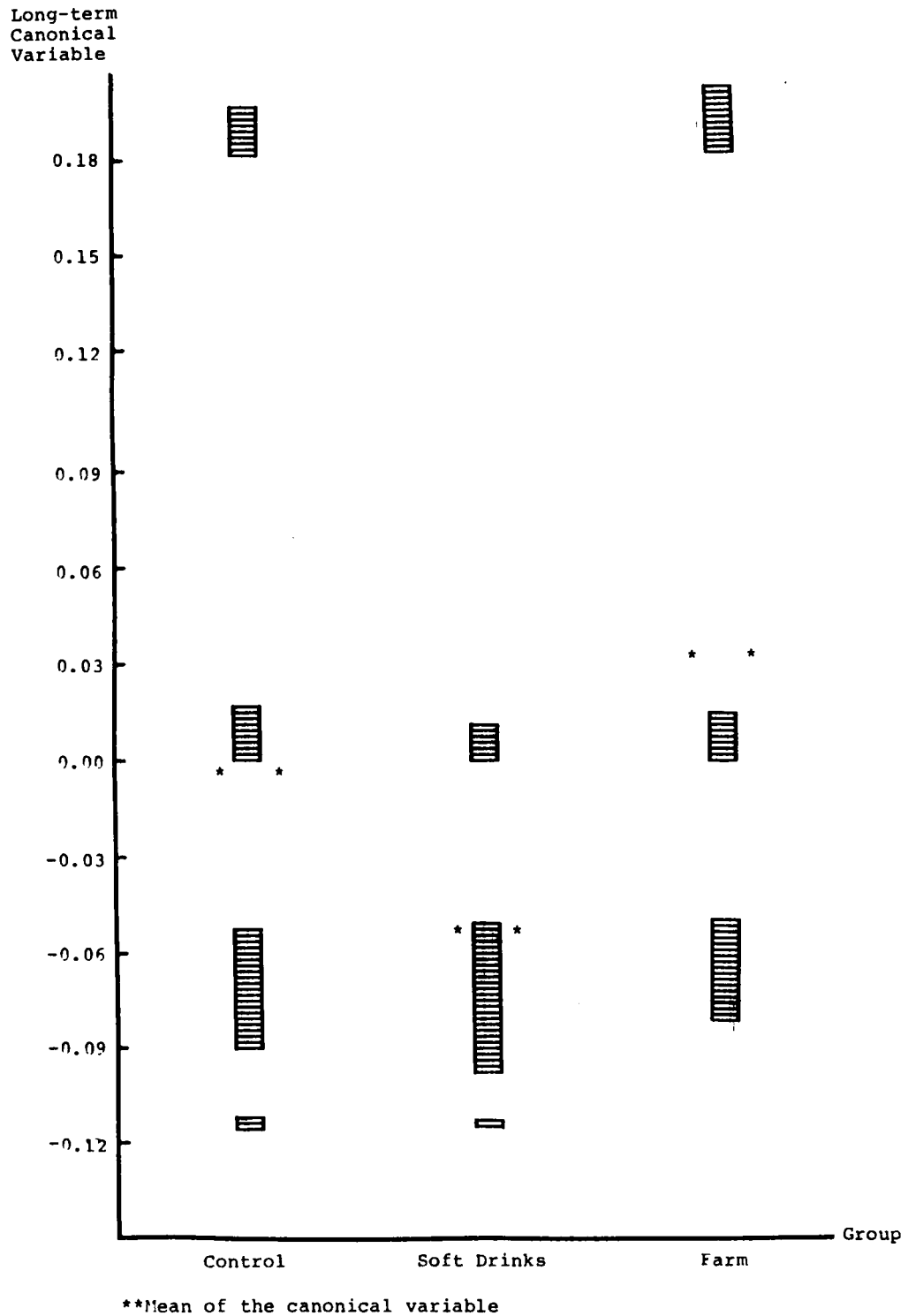


FIGURE 3

Plot of Long-term Canonical Variable by Group

other groups; the farm group displayed the least consensus. Tests for differences in variance will be discussed in the next section.

The short-term canonical variable explains 93 percent of the variation between means. A negative correlation of .36 exists between the canonical variable and the no loan variable. Theoretically, amount should be positively (negatively) correlated with the canonical variable if the correlation between the canonical variable and rate is negative (positive). However, a positive correlation of .84 exists between the canonical variable and amount while a positive correlation of .36 exists between the canonical variable and rate. But, the experimental manipulation did not have a significant impact on the rate variable; therefore, rate is not an important factor in explaining the behavior of the short-term canonical variable.

In Figure 1, canonical variable values of greater than 1.2 represent favorable loans while lower values represent unfavorable loans. Recall that the MANOVA results indicated that the farm group made significantly different decisions from the other groups while univariate statistics indicated that this was a function of the no loan and amount variables. Therefore, these two variables in essence explain the behavior of the canonical variable.

Seven of the loan officers made unfavorable short-term loan decisions. Three loan officers chose not to grant a loan. Two of the no loan decisions were made by the farm group and one was made by the control group. These decisions to grant no loan are represented by 1.147 (the no loan coefficient). All four decisions to loan less than the requested amount were made by the farm group and are represented by the remaining low values for the canonical variable. These low values are the result of the positive amount coefficient being multiplied by a smaller number. Figure 1 clearly illustrates that the farm group made more unfavorable loan decisions than the other groups.

A graph of the intermediate-term canonical variable plotted by group is presented in Figure 2. Recall that for the intermediate-term decision the null of no effect could not be rejected. From the graph, the group means do not appear to be significantly different. All three groups appear to have exhibited similar variance in their decisions. The canonical variable for intermediate-term loan will not be discussed since significant differences between groups were not found, and only 65 percent of the variance was explained by the intermediate-term canonical variable.

Figure 3, a graph of the long-term canonical variable by group, shows that the soft drinks group's decisions were different from the other group's decisions. Once again, the

soft drinks group appears to have displayed more consensus in their loan decisions than the other groups.

The behavior of the long-term canonical variable will now be discussed. Ninety-nine percent of the variance between means is explained by this variable. As expected, a positive correlation (.74) exists between amount loaned and the canonical variable while a negative correlation (-.86) exists between rate charged and the variable. A positive correlation of .94 exists between the no loan variable and the long-term canonical variable. Therefore, the no loan variable explains much of the behavior of the canonical variable.

Recall that the MANOVA results indicated that the soft drinks group made significantly different decisions for the long-term decision, and univariate statistics revealed that this was a function of the no loan variable. The farm and control groups have several observations loading at .198 which is the coefficient of the no loan variable. All observations represented by values lower than .198 indicate that a loan was made; notice that all of the soft drinks group's observations are at lower values. The mean for the soft drinks group is lower than the other groups indicating that they made more favorable loan decisions.

Summary. In the early stages of the study, several commercial bank loan officers were interviewed to obtain

their opinions on the usefulness of industry segment cash flow data. Those interviewed indicated that they are concerned with which segments of diversified companies are sources of cash and which are users of cash. If this information were available, more accurate estimates of future cash flows could be made based on the industries' performance in recent years. Requests for this type of information have been made in the past by the loan officers interviewed, but the companies refused to provide the information.

Although the current study could not address the usefulness of segment cash flow data (whether decision quality was improved), the findings indicate that loan officers did use the information. The "bad news" that a high-risk industry was the primary source of cash affected the short-term loan decision. Favorable loan decisions based on a strong balance sheet were changed to less favorable decisions based on this type of industry segment cash flow data. Expectations of the loan officers changed which indicates that segment cash flow data are relevant for short-term loan decisions.

