To the Graduate Council:

I am submitting herewith a dissertation written by William Kenneth Harmon entitled "An Empirical Investigation of the Relative Strength of Association Between Market Reaction and Certain Measures of Income and Funds Flows to the Enterprise." 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 Business Administration.

James Scheiner, Major Professor

We have read this dissertation
and recommend its acceptance:

Jan Robert Williams

Richard C. Reizenstein

Sophronia W. Ward

Accepted for the Council:

L. Evans Roth
Vice Chancellor
Graduate Studies and Research

AN EMPIRICAL INVESTIGATION OF THE RELATIVE STRENGTH OF ASSOCIATION BETWEEN MARKET REACTION AND CERTAIN MEASURES OF INCOME AND FUNDS FLOWS TO THE ENTERPRISE

A Dissertation

Presented for the

Doctor of Business Administration

Degree

The University of Tennessee, Knoxville

William Kenneth Harmon

June 1982

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DEDICATION

This dissertation is dedicated to my wife, Kay, and to my parents, Bill and Catherine Harmon.

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ABSTRACT

In recent pronouncements, the Financial Accounting Standards Board has emphasized the importance of funds flows and has suggested expanded disclosure of funds flows in financial statements. The purpose of this research study was to examine the relative importance of earnings versus funds flows by evaluating the association between market reaction and three measures of income versus the association between market reaction and six measures of funds flows to the enterprise. The contemporaneous association between market reaction and each variable was assessed at the earnings announcement date of each firm in the sample for the years 1972 through 1979.

The methodology involved classifying market reaction as "good news," "bad news," or "indifference" by using daily returns in the market model. The announcement of each variable was similarly classified by using two distinct models. The Cramer statistic was used as the measure of the level of association between the categories of market reaction and the categories for each variable announcement. Each variable was also ranked according to its association with market reaction as measured by the Cramer statistic.

Even though the rankings were not very consistent between years, certain trends were noted. As a group, earnings were ranked higher than funds flows. Within the

earnings group, no variable was consistently ranked higher than other earnings variables. Within the funds flow group, net change in cash tended to be ranked higher than other funds flow variables. Total funds provided by operations was also ranked high among the funds flow variables.

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CHAPTER I

IDENTIFICATION OF THE RESEARCH QUESTION

In 1978, the Financial Accounting Standards Board (FASB) released Statement of Financial Accounting Concepts (SFAC) No. 1, Objectives of Financial Reporting by Business Enterprises [23]. This document stated that the ultimate variable which financial statements should help users assess is cash flows to the user. Specifically, the FASB asserted:

> Financial reporting should provide information to help present and potential investors and creditors and other users in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest and the proceeds from the sale, redemption, or maturity of securities or loans [23, para. 1210.37].

The FASB has also emphasized the important link between cash flows to the enterprise and cash flows to the user:

> The prospects for (users') cash receipts are affected by an enterprise's ability to generate enough cash to meet its obligations when due and its other cash operating needs, to reinvest in operations, and to pay cash dividends and may also be affected by perceptions of investors and creditors generally about that ability, which affect market prices of the enterprise's securities. Thus, financial reporting should provide information to help investors, creditors, and others assess the amounts, timing, and uncertainty of prospective net cash inflows to the related enterprise [23, para. 1210.37].

In 1979, the FASB published a discussion memorandum on Reporting Earnings [24]. This discussion memorandum presented the FASB's view of the role of earnings reports

in assessing prospective cash inflows to the enterprise:

> . . . a study of reporting earnings needs to consider the relationship between reports of information on earnings and assessments of cash flows. The relationship may be identified in a two-stage process for the assessment of future cash flows:
>
> a. Reports of past earnings are used as a basis for the assessment of future earnings
>
> b. An adjustment is then made to the assessment of future earnings to derive an assessment of future cash flows [24, p. 3].

From this prediction process came the FASB's proposal that accounting reports should include a reconciliation between earnings and cash flows to the enterprise. Further, the FASB conceded that the statement of changes in financial position may not reveal sufficient relationships to be beneficial in assessing future cash flows [24, pp. 97-98 and 25, pp. 10-11].

History of Funds Flows Disclosure

Since the beginning of this century, the presentation of funds information by companies has been an important topic [17, p. 10]. Various forms of funds flow disclosure have been proposed [15, 18, 33, 34, 37, 39, 42, 45]; however, an authoritative pronouncement was not issued until 1963. In that year, the Accounting Principles Board (APB) issued Opinion No. 3, The Statement of Source and Application of Funds [3], which recommended the presentation of a funds statement as part of a firm's financial statements. This Opinion did not make presentation of a funds statement

mandatory. In 1969, the SEC required that a funds statement be presented with all annual filings. In 1971, the APB issued Opinion No. 19, Reporting Changes in Financial Position [2], which required the presentation of a statement of changes in financial position whenever an income statement was presented.