For the long-term loan decision, results indicate that the loan officers made conservative estimates of future cash flows in the absence of a segment cash flow statement. Loan officers made more favorable decisions when supplied with

information indicating that a low-risk industry was the primary source of cash. Once again, expectations changed indicating that segment cash flow data are relevant. These results should encourage the voluntary disclosure of segment cash flow data which reveal the "good news" that a stable industry has been the primary cash source in recent years.

Tests for Variance Effects

As previously discussed, empirical research has shown that the disclosure of segment data can result in increased consensus in the decisions of financial-statement users [Ortman, 1975 and Dhaliwal, 1978]. Hypotheses developed in Chapter 3 state that subjects in the soft drinks and farm groups (those with access to disaggregated cash flow data) should display more consensus in their decisions than subjects in the control group (those limited to aggregated cash flow data).

Hypothesis 4:

$$\sigma^2_{\text{SOFT DRINKS}} < \sigma^2_{\text{CONTROL}}$$

Hypothesis 5:

$$\sigma^2_{\text{FARM}} < \sigma^2_{\text{CONTROL}}$$

where σ^2 = variance of the discriminant function variable.

Procedures developed by O'Brien [1981] and Brown and Forsythe [1974] were used to test for equality of cell variances. The canonical variables developed from the MANOVA discriminant functions were used to represent the three loan decisions. Results of the tests are presented in Tables 12 and 13. One-tailed tests were used for hypothesis 4 since all effects were in the hypothesized direction. Since the farm group exhibited more variance than the control group for all three decisions while less was expected, the null of no effect cannot be rejected for hypothesis 5.

For the short-term and long-term decisions, the null of equal variances is rejected for hypothesis 4. The soft drinks group exhibited less variance in their decisions than the control group did. (For an illustration of the consensus exhibited in the soft drinks group's decisions, refer to Figure 1 on page 81 and Figure 3 on page 83.) This is consistent with other studies in accounting. Financial-statement users with access to disaggregated data tend to display more consensus in decision making than those limited to aggregated data. The null of equal variance could not be rejected for the intermediate-term decision using the O'Brien procedure. However, Brown and Forsythe's procedure indicates that the soft drinks group also displayed more consensus in their intermediate-term loan decisions.

TABLE 12

Standard Deviation of the Canonical Variables by Group

	Control	Soft Drinks	Farm
Short-term Decision	.065	.042	.143
Intermediate-term Decision	.093	.074	.110
Long-term Decision	.109	.033	.121

TABLE 13

Canonical Variables--Ho: Variances Are Equal

	Control vs Soft Drinks	
	F	p
Short-term Decision		
O'Brien	9.96	.0001*
Brown and Forsythe	2.24	.01*
Intermediate-term Decision		
O'Brien	1.09	.40
Brown and Forsythe	1.60	.08*
Long-term Decision		
O'Brien	100.53	.0001*
Brown and Forsythe	15.08	.0001*

*Significant at .10 level

Importance of Financial Statement Items

The data were also analyzed to determine if the term of a loan influenced the importance loan officers placed on selected financial statement items. In the questionnaire, loan officers were asked to indicate on a five-point scale the importance they placed on each of the following items for each of their three decisions: the balance sheet, the income statement, cash flow data, and industry segment data.

Before reviewing financial statements, a major item loan officers consider is the type of loan request [O'Malia, 1982]. This includes asking how long the money will be needed. Short-term loans are primarily repaid through asset conversion. An example of asset conversion is the sale of inventory for cash. Longer-term loans are repaid mainly by cash generated by operations.

Whether to grant an asset conversion loan is based largely on a company's equity to debt ratio [O'Malia, 1982]. Therefore, the analysis is balance sheet oriented. In responding to the question concerning the importance of the balance sheet for each decision type, the loan officers should have assigned more importance to the balance sheet for the short-term decision than for the intermediate-term and long-term decisions.

Hypothesis 6: The importance assigned to the balance sheet for the short-term decision will be greater than

the importance assigned to the balance sheet for longer term loans.

Forecasts of future profitability are based primarily on income statement and cash flow data. In their questionnaire responses, loan officers should have assigned more importance to the income statement and to cash flow data for the intermediate-term and long-term loans than for the short-term loan.

Hypothesis 7: The importance assigned to the income statement for the intermediate-term and long-term decisions will be greater than the importance assigned to the income statement for the short-term loan.

Hypothesis 8: The importance assigned to cash flow data for the intermediate-term and long-term decisions will be greater than the importance assigned to cash flow data for the short-term loan.

Table 14 contains the means for each item by term of loan (short-term, intermediate-term, and long-term); Table 15 presents the means by group. As expected, the means indicate that the importance assigned to the various financial statement items depended on the term of the loan. The within group effect of term of loan on the significance the loan officers assigned to each financial statement item was examined. Within-group analyses were used because only the control group made their decisions using financial

TABLE 14

Means--Importance of Financial Statement Items

	Short Term	Intermediate Term	Long Term
Balance Sheet	4.49	4.03	4.06
Income Statement	3.89	4.26	4.35
Cash Flow Data	3.78	4.41	4.53
Segment Data	3.41	3.88	4.26

TABLE 15

Means--Importance of Financial Statement Items By Group

	Short Term	Intermediate Term	Long Term
Balance Sheet			
Control	4.47	4.10	4.15
Soft Drinks	4.47	3.97	4.06
Farm	4.53	4.00	3.98
Income Statement			
Control	3.87	4.30	4.51
Soft Drinks	3.97	4.25	4.25
Farm	3.85	4.22	4.30
Cash Flow			
Control	3.97	4.58	4.69
Soft Drinks	3.75	4.26	4.33
Farm	3.63	4.40	4.54
Segment Data			
Control	3.51	3.98	4.46
Soft Drinks	3.47	3.83	3.94
Farm	3.27	3.83	4.34

statements prepared according to GAAP. One-tailed tests were used for the short-term versus intermediate-term and short-term vs long-term tests of all items except industry segment data. Since no a priori statements were made concerning segment data, one-tailed tests were not appropriate; therefore, two-tailed tests were used. All conclusions are based on an alpha level of .10. In Table 16, the results of these tests are presented by group.

Balance sheet information was more important for the short-term decisions for each of the three groups. As expected, there were no significant differences in the importance placed on the balance sheet within any of the three groups for the intermediate-term and long-term decisions.

As hypothesized, the income statement was more important for longer-term loans than for short-term loans for all three groups. The only significant difference between the intermediate-term and long-term decisions was for the farm group.

For cash flow data, results are primarily as expected. For all three groups, significantly more emphasis was placed on cash flow information for the intermediate-term and long-term decisions than for short-term decisions. Results for the farm group also indicate a significant difference between the intermediate-term and long-term decisions.

TABLE 16

Tests for Significant Differences in the Importance
Assigned to Selected Financial Statement Items
for Short-term, Intermediate-term, and
Long-term Loan Decisions by Group

	F	p
Balance Sheet		
ST vs IT (1T)		
Control	7.90	.003*
Soft Drinks	7.39	.004*
Farm	7.70	.003*
ST vs LT (1T)		
Control	4.43	.019*
Soft Drinks	4.55	.018*
Farm	7.14	.005*
IT vs LT (2T)		
Control	.29	.589
Soft Drinks	.32	.574
Farm	.07	.787
Income Statement		
ST vs IT (1T)		
Control	9.93	.001*
Soft Drinks	3.17	.039*
Farm	2.42	.062*
ST vs LT (1T)		
Control	18.08	.000*
Soft Drinks	2.75	.050*
Farm	8.44	.002*
IT vs LT (2T)		
Control	1.89	.172
Soft Drinks	.08	.775
Farm	4.83	.030*

TABLE 16 (continued)

Cash Flow Data

ST vs IT (1T)

Control	11.08	.001*
Soft Drinks	7.83	.003*
Farm	11.94	.001*

ST vs LT (1T)

Control	17.28	.000*
Soft Drinks	11.46	.001*
Farm	25.18	.000*

IT vs LT (2T)

Control	.60	.442
Soft Drinks	.29	.593
Farm	4.23	.042*

Segment Data

ST vs IT (2T)

Control	8.68	.004*
Soft Drinks	7.24	.008*
Farm	8.46	.004*

ST vs LT (2T)

Control	23.32	.000*
Soft Drinks	10.34	.002*
Farm	28.21	.000*

IT vs LT (2T)

Control	12.80	.001*
Soft Drinks	1.73	.192
Farm	19.53	.000*

*Significant at .10 level

1T: one-tailed test

2T: two-tailed test

More emphasis was placed on industry segment information as the term of the loan increased; all differences were significant with one exception. The soft drinks group did not place significantly different emphasis on segment data for their long-term decisions than they did for their intermediate-term decisions.

Summary. The above results provide empirical evidence of arguments frequently stated in the accounting and finance literature. Short-term loan decisions are based primarily on balance sheet data. More emphasis is placed on the income statement and on cash flow information for intermediate-term and long-term loan decisions. The study also reveals that industry segment data become more influential in the lending decision as the term of the loan increases.

Summary

In this chapter, the results of detailed analyses of the data have been presented. These results indicate that commercial bank loan officers perceive industry segment cash flow data to be relevant and would use these data in their lending decisions if the information were available. Apparently, commercial bank loan officers do not perceive information on operating profit, depreciation and amortization expense, and capital expenditures to be adequate estimates of segment cash flow. A complete segment cash flow

statement contains additional relevant information. Table 17 provides a summary of the main findings of the study. Chapter 5 will review the main findings of the study, present conclusions based on the results, and discuss recommendations for future research.

TABLE 17

Summary of Main Results

Hypothesis 1 Segment cash flow data providing the "good news" that a stable industry has been the sole source of cash should result in more favorable loan decisions; therefore, the soft drinks group should have made more favorable loan decisions than the control group.

Results:

Short-term Null of no effect could not be rejected.

Intermediate-term Null of no effect could not be rejected.

Long-term The soft drinks group granted more loans than the control group.

Hypothesis 2 Segment cash flow data providing the "bad news" that an industry currently in serious trouble has been the sole source of cash should result in less favorable loan decisions; therefore, the farm group should have made less favorable loan decisions than the control group.

Results:

Short-term The farm group loaned less money than the control group when a loan was granted.

Intermediate-term Null of no effect could not be rejected.

Long-term Null of no effect could not be rejected.

TABLE 17 (continued)

Hypothesis 3 Loan officers receiving segment cash flow data revealing the "good news" that a stable industry has been the sole source of cash should have made more favorable loan decisions than those receiving segment cash flow data revealing the "bad news" that an industry in serious trouble had been the sole source of cash. Therefore, the soft drinks group should have made more favorable loan decisions than the farm group.

Results:

Short-term The soft drinks group granted more loans and loaned more money when a loan was granted.

Intermediate-term Null of no effect could not be rejected.

Long-term The soft drinks group granted more loans.

Hypotheses 4 and 5 Prior studies have shown that decision makers with access to segment data display more consensus in their decisions; therefore, loan officers with access to segment cash flow data (the soft drinks and farm groups) should display more consensus (less variance) in their decisions than those without access to the segment data (the control group).

Results:

The soft drinks group displayed more consensus in their lending decisions than the control group did for the short-term and long-term decisions. The null of equal variance could not be rejected for the intermediate-term decision.

The farm group exhibited less consensus in their lending decisions than the control group did for all three decisions. Therefore, the null of equal variance could not be rejected.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This chapter discusses the study's conclusions. The objective of the study, the methodology used, and the primary findings are reviewed. Finally, recommendations for future studies are presented.

Main Conclusions

Based on the study's results, a segment cash flow statement contains relevant information for the lending decision. For the short-term and long-term loan decisions, availability of a segment cash flow statement influenced the average decisions made by the loan officers and/or affected decision consensus. Based on information obtained during interviews with commercial bank loan officers and the results of the study, loan officers currently want access to segment cash flow data and would include the information in their decision models if it were available.

To meet the needs of this primary user group, accounting policy makers need to address the issue of expanding financial reporting requirements for diversified companies to include a segment cash flow statement. However, more research is needed to assist policy makers in addressing

this issue. Recommendations for future research are discussed later in this chapter. First, the study and results of the study are reviewed.

Review of Purpose, Methodology, and Primary Findings

Purpose and Methodology. The primary objective of the study was to determine whether a segment cash flow statement would have an impact on the lending decision. To determine this, 167 commercial bank loan officers representing 90 of the nation's 300 largest commercial banks were randomly assigned to three experimental groups and mailed case studies differing in the type of segment cash flow data supplied and an experimental questionnaire. Based on the case study, each subject was asked to make three independent loan decisions; these were a short-term loan, an intermediate-term loan, and a long-term loan decision. Completed questionnaires were returned by 117 loan officers representing 78 banks.

MANOVA was used to determine if the independent variable, the type of segment cash flow data supplied, had an effect on the loan decisions. The dependent variables were a dummy variable indicating whether or not a loan was granted (no loan), the amount loaned, and the interest rate charged.

There were three levels of the independent variable. Subjects assigned to the control group received only the segment cash flow disclosures currently required by GAAP. Members of the tests groups, soft drinks and farm, received a complete segment cash flow statement. The soft drinks group's segment cash flow statement indicated that a stable industry had been the cash source for the past three years while the farm group's statement indicated that an industry in serious trouble had been the source of cash.

Hypotheses were developed to test for significant differences in means between the three groups. According to these hypotheses, the soft drinks group would make more favorable loan decisions than the control group, the farm group would make less favorable loan decisions than the control group, and the soft drinks group would make more favorable loan decisions than the farm group.

Statistical analyses were also conducted to test for variance effects. Hypotheses stated that the test groups would display more consensus (less variance) in their decisions than the control group. The results of these tests and of the MANOVAs are now discussed.

Primary Findings. Analysis of the data revealed that segment cash flow information did affect the loan decisions of commercial bank loan officers. Decision consensus was also influenced by the type of segment cash flow data available.

For the short-term lending decision, loan officers who received a segment cash flow statement revealing that an industry in serious trouble, farm machinery and equipment, had been the sole source of cash made less favorable loan decisions than the control group which did not receive a segment cash flow statement. The farm group loaned less money than the control group when a loan was granted.

The farm group's short-term loan decisions were also less favorable than those made by the group which received a segment cash flow statement indicating that a stable industry, soft drinks, was the sole source of cash. The farm group granted less loans and loaned less money than the soft drinks group when a loan was granted.

When the decision was an intermediate-term loan, the null of no effect could not be rejected. There is no strong evidence that the three groups made significantly different decisions based on the type of segment cash flow data.

For the long-term loan decision, subjects receiving a segment cash flow statement containing the information that the soft drinks industry was the sole source of cash made more favorable loan decisions than those in the control group. The soft drinks group granted more loans than the control group.

The soft drinks group also made more favorable long-term loan decisions than the farm group. Once again, the soft drinks group granted more loans.

Availability of segment cash flow data also affected decision consensus. For the short-term and long-term decisions, the soft drinks group displayed more consensus (less variance) in their decisions than the control group. The farm group exhibited less consensus (more variance) than the control group for all three decisions; therefore, the null of no effect could not be rejected.