In December 1980, the FASB issued a discussion memorandum, Reporting Funds Flows, Liquidity, and Financial Flexibility [25], which discussed the extent the present statement of changes in financial position meets the needs of financial statement users. Specifically, the following possible weaknesses of Opinion No. 19 were cited:

a. (The Opinion) fails to give satisfactory guidance about the role of the funds statement in meeting the objectives of financial reporting.

b. The resulting reports compress too much information into one statement.

c. (The Opinion) does not focus on any specific definition of funds [25, p. 10].

Need for Related Research

Before a new presentation of funds flows to the enterprise is promulgated by the FASB, the usefulness of the currently available information should be empirically evaluated. This view is supported by the FASB. The FASB also emphasized the need for discovering "the extent to which information about funds flows in financial reports represents information that is important in the determination of stock market prices" [25, p. 29]. Further, in discussing the

importance of funds flow research, the FASB summarized some of the existing research and made the following observation:

> A considerable amount of evidence . . . is available to indicate that information about funds flows is useful in practice and is used. No single research study provides clear-cut conclusions regarding the usefulness of such information [25, p. 28].

In summary, the FASB has espoused the need for more research concerning the usefulness of present disclosures of funds flows and has noted a lack of research relating funds flows and stock market prices.

Research Methodology

To date, no study has evaluated the relationship between numerous funds flow measures and stock market prices. Furthermore, no study has examined the relationship between funds flow measures and stock market prices since the issuance of APB Opinion No. 19. This study evaluates the association between six funds flow measures and stock prices for the years 1972 through 1979. Also, because researchers have found mixed results in assessing the superiority of income measures versus funds flow measures in predicting stock prices, this study evaluates the associative strength of three income measures in addition to the six funds flow measures mentioned previously. The evaluation of the superiority of income or funds flow variables is effected by ranking the income measures and the funds flow measures according to their association with market reaction in each of the years 1972 through 1979.

The association between market reaction and measures of income and funds flows is examined using a multi-step analysis. This analysis involves the following procedures:

1. Select a sample of approximately two hundred companies from the annual COMPUSTAT tapes according to the following selection criteria:
   a. The information required by APB Opinion No. 19 is available for 1971 through 1979.
   b. Current assets and liabilities are delineated in COMPUSTAT.
   c. The firm reports its statement of changes on the working capital basis according to the appropriate COMPUSTAT footnote.
   d. The firm is included on the CRSP tapes, and data are available for 1971 through 1979.
2. Using the market model and stock return information from the daily CRSP tapes, calculate the residual terms for each of the companies in the sample. These residuals are calculated for the ten days prior to and including the earnings announcement dates for each of the eight years of the study (1972-1979).
3. Test the residual terms for significant difference from zero. If significant difference is found, the reaction is classified as "good news" (GN) if the mean residual is positive and as "bad news" (BN)

if the mean residual is negative. If no significant difference from zero is found, the reaction is classified as "indifferent" (I).

4. Classify as "good news," "indifference," or "bad news" each of the following income and funds flow variables:[1]

   a. Operating income
   b. Income before extraordinary items
   c. Earnings per share
   d. Working capital provided by operations
   e. Total working capital provided
   f. Cash provided by operations
   g. Cash provided by operations to total debt
   h. Net change in cash
   i. Net change in working capital

   The announcement of each variable is categorized by using two distinct prediction models.

5. Test each of the income and funds flow variables for their strength of association with market reaction for that year. The Cramer statistic [27] is used to measure the associative strength between market reaction and each variable.

6. Rank the income and funds flow variables according to their associative strength as measured by the

---

[1]See Appendix A for a description of how these variables were derived using the COMPUSTAT tapes.

Cramer statistic. These rankings are placed into a table which shows the rankings for each of the eight years.

7. Calculate the coefficient of concordance [27] for each of the tables of rankings. This statistic indicates the degree the rankings over years are similar. This test assists in making a subjective analysis of the rankings.
8. Analyze the prevalent ranking for each table if the rankings are found to be similar over years. In this analysis, the variables which are the highest ranked among all variables are noted. Also, the funds flow variables which are highest ranked among the funds flow variables are noted. If the rankings are not found to be consistent over years, the possible reasons for that finding are discussed.