Recommendations for Future Research

Studies need to be conducted where user groups other than commercial bank loan officers serve as the subjects. Financial reporting is to provide general purpose financial statements which address the needs of several user groups. Before reporting requirements are expanded, empirical research is needed which addresses the usefulness of a segment cash flow statement for as many user groups as possible. Other studies should address the needs of financial analysts, governmental agencies, stockholders, and other user groups.

The utility of segment cash flow data also needs to be addressed. Results of this study indicate that commercial bank loan officers used the information contained in a segment cash flow statement when one was available. However, no conclusions can be made concerning whether or not decision quality was improved. Studies examining whether

segment cash flow data improve the accuracy of predictions made by financial statement users are needed. For example, studies could address whether or not access to a segment cash flow statement improves earnings predictions or bankruptcy predictions.

Before studies addressing the utility of segment cash flow data can be conducted, access to this data for real companies must be obtained. If researchers cannot find companies who will voluntarily supply these data, this type of research cannot be conducted unless disclosure is required by GAAP.

Research is also needed to determine if disclosure of a segment cash flow statement would be practical. A survey of high level financial managers of diversified companies could help determine whether or not they currently prepare segment cash flow statements. If they do not, information could be obtained concerning the difficulty involved in preparing a segment cash flow statement and the costs involved.

The results of the present study when combined with the results of studies like those discussed in this section should provide the FASB with the evidence necessary to determine whether segment reporting should be expanded to include a cash flow statement. Based on the results of this study, a segment cash flow statement is perceived by commercial bank loan officers to contain information useful in making short-term and long-term loan decisions.

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APPENDIXES

APPENDIX A

April 29, 1986

Dear Mr. XXXXXX:

Should financial reporting for diversified companies be modified to more meaningfully reflect underlying economic activities in different industries? Because more companies are becoming diversified, the needs of commercial bank loan officers in this area should be determined.

As part of my doctoral dissertation at the University of Tennessee, I plan to examine the effects of various types of accounting information on loan officers' evaluations of the credit worthiness of diversified corporations. Based on a review of the banking literature and interviews with commercial bank loan officers, I am confident that my study will reveal specific ways in which reporting for diversified companies can better address the needs of loan officers. Your cooperation is essential to the success of this research project.

Enclosed is a response form that I ask you to return to me indicating whether or not your bank will participate in the study. If your response is yes, as I hope it will be, please supply the name(s) of one or more commercial bank loan officer(s) who are experienced in financial statement analysis and have the authority to make loans, or participate in the decision to make loans, in the five to ten million dollar range. If you wish to participate in the study, include your name on the list. All names you supply will be held in strict confidence and will only be used by me.

I will mail a questionnaire to the loan officer(s) you recommend. The questionnaire has been pretested and requires about 20 minutes to complete. All questionnaire responses will be held in strict confidence and will be used only to develop statistical tables.

If you wish, I will be happy to send you a summary of the results of the study. Space has been provided on the response form for you to request such a summary.

When you complete the response form, please return it to me in the enclosed self-addressed, postage-paid envelope. The number on the response form is for follow-up purposes only.

Your cooperation is vital to the success of this project and will be greatly appreciated.

Sincerely,

Donna Street
Ph.D. Student

RESPONSE FORM

Please complete this form as described in the letter from Donna Street dated July 5, 1986.

My bank will participate in the study. Yes _____ No _____

Send a questionnaire to the following person or persons:

Name _____

Name _____

Address _____

Address _____

Phone _____

Phone _____

Name _____

Name _____

Address _____

Address _____

Phone _____

Phone _____

Do you wish to have a copy of the results
of the study mailed to you?

Yes _____ No _____

Thank you very much.

May 30, 1986

Dear Mr. Xxxxx:

Should financial reporting for diversified companies be modified to more meaningfully reflect underlying economic activities in different industries? I am writing, as I did on April 29, 1986, to again request your bank's participation in a study to answer this important question. Because more companies are becoming diversified, the needs of commercial bank loan officers in this area should be determined.

As part of my doctoral dissertation at the University of Tennessee, I plan to examine the effects of various types of accounting information on loan officers' evaluations of the credit worthiness of diversified corporations. Based on a review of the banking literature and interviews with commercial bank loan officers, I am confident that my study will reveal specific ways in which reporting for diversified companies can better address the needs of loan officers. Your cooperation is essential to the success of this research project.

Enclosed is a response form that I ask you to return to me indicating whether or not your bank will participate in the study. If your response is yes, as I hope it will be, please supply the name(s) of one or more commercial bank loan officer(s) who are experienced in financial statement analysis and have the authority to make loans, or participate in the decision to make loans, in the five to ten million dollar range. If you wish to participate in the study, include your name on the list. All names you supply will be held in strict confidence and will only be used by me.

I will mail a questionnaire to the loan officer(s) you recommend. The questionnaire has been pretested and requires about 20 minutes to complete. All questionnaire responses will be held in strict confidence and will be used only to develop statistical tables.

If you wish, I will be happy to send you a summary of the results of the study. Space has been provided on the response form for you to request such a summary.

When you complete the response form, please return it to me in the enclosed self-addressed, postage-paid envelope. The number on the response form is for follow-up purposes only.

Your cooperation is vital to the success of this project and will be greatly appreciated.

Sincerely,

Donna Street
Ph.D. Student

May 20, 1986

Dear Mr. xxxxxxx:

Should financial reporting for diversified companies be modified to more meaningfully reflect underlying economic activities in different industries? Because more companies are becoming diversified, the needs of commercial bank loan officers in this area should be determined.

As part of my doctoral dissertation at the University of Tennessee, I plan to examine the effects of various types of accounting information on loan officers' evaluations of the credit worthiness of diversified corporations. Based on a review of the banking literature and interviews with commercial bank loan officers, I am confident that my study will reveal specific ways in which reporting for diversified companies can better address the needs of loan officers. Xxxxxx Xxxxxxx has indicated an interest in your bank's participation in this project and recommended you as the appropriate person to represent Xxxxx Bank. Your cooperation is essential to the success of this research project.

Please read the enclosed case. Then complete the questionnaire on page five and return it to me in the self-addressed, postage-paid envelope. Alternatively, you may telephone me with your response Monday through Friday at (615)xxx-xxxx between 11am and 8pm (ET). The questionnaire has been pretested and requires around 20 minutes to complete.

The number on the questionnaire is for follow up purposes only. Your individual responses will be held in strict confidence and will be used only to develop statistical tables.

If you wish, I will be happy to mail you a summary of the results. Space has been provided at the end of the questionnaire for you to request such a summary.

Your cooperation is vital to the success of this project and will be greatly appreciated.

Sincerely,

Donna Street
Ph.D. Student

August 15, 1986

Dear Mr. XXXXXXXX:

Should financial reporting for diversified companies be modified to more meaningfully reflect underlying economic activities in different industries? I am writing, as I did on July 22, 1986, to again request your participation in a study to answer this important question. Because more companies are becoming diversified, the needs of commercial bank loan officers in this area should be determined. If you have already responded, please ignore this request.

As part of my doctoral dissertation at the University of Tennessee, I plan to examine the effects of various types of accounting information on loan officers' evaluations of the credit worthiness of diversified corporations. Based on a review of the banking literature and interviews with commercial bank loan officers, I am confident that my study will reveal specific ways in which reporting for diversified companies can better address the needs of loan officers. XXXXX XXXXXXXX has indicated an interest in your bank's participation in this project and recommended you as the appropriate person to represent XXXXXXXX Bank. Your cooperation is essential to the success of this research project.

Please read the enclosed case. Then complete the questionnaire on page five and return it to me in the enclosed self-addressed, postage-paid envelope. The questionnaire has been pretested and requires around 20 minutes to complete.

The number on the questionnaire is for follow up purposes only. Your individual responses will be held in strict confidence and will be used only to develop statistical tables.

If you wish, I will be happy to mail you a summary of the results. Space has been provided at the end of the questionnaire for you to request such a summary.

Your cooperation is vital to the success of this project and will be greatly appreciated.

Sincerely,

Donna Street
Ph.D. Student

July 21, 1986

Dear Ms. Xxxxx:

Thank you for agreeing to participate in my research project concerning ways in which reporting for diversified companies can be modified to better address the needs of commercial bank loan officers. I have enclosed a copy of the questionnaire for you and mailed one to each of the other loan officers that you recommended at NBC Bank.

Please read the enclosed case. Then complete the questionnaire on page five and return it to me in the self-addressed, postage-paid envelope. Alternatively, you may telephone me with your response Monday through Friday at (615)xxx-xxxx between 11am and 8pm (ET). The questionnaire has been pretested and requires around 20 minutes to complete.

The number on the questionnaire is for follow up purposes only. Your individual responses will be held in strict confidence and will be used only to develop statistical tables.

If you wish, I will be happy to mail you a summary of the results. Space has been provided at the end of the questionnaire for you to request such a summary.

Your cooperation is vital to the success of this project and will be greatly appreciated.

Sincerely,

Donna Street
Ph.D. Student

QUESTIONNAIRE--THE CONTROL GROUP

INTRODUCTION

Madison, Inc. has applied to your bank for a commercial loan. Based on the following financial information and brief description of Madison's operations and management, you are asked on page five to make preliminary recommendations concerning the amount of credit, that in your opinion, your bank would most likely be willing to extend to Madison and the interest rate to be charged under the specified terms.

Company and management description:

Madison operates in two industry segments: 1) farm machinery and equipment and 2) soft drinks. In 1969, Madison began to manufacture farm machinery and equipment. Currently, the farm machinery and equipment segment produces and markets farm machinery and equipment, including equipment and wheel tractors.

In 1977, Madison purchased a manufacturer of soft drinks. The segment produces bottled and canned soft drinks, including cola, diet cola, grape soda, and orange soda. The segment markets its products through food brokers.

Current management has been with Madison since it was incorporated in 1969 with the exception of members added in 1977 to oversee the soft drink division. All members of top management were recruited from companies in the farm machinery and equipment or soft drink industries. Management is highly respected in the business community.

Assume the following:

1. There are no legal restrictions on Madison which would prevent it from borrowing from your bank.
2. A compensating balance of 10% of the loan is to remain on deposit at your institution.
3. Madison is a new customer that could eventually establish a long term relationship with your bank.
4. The following statements have been audited by a reputable accounting firm and received an unqualified opinion.

Note: For your convenience, financial ratios have been computed and follow the financial statements on page 3.

Please continue on page 2

Madison Inc.
Income Statement
For the Years Ended March 31
(in thousands except for per share data)

	1986	1985	1984
Sales	\$85,250	\$83,850	\$85,130
Cost of Goods Sold	57,012	54,986	56,203
Gross Profit	28,238	28,864	28,927
Operating Expenses	21,895	21,935	21,599
Operating Income	6,343	6,929	7,328
Interest Expense	3,693	4,304	4,501
Income Before Taxes	2,650	2,625	2,827
Income Taxes	725	699	707
Net Income	\$ 1,925	\$ 1,926	\$ 2,120
Earnings per share	\$.77	\$.77	\$.85

Madison Inc.
Balance Sheet
March 31
(in thousands)

	1986	1985	1984
Cash	\$ 4,558	\$ 4,498	\$ 4,428
Accounts and Notes Receivable (Net of Allowance for Doubtful Accounts: 160 in 1986, 158 in 1985, and 157 in 1984)	10,160	10,120	10,118
Inventories, at cost-LIFO (Last In First Out) basis.	14,515	14,400	14,375
Other Current Assets	684	654	645
Total Current Assets	29,917	29,672	29,566
Property, Plant, and Equipment	25,077	23,776	22,583
Intangible Assets	2,117	2,088	2,037
Other Noncurrent Assets	4,538	4,485	4,327
Total Assets	\$61,649	\$60,021	\$58,513
Notes Payable	\$ 4,518	\$ 4,511	\$ 4,510
Current Maturities on Long Term Debt	1,930	1,915	1,910
Accounts Payable (Trade)	5,977	5,975	5,973
Accrued Expenses	3,562	3,552	3,550
Other Current Liabilities	2,598	2,588	2,590
Total Current Liabilities	18,585	18,541	18,533
Long Term Debt	10,408	10,619	10,924
Other Noncurrent Liabilities	2,271	2,249	2,220
Total Stockholder's Equity	30,385	28,612	26,836
Total Liabilities and Stockholder's Equity	\$61,649	\$60,021	\$58,513

Stockholder's Equity
(in thousands)

	1986	1985	1984
Paid in Capital	18,000	18,000	18,000
Retained Earnings	12,385	10,612	8,836
Total Stockholder's Equity	30,385	28,612	26,836

Please continue on page 3

Madison Inc.
Statement of Changes in Financial Position
For the Years Ended March 31
(in thousands)

<u>Sources of Cash</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>
<u>Operations</u>			
Net income	\$1,925	\$1,926	\$2,120
Accrual to cash adjustments			
Depreciation and amortization	2,656	2,719	2,468
Deferred income taxes	22	29	90
Change in noncash working capital accounts	(141)	(28)	(40)
Cash provided by operations	<u>4,462</u>	<u>4,646</u>	<u>4,638</u>
<u>Uses of Cash</u>			
Acquisition of plant assets	3,901	3,893	3,860
Purchase of patents and other intangible assets	85	70	310
Increase in noncurrent receivables	53	158	105
Payment of cash dividends	152	150	148
Payment of long term debt	<u>211</u>	<u>305</u>	<u>150</u>
Total uses of cash	<u>4,402</u>	<u>4,576</u>	<u>4,573</u>
Increase in cash	\$60	\$70	\$65

SELECTED FINANCIAL RATIOS

	<u>1986</u>	<u>1985</u>	<u>1984</u>
Current Ratio	1.61	1.60	1.59
Quick Ratio	.83	.82	.82
Cost of Sales/Inventory	3.93	3.82	3.91
Sales/Working Capital	7.52	7.53	7.71
Fixed Assets/Net Worth	.82	.83	.84
Total Liabilities/Net Worth	1.03	1.10	1.18
Current Liabilities/Net Worth	.61	.65	.69
Sales/Total Assets	1.38	1.40	1.45

Please continue on page 4

Industry Segment Information
(in thousands)

Sales-	<u>1986</u>	<u>1985</u>	<u>1984</u>
Soft Drinks-	\$50,000	\$45,349	\$40,863
Farm Machinery and Equipment-	\$35,250	\$38,501	\$44,267
Operating profit-			
Soft Drinks-	\$3,421	\$3,420	\$3,489
Farm Machinery and Equipment-	\$2,303	\$2,970	\$3,290
Capital expenditures-			
Soft Drinks-	\$2,100	\$2,001	\$1,975
Farm Machinery and Equipment-	\$1,801	\$1,892	\$1,885
Depreciation and amortization-			
Soft Drinks-	\$1,450	\$1,421	\$1,267
Farm Machinery and Equipment-	\$1,206	\$1,298	\$1,201
Identifiable assets-			
Soft Drinks-	\$23,111	\$22,228	\$21,227
Farm Machinery and Equipment-	\$33,538	\$32,875	\$32,136

Please continue on page 5

PART 1

Based on the preceding information, please respond to the following independent questions.