Contributions of the Study

Findings from this research study contribute to the FASB's discussion of funds flow disclosures. For example, if income variables are found to be consistently more associated with market reaction than any funds flow measures, investors may believe that income captures all relevant flows. However, investors may prefer some funds flow measure(s) other than those considered in this study. If any funds flow measure which requires computations by the

user is found to be highly associated with market reaction, the FASB may consider narrowing the focus of its discussion on funds flow disclosure accordingly. Similarly, if a funds flow measure which is presently disclosed is found to be highly associated with market reaction, present financial statements may be considered adequate in their funds flow disclosure.

The findings may have further research implications as well. If the associative strength of the independent variables fluctuates over years, further research could be undertaken to investigate the possible reasons for the fluctuation. If funds flows are found to only have associative strength in one or two years, a study could be undertaken to determine economic factors responsible for such an anomaly. Also, an extension of this research would be the investigation of other variables' and ratios' associative strength with market reaction.

The results of this research contribute to the discussion on funds flow presentations. Even though the magnitude of all relevant issues in the discussion precludes conclusive results, this research provides insight into the relationship between present funds flow information and stock market prices.

Organization of the Study

This dissertation is organized into five chapters. Chapter II contains a review of the literature related to

funds flows and market reaction research. The methodology is presented in detail in Chapter III, and the findings of the research are presented in Chapter IV. In Chapter V, conclusions and limitations related to the findings are discussed.

CHAPTER II

LITERATURE REVIEW

For the last two decades, research efforts have attempted to evaluate the usefulness of funds flow information in practice. These studies have been conducted using three distinct approaches [25]:

1. The usefulness of funds flow information to financial statement users.
2. The usefulness of funds flow information in prediction models.
3. The impact of funds flow information on stock market prices.

Major studies within the first two categories are summarized in the following two sections. The review of the third category is presented in the subsequent two sections. The first provides a general review of the market reaction literature, and the other provides a review of the literature using market reaction and funds flow data. After these reviews, the relation of this research to previously published research is examined.

Studies of Financial Statement Users

Clarkson. In a study concerning the trust investment process, Clarkson (1962) attempted to delineate the individual decisions a trust officer uses when selecting a portfolio.

Clarkson first selected several accounts from an average-size bank. Those accounts were examined to identify common items, and naive behavioral models were constructed by inferring what decisions were made by the trust officer. These models were refined by making protocols of the trust officer's decision process.

In the model constructed by Clarkson, a set of attributes was identified for evaluating each company. Included in this list were two attributes pertaining to funds flows: (1) cash flow per share and (2) working capital. When operationally defining these attributes for inclusion in a computerized model, Clarkson used the following variables:

a. Current value of cash flow per share
b. Current value of working capital
c. Ten year average of cash flow per share
d. Ten year average of working capital
e. Rate of increase of cash flow per share over the past year
f. Rate of increase of working capital over the past year
g. Average rate of change of cash flow per share
h. Average rate of change of working capital

After having the model select numerous portfolios, Clarkson subjectively analyzed the way the model evaluated the performance of a company versus the way a trust officer performs such an evaluation. This comparison was effected by

having a trust officer "think aloud" his decision process for selecting a portfolio from the available companies. In the trust officer's analysis, growth in working capital and growth in cash flow per share were often noted to be important variables. At times, these variables even appeared to prevail in the decision process [16].

Backer and Gosman. Backer and Gosman (1978) conducted a study concerned with business liquidity that involved interviewing representatives of large investment and credit institutions. These representatives reported a growing and extensive use of cash flow analysis. Every investor and creditor interviewed by Backer and Gosman reported that cash flow predictions were used in evaluating firms. The predictions of cash flows were based upon analysis of past trends and conversations with company officials.

The predictions made by these investors and creditors were used to assess a company's future dividends, capital replacement, and ability to service debt. Anytime that the investor or creditor noted a discrepancy between predicted cash inflows and future cash obligations, company officials were questioned about any potential future financing [4].

Hawkins and Campbell. The Hawkins and Campbell (1978) study provides an overview of the investors' decision processes. Specifically, 75 institutional investors were questioned about the process of valuing common stocks and the

use of financial statement data in their analyses. In summarizing how investors analyze financial profiles, Hawkins and Campbell observed that during the inflation of the early seventies investors became more aware of the need to consider cash flows. Hawkins and Campbell also noted that investors usually were not satisfied with the format of funds flow disclosure presently used. Instead, investors generally restructured the statement of changes in financial position to focus on the company's ability to finance fixed asset acquisitions internally, reliance on external financing, and future dividend possibilities in light of the company's liquidity position [32].

Khemakhem. This study primarily was designed to test two hypotheses:

1. The chief objective in making typical management decisions in the short run is more often a concern with maximizing "funds" rather than maximizing net income.
2. A manager often can utilize "funds" data more than income data for internal decision making [36, p. 522].

In order to test these hypotheses, Khemakhem divided a group of 33 financial executives into two subgroups to make management decisions in a simulated environment. One group was asked to maximize working capital. The second group was asked to maximize earnings. No teams were formed, and each player made decisions independently of the other players.

Each player was asked to (1) choose an inventory and depreciation method, (2) choose between two investment alternatives, (3) review the company's divident policy, (4) make a capital budgeting decision, and (5) measure his own performance in light of his objective of maximizing funds or maximizing earnings. For each decision, the player was asked to answer three questions:

1. What steps were taken in making the decision?
2. What statements were most beneficial in making the decision?
3. What was the decision?

Using the answers to these three questions, a chi-square test was used to determine any significant differences between the two groups.

After analysis of the chi-square statistics for the individual decisions, Khemakhem concluded that managers are primarily interested in maximizing funds in the short run. Furthermore, the study indicated that for internal decision making, the funds statement is used more often than the earnings statement [36].

The aforementioned studies illustrate the use of funds flows by financial statement users including internal decision makers. Even though these studies are limited in their generalizability, the overwhelming attention given to funds flows by users tends to confirm the FASB's contention that more funds flow information is possibly needed.

Studies Involving Prediction

Whitehurst. Whitehurst (1970) attempted to assess the usefulness of past earnings trends in predicting cash return to the user. Whitehurst's methodology incorporated three prediction models. Specifically, three research questions were addressed:

1. Can past earnings trends predict future earnings?
2. Can past earnings trends, qualified by investment cost, predict future earnings?
3. Can past earnings trends, qualified by investment cost, predict future returns to the investor?

Using a sample of 198 companies, Whitehurst constructed two prediction models for each research question. The first model was a least squares extrapolation of the independent variables for the period 1956-1962. The second model used the period 1960-1962.

Using the two prediction models, Whitehurst ranked the companies according to the predicted variables and the actual variables. For each research question and each prediction model, a rank correlation coefficient was calculated to indicate the association between the two sets of rankings. The results of Whitehurst's study are shown in Table 1.

TABLE 1

FINDINGS FROM THE WHITEHURST STUDY

Independent Variable	Dependent Variable	Prediction Period	Rank Correlation Coefficient
EPS	EPS	1956-62	.327217
EPS	EPS	1960-62	.423928
EPS/Inv. Cost	EPS/Inv. Cost	1956-62	-.007269
EPS/Inv. Cost	EPS/Inv. Cost	1960-62	.184763
EPS/Inv. Cost	Cash Return	1956-62	-.097256
EPS/Inv. Cost	Cash Return	1960-62	.146064

As indicated by the rank correlation coefficients in Table 1, the past earnings trend proved to be a poor predictor of future earnings for the period analyzed. When compared with measures of return to the investor , past earnings were virtually unrelated [46].

Beaver. Beaver (1968) conducted the primary study which found predictive power in funds flow information. In this study, Beaver matched a group of 79 failed firms to a group of nonfailed firms for the years 1954-1965. For the firms in the sample, the following two ratios were found to have the most predictive power:

1. Cash flow to total debt
2. Net income to total assets

These two ratios correctly predicted 87 percent of the cases for the year prior to failure. For the interval from two years prior to failure to five years prior to failure, the ratio of cash flow to total debt predicted failure accurately for 76 percent of the cases.[2] The ratio of net income to total assets predicted failure accurately for 71 percent to 79 percent of the cases over that same period [10].

General Market Reaction Studies

Studies testing and using the Efficient Markets Hypothesis (EMH) are replete in the accounting and finance literature [1, 5, 6, 7, 8, 9, 11, 13, 14, 20, 21, 22, 26, 28, 29, 30, 31, 35, 38, 40, 41, 44]. As a result of these studies, the semi-strong form of the EMH has been accepted by the FASB [24, p. 87] and is considered appropriate in evaluating accounting information's effect on market behavior.

A number of the EMH studies have used the market model to evaluate the impact of new information from specific firms on market behavior. This model takes the following form [21, p. 100]:

$$R_{it} = a_i + B_i R_{mt} + U_{it}$$

where

---

[2]Cash flow is defined as net income plus depreciation, depletion, and amortization.

R_{it} = return on security i in period t.

R_{mt} = return on a general market factor (e.g., Standard & Poor's 500 Index).