Decision 1. If Madison is applying for a \$1,000,000 six-month loan, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to finance the seasonal purchase of sugar and syrup for the soft drinks division.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

Decision 2. If Madison is applying for a \$3,000,000 loan on a three-year unsecured note, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to purchase equipment for the soft drinks division. The equipment would enable Madison to expand its production of diet and caffeine-free drinks. If the equipment is purchased, Madison's total sales and total operating profit (i.e. income before interest and income taxes) are expected to increase approximately 15%.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

Decision 3. If Madison is applying for an \$8,000,000 seven-year term loan, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to finance expansion of the soft drinks division's plant facilities. The additional capacity would be used to increase the production of soft drinks, especially the increasingly popular diet and caffeine-free products. If the additional capacity is acquired, Madison's total sales and total operating profit (i.e. income before interest and income taxes) are expected to increase approximately 30%.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

PART 2

Please indicate on a five point scale, with 1 indicating the item was not important and 5 indicating the item was extremely important, the importance of the following items in making each of your three independent decisions. Note: you should circle a response on each of the three five-point scales that appear beside each of the five types of information below.

	DECISION 1	DECISION 2	DECISION 3
Balance sheet information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Income statement information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Cash flow information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Industry segment information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

PART 3

Please supply the following information:

How many years of experience do you have in commercial banking? _____

Approximately how many accounting courses have you taken at the college or university level? _____

What is the highest level degree you have earned? _____

What is your age? _____

Do you wish to have a copy of the results mailed to you? _____

Please return your completed questionnaire in the self-addressed, postage-paid envelope.

Thank you very much.

QUESTIONNAIRE--SOFT DRINKS

INTRODUCTION

Madison, Inc. has applied to your bank for a commercial loan. Based on the following financial information and brief description of Madison's operations and management, you are asked on page five to make preliminary recommendations concerning the amount of credit, that in your opinion, your bank would most likely be willing to extend to Madison and the interest rate to be charged under the specified terms.

Company and management description:

Madison operates in two industry segments: 1) farm machinery and equipment and 2) soft drinks. In 1969, Madison began to manufacture farm machinery and equipment. Currently, the farm machinery and equipment segment produces and markets farm machinery and equipment, including equipment and wheel tractors.

In 1977, Madison purchased a manufacturer of soft drinks. The segment produces bottled and canned soft drinks, including cola, diet cola, grape soda, and orange soda. The segment markets its products through food brokers.

Current management has been with Madison since it was incorporated in 1969 with the exception of members added in 1977 to oversee the soft drink division. All members of top management were recruited from companies in the farm machinery and equipment or soft drink industries. Management is highly respected in the business community.

Assume the following:

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Interest Expense	3,693	4,304	4,501
Income Before Taxes	2,650	2,625	2,827
Income Taxes	725	699	707
Net Income	\$ 1,925	\$ 1,926	\$ 2,120
Earnings per share	\$.77	\$.77	\$.85

Madison Inc.
Balance Sheet
March 31
(in thousands)

	1986	1985	1984
Cash	\$ 4,558	\$ 4,498	\$ 4,428
Accounts and Notes Receivable (Net of Allowance for Doubtful Accounts: 160 in 1986, 158 in 1985, and 157 in 1984)	10,160	10,120	10,118
Inventories, at cost-LIFO (Last In First Out) basis.	14,515	14,400	14,375
Other Current Assets	684	654	645
Total Current Assets	29,917	29,672	29,566
Property, Plant, and Equipment	25,077	23,776	22,583
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Total Assets	\$61,649	\$60,021	\$58,513
Notes Payable	\$ 4,518	\$ 4,511	\$ 4,510
Current Maturities on Long Term Debt	1,930	1,915	1,910
Accounts Payable (Trade)	5,977	5,975	5,973
Accrued Expenses	3,562	3,552	3,550
Other Current Liabilities	2,598	2,588	2,590
Total Current Liabilities	18,585	18,541	18,533
Long Term Debt	10,408	10,619	10,924
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(in thousands)

	1986	1985	1984
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Please continue on page 3

Madison Inc.
Statement of Changes in Financial Position
For the Years Ended March 31
(in thousands)

<u>Sources of Cash</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>
<u>Operations</u>			
Net income	\$1,925	\$1,926	\$2,120
Accrual to cash adjustments			
Depreciation and amortization	2,656	2,719	2,468
Deferred income taxes	22	29	90
Change in noncash working capital accounts	(141)	(28)	(40)
Cash provided by operations	4,462	4,646	4,638
<u>Uses of Cash</u>			
Acquisition of plant assets	3,901	3,893	3,860
Purchase of patents and other intangible assets	85	70	310
Increase in noncurrent receivables	53	158	105
Payment of cash dividends	152	150	148
Payment of long term debt	211	305	150
Total uses of cash	4,402	4,576	4,573
Increase in cash	\$60	\$70	\$65

SELECTED FINANCIAL RATIOS

	<u>1986</u>	<u>1985</u>	<u>1984</u>
Current Ratio	1.61	1.60	1.59
Quick Ratio	.83	.82	.82
Cost of Sales/Inventory	3.93	3.82	3.91
Sales/Working Capital	7.52	7.53	7.71
Fixed Assets/Net Worth	.82	.83	.84
Total Liabilities/Net Worth	1.03	1.10	1.18
Current Liabilities/Net Worth	.61	.65	.69
Sales/Total Assets	1.38	1.40	1.45

Please continue on page 4

INDUSTRY SEGMENT INFORMATION
(in thousands)

Sales-	1986	1985	1984
Soft Drinks-	\$50,000	\$45,349	\$40,863
Farm Machinery and Equipment-	\$35,250	\$38,501	\$44,267
Identifiable assets-			
Soft Drinks-	\$23,111	\$22,228	\$21,227
Farm Machinery and Equipment-	\$33,538	\$32,875	\$32,136

Madison Inc.
Segment Statement of Changes in Financial Position
For the Years Ended March 31
(in thousands)

	1986		1985		1984	
	Soft Drinks	Farm Mach	Soft Drinks	Farm Mach	Soft Drinks	Farm Mach
<u>Sources of Cash</u>						
Operations						
Operating profit	\$3,421	\$2,303	\$3,420	\$2,970	\$3,489	\$3,290
Less: interest & taxes	<u>1,527</u>	<u>2,166</u>	<u>1,484</u>	<u>2,820</u>	<u>1,576</u>	<u>2,925</u>
Contribution to corporate expense & net income	1,894	137	1,936	150	1,913	365
Accrual to cash adjustments						
Depreciation and amortization	1,450	1,206	1,421	1,298	1,267	1,201
Deferred taxes	12	10	19	10	60	30
Change in noncash working capital accounts	<u>(8)</u>	<u>(133)</u>	<u>10</u>	<u>(38)</u>	<u>(60)</u>	<u>20</u>
Cash provided by operations	3,348	1,220	3,386	1,420	3,180	1,616
<u>Uses of cash</u>						
Acquisition of plant assets	2,100	1,801	2,001	1,892	1,975	1,885
Purchase of patents and other assets	25	60	50	20	150	160
Increase in noncurrent receivables	30	23	30	128	55	50
Payment of long term debt	<u>45</u>	<u>166</u>	<u>55</u>	<u>250</u>	<u>50</u>	<u>100</u>
Total uses of cash	2,200	2,050	2,136	2,290	2,230	2,195
Segment cash flow	1,148	(830)	1,250	(870)	950	(579)
Increase in cash before corporate expenses	\$318		\$380		\$371	
Less: Corporate expenses	(106)		(160)		(158)	
Payment of cash dividends	<u>(152)</u>		<u>(150)</u>		<u>(148)</u>	
Increase in cash	\$60		\$70		\$65	

Please continue on page 5

PART 1

Based on the preceding information, please respond to the following independent questions.