U_{it} = individualistic component of the return, unique to firm i.

a_i = intercept of the linear relationship.

B_i = slope of the linear relationship.

The residual term, U_{it}, reflects that portion of the total return that is not due to the movement of the security with the market as a whole. Using the market model, EMH studies have evaluated the effect of new information on the residual term.

Beaver. In another study, Beaver (1968) analyzed price residuals and volume residuals for 143 firms to determine information content in earnings-announcement weeks for the years 1961 through 1965. In this study, Beaver found that volume transactions were significantly high for week 0 (the announcement week) and especially for four weeks following the announcement. The price residuals revealed significant price adjustments for the week prior to announcement, the week of announcement, and two weeks following the announcement. The most significant price reaction was found in week 0 [11].

Ball and Brown. Ball and Brown (1968) also used the market model to determine whether annual reports were related to stock prices. In contrast to Beaver's study,

however, the Abnormal Performance Index (API) was used to study the behavior of residuals in the market model. The Ball and Brown study included an examination of the association between residual behavior (API behavior) and earnings forecast errors. The forecast errors were from predictions of income using two regression models and one naive model for 261 firms over the years 1957-1965. The authors found that a significant relationship between forecast errors from all three models and residual behavior existed. This significant relationship was depicted graphically and by the chi-square statistic. Further, they found that the relationship was significant for up to one year before the earnings announcement. In an extension of the study, Ball and Brown (1968) found that cash flow (approximated by operating income) and net income before nonrecurring items were not as successful as EPS and net income in predicting residual behavior [6].

Other market studies. Using a methodology similar to Ball and Brown, Brown and Kennelly (1972) evaluated the market reaction to quarterly disclosures [14]. May (1971) also examined the information content of quarterly earnings announcements using the market model [38]. In the May study, weekly stock price information was used in assessing the market reaction. In both the Brown and Kennelly and the May studies, quarterly earnings announcements were found to have informational content.

Market Reaction Studies Using Funds Flows

Staubus. Staubus (1965) reported on the association between common stock values and earnings, dividends, book values, and two versions of funds flows: current flows (net working capital provided by operations, less taxes) and funds flows (recurrent funds receipts less funds disbursements). Staubus used as his dependent variables a discounted stock value based on an assumed acquisition date, holding period, and discount rate. The base years in the study were 1948-1951 and 1955.

Using significance of r^2 in stepwise multiple regression, Staubus found the following relationships significant in the prediction of stock values with accounting data:

1. Current flows were more reliable than earnings.
2. Funds flow for 1 year were less reliable than earnings or current flows: funds flows for 3 and 4 years were more closely associated with discounted values than were earnings for equivalent periods and fully as closely associated with values as were current flows.
3. Dividends and book values were not as reliable individual indicators of common stock values as were earnings and current flows [43, p. 130].

In summary, Staubus found that funds flow measures did assist in the prediction of stock values.

Gonedes. Gonedes (1969) examined the association between perceived levels of risk and three accounting procedures: (1) amortization of the investment credit, (2) interperiod

tax allocation, and (3) the presentation of a funds flow statement. This study was conducted at a time when publication of a funds statement was not mandatory.

The study involved two tests of association. First, a cross-section regression analysis was performed for the years 1964-1967. The regression equation had as its dependent variable the measured cost of equity capital which was used as a surrogate of the perceived level of risk. The independent variables included a surrogate of business risk, a size variable, a surrogate of financial risk, a dummy variable for the industry, and a dummy variable for each of the accounting procedures being tested. The second test used a similar procedure to the first; however, the dependent variable in the second test was the actual rate of return on common stock. The use of this dependent variable in the second test necessitated the assumption that this ex post measure of return varies directly with the perceived level of risk.

Using the first test, Gonedes found that the presentation of a funds statement was significant at the .05 level in one year. This finding has been interpreted by some as indicating significant association in general; however, any conclusion could be viewed as highly subjective.

In the second test, the presentation of a funds statement was found to be associated with rate of return in two years. Even though the other two accounting procedures were

not significant in any year in the second test, the results pertaining to the presentation of a funds flow statement are somewhat more indicative of some association than the results from the first test [31].

Beaver and Dukes. Beaver and Dukes (1972) examined the association between security prices and alternative income measures. Specifically, earnings after tax deferral entries, earnings before tax deferral entries, and cash flow (earnings before tax deferral entries plus depreciation, depletion, and amortization) were examined. A sample of 123 firms was selected from the COMPUSTAT and CRSP tapes for the years 1963-1967. For each firm in the study, the