Decision 1. If Madison is applying for a \$1,000,000 six-month loan, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to finance the seasonal purchase of sugar and syrup for the soft drinks division.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

Decision 2. If Madison is applying for a \$3,000,000 loan on a three-year unsecured note, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to purchase equipment for the soft drinks division. The equipment would enable Madison to expand its production of diet and caffeine-free drinks. If the equipment is purchased, Madison's total sales and total operating profit (i.e. income before interest and income taxes) are expected to increase approximately 15%.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

Decision 3. If Madison is applying for an \$8,000,000 seven-year term loan, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to finance expansion of the soft drinks division's plant facilities. The additional capacity would be used to increase the production of soft drinks, especially the increasingly popular diet and caffeine-free products. If the additional capacity is acquired, Madison's total sales and total operating profit (i.e. income before interest and income taxes) are expected to increase approximately 30%.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

PART 2

Please indicate on a five point scale, with 1 indicating the item was not important and 5 indicating the item was extremely important, the importance of the following items in making each of your three independent decisions. Note: you should circle a response on each of the three five-point scales that appear beside each of the five types of information below.

	<u>DECISION 1</u>	<u>DECISION 2</u>	<u>DECISION 3</u>
Balance sheet information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
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Cash flow information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Industry segment information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

PART 3

Please supply the following information:

How many years of experience do you have in commercial banking? _____

Approximately how many accounting courses have you taken at the college or university level? _____

What is the highest level degree you have earned? _____

What is your age? _____

Do you wish to have a copy of the results mailed to you? _____

Please return your completed questionnaire in the self-addressed, postage-paid envelope.

Thank you very much.

QUESTIONNAIRE--FARM MACHINERY AND EQUIPMENT

INTRODUCTION

Madison, Inc. has applied to your bank for a commercial loan. Based on the following financial information and brief description of Madison's operations and management, you are asked on page five to make preliminary recommendations concerning the amount of credit, that in your opinion, your bank would most likely be willing to extend to Madison and the interest rate to be charged under the specified terms.

Company and management description:

Madison operates in two industry segments: 1) farm machinery and equipment and 2) soft drinks. In 1969, Madison began to manufacture farm machinery and equipment. Currently, the farm machinery and equipment segment produces and markets farm machinery and equipment, including equipment and wheel tractors.

In 1977, Madison purchased a manufacturer of soft drinks. The segment produces bottled and canned soft drinks, including cola, diet cola, grape soda, and orange soda. The segment markets its products through food brokers.

Current management has been with Madison since it was incorporated in 1969 with the exception of members added in 1977 to oversee the soft drink division. All members of top management were recruited from companies in the farm machinery and equipment or soft drink industries. Management is highly respected in the business community.

Assume the following:

1. There are no legal restrictions on Madison which would prevent it from borrowing from your bank.
2. A compensating balance of 10% of the loan is to remain on deposit at your institution.
3. Madison is a new customer that could eventually establish a long term relationship with your bank.
4. The following statements have been audited by a reputable accounting firm and received an unqualified opinion.

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For the Years Ended March 31
(in thousands except for per share data)

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Operating Expenses	21,895	21,935	21,599
Operating Income	6,343	6,929	7,328
Interest Expense	3,693	4,304	4,501
Income Before Taxes	2,650	2,625	2,827
Income Taxes	725	699	707
Net Income	\$ 1,925	\$ 1,926	\$ 2,120
Earnings per share	\$.77	\$.77	\$.85

Madison Inc.
Balance Sheet
March 31
(in thousands)

	1986	1985	1984
Cash	\$ 4,558	\$ 4,498	\$ 4,428
Accounts and Notes Receivable (Net of Allowance for Doubtful Accounts: 160 in 1986, 158 in 1985, and 157 in 1984)	10,160	10,120	10,118
Inventories, at cost-LIFO (Last In First Out) basis.	14,515	14,400	14,375
Other Current Assets	684	654	645
Total Current Assets	29,917	29,672	29,566
Property, Plant, and Equipment	25,077	23,776	22,583
Intangible Assets	2,117	2,088	2,037
Other Noncurrent Assets	4,538	4,485	4,327
Total Assets	\$61,649	\$60,021	\$58,513
Notes Payable	\$ 4,518	\$ 4,511	\$ 4,510
Current Maturities on Long Term Debt	1,930	1,915	1,910
Accounts Payable (Trade)	5,977	5,975	5,973
Accrued Expenses	3,562	3,552	3,550
Other Current Liabilities	2,598	2,588	2,590
Total Current Liabilities	18,585	18,541	18,533
Long Term Debt	10,408	10,619	10,924
Other Noncurrent Liabilities	2,271	2,249	2,220
Total Stockholder's Equity	30,385	28,612	26,836
Total Liabilities and Stockholder's Equity	\$61,649	\$60,021	\$58,513

Stockholder's Equity
(in thousands)

	1986	1985	1984
Paid in Capital	18,000	18,000	18,000
Retained Earnings	12,385	10,612	8,836
Total Stockholder's Equity	30,385	28,612	26,836

Please continue on page 3

Madison Inc.
Statement of Changes in Financial Position
For the Years Ended March 31
(in thousands)

<u>Sources of Cash</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>
<u>Operations</u>			
Net income	\$1,925	\$1,926	\$2,120
Accrual to cash adjustments			
Depreciation and amortization	2,656	2,719	2,468
Deferred income taxes	22	29	90
Change in noncash working capital accounts	(141)	(28)	(40)
Cash provided by operations	4,462	4,646	4,638
<u>Uses of Cash</u>			
Acquisition of plant assets	3,901	3,893	3,860
Purchase of patents and other intangible assets	85	70	310
Increase in noncurrent receivables	53	158	105
Payment of cash dividends	152	150	148
Payment of long term debt	211	305	150
Total uses of cash	4,402	4,576	4,573
Increase in cash	\$60	\$70	\$65

SELECTED FINANCIAL RATIOS

	<u>1986</u>	<u>1985</u>	<u>1984</u>
Current Ratio	1.61	1.60	1.59
Quick Ratio	.83	.82	.82
Cost of Sales/Inventory	3.93	3.82	3.91
Sales/Working Capital	7.52	7.53	7.71
Fixed Assets/Net Worth	.82	.83	.84
Total Liabilities/Net Worth	1.03	1.10	1.18
Current Liabilities/Net Worth	.61	.65	.69
Sales/Total Assets	1.38	1.40	1.45

Please continue on page 4

INDUSTRY SEGMENT INFORMATION
(in thousands)

	1986	1985	1984
Sales-			
Soft Drinks-	\$50,000	\$45,349	\$40,863
Farm Machinery and Equipment-	\$35,250	\$38,501	\$44,267
Identifiable assets-			
Soft Drinks-	\$23,111	\$22,228	\$21,227
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Madison Inc.
Segment Statement of Changes in Financial Position
For the Years Ended March 31
(in thousands)

	1986		1985		1984	
	Soft Drinks	Farm Mach	Soft Drinks	Farm Mach	Soft Drinks	Farm Mach
<u>Sources of Cash</u>						
Operations						
Operating profit	\$3,421	\$2,303	\$3,420	\$2,970	\$3,489	\$3,290
Less: interest & taxes	<u>2,750</u>	<u>943</u>	<u>2,820</u>	<u>1,484</u>	<u>2,925</u>	<u>1,576</u>
Contribution to corporate expense & net income	671	1,360	600	1,486	564	1,714
Accrual to cash adjustments						
Depreciation and amortization	1,450	1,206	1,421	1,298	1,267	1,201
Deferred taxes	10	12	10	19	30	60
Change in noncash working capital accounts	<u>(133)</u>	<u>(8)</u>	<u>(38)</u>	<u>10</u>	<u>(60)</u>	<u>20</u>
Cash provided by operations	1,998	2,570	1,993	2,813	1,801	2,995
<u>Uses of cash</u>						
Acquisition of plant assets	2,100	1,801	2,001	1,892	1,975	1,885
Purchase of patents and other assets	60	25	20	50	250	60
Increase in noncurrent receivables	30	23	128	30	50	55
Payment of long term debt	<u>166</u>	<u>45</u>	<u>250</u>	<u>55</u>	<u>100</u>	<u>50</u>
Total uses of cash	2,356	1,894	2,399	2,027	2,375	2,050
Segment cash flow	(358)	676	(406)	786	(574)	945
Increase in cash before corporate expenses	\$318		\$380		\$371	
Less: Corporate expenses	(106)		(160)		(158)	
Payment of cash dividends	<u>(152)</u>		<u>(150)</u>		<u>(148)</u>	
Increase in cash	\$60		\$70		\$65	

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PART 1

Based on the preceding information, please respond to the following independent questions.

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Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %

Decision 2. If Madison is applying for a \$3,000,000 loan on a three-year unsecured note, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to purchase equipment for the soft drinks division. The equipment would enable Madison to expand its production of diet and caffeine-free drinks. If the equipment is purchased, Madison's total sales and total operating profit (i.e. income before interest and income taxes) are expected to increase approximately 15%.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

Decision 3. If Madison is applying for an \$8,000,000 seven-year term loan, how much would you be willing to loan, and how much above the appropriate prime rate would you charge? The purpose of the loan is to finance expansion of the soft drinks division's plant facilities. The additional capacity would be used to increase the production of soft drinks, especially the increasingly popular diet and caffeine-free products. If the additional capacity is acquired, Madison's total sales and total operating profit (i.e. income before interest and income taxes) are expected to increase approximately 30%.

Note: You may loan less than the requested amount.

I would loan the following amount: \$ _____.

I would charge the appropriate prime rate plus _____ %.

PART 2

Please indicate on a five point scale, with 1 indicating the item was not important and 5 indicating the item was extremely important, the importance of the following items in making each of your three independent decisions. Note: You should circle a response on each of the three five-point scales that appear beside each of the five types of information below.

	DECISION 1	DECISION 2	DECISION 3
Balance sheet information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Income statement information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Cash flow information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Industry segment information	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

PART 3

Please supply the following information:

How many years of experience do you have in commercial banking? _____

Approximately how many accounting courses have you taken at the college or university level? _____

What is the highest level degree you have earned? _____

What is your age? _____

Do you wish to have a copy of the results mailed to you? _____

Please return your completed questionnaire in the self-addressed, postage-paid envelope.

Thank you very much.

APPENDIX B

ANCOVA (analysis of covariance) was used to determine whether the demographic characteristics of the loan officers influenced their loan decisions. Data on certain demographic characteristics of the subjects were collected in the experimental questionnaire. The results are provided in Table B-1. At a significance level of .10, the results indicate that the demographic characteristics of the subjects did not have a significant impact on their loan decisions.

TABLE B-1

Effect of Demographic Variables on the Lending Decision

	F	p
Years Experience		
Short-term Decision	.14	.70
Intermediate-term Decision	.17	.68
Long-term Decision	.01	.93
Accounting Courses		
Short-term Decision	1.36	.25
Intermediate-term Decision	.31	.58
Long-term Decision	1.09	.30
Degree		
Short-term Decision	.96	.33
Intermediate-term Decision	.97	.33
Long-term Decision	1.62	.21

APPENDIX C

ANCOVA (analysis of covariance) was used to determine whether or not the demographic characteristics of the subjects had an impact on the importance they assigned to various types of financial information. In the questionnaire, data for the following demographic variables were collected for each subject: years of experience in commercial lending, number of accounting courses taken (in semesters), and the highest degree earned. The major significant results were for the variable highest degree earned. Table C-1, which reports the results of the ANCOVA, and Table C-2, which reports means by highest degree earned, indicate that the more educated loan officers assigned significantly less importance to the balance sheet (short-term and long-term loan decisions), the income statement (short-term, intermediate-term, and long-term loan decisions), and industry segment data (short-term and intermediate-term loan decisions) than the less educated loan officers.

TABLE C-1

Effect of Demographics on the Importance Loan Officers
Assigned to Selected Financial Statement Items

	Years of Experience		Accounting Courses Taken		Highest Degree Earned	
	F	p	F	p	F	p
Balance Sheet						
ST	1.04	.44	1.44	.16	2.00	.08*
IT	.92	.58	1.26	.26	1.27	.28
LT	.90	.60	1.21	.29	2.62	.03*
Income Statement						
ST	1.08	.38	.87	.59	2.97	.02*
IT	1.21	.26	1.36	.20	3.33	.01*
LT	1.08	.39	1.66	.09*	2.55	.03*
Cash Flow						
ST	1.07	.40	.74	.72	.39	.85
IT	.86	.66	1.26	.26	.37	.87
LT	.85	.67	1.41	.18	.88	.50
Segment Data						
ST	.47	.98	.64	.81	2.76	.02*
IT	.84	.69	1.27	.25	1.92	.10*
LT	.80	.73	1.07	.40	1.00	.42

*Significant at .10 level

ST: Short-term

IT: Intermediate-term

LT: Long-term

TABLE C-2
Means by Degree

	HS	Some Coll	Coll	Some Grad	MBA	PhD
ST Balance Sheet	5.0	5.0	4.7	5.0	4.2	5.0
LT Balance Sheet	5.0	5.0	4.0	5.0	4.0	1.0
ST Income Statement	5.0	5.0	3.8	5.0	3.8	1.0
IT Income Statement	5.0	5.0	4.5	5.0	4.1	1.0
LT Income Statement	5.0	5.0	4.6	5.0	4.1	2.0
ST Segment Data	5.0	4.7	3.6	3.0	3.1	3.0
IT Segment Data	5.0	5.0	4.3	5.0	4.1	5.0
n	2	3	47	1	61	1

ST: short-term

IT: intermediate-term

LT: long-term

APPENDIX D

TABLE D-1
Nonparametric Statistics

	ANOVA		WILCOXON	
	F	p	χ^2	p
ST Decision	5.95	.004*	6.97	.03*
IT Decision	3.08	.05*	5.10	.08*
LT Decision	6.81	.002*	8.26	.02*

*Significant at .10 level

ST: Short-term

IT: Intermediate-term

LT: Long-term

VITA

Donna Lee Street was born in Johnson City, Tennessee on July 3, 1959. In September of 1977, she entered East Tennessee State University where she received a Bachelor of Business Administration (BBA) degree in accounting. Following receipt of her BBA in 1981, she accepted a graduate teaching assistantship at the University of Tennessee, Knoxville, where she studied for a Master's of Accountancy degree and later a Doctor of Philosophy degree. She received the Master's degree in March 1983 and the Ph.D. in business administration with a concentration in accounting in June 1987.

Ms. Street is a member of Phi Kappa Phi, Beta Alpha Psi, and the American Accounting Association. She accepted employment at James Madison University in September 1986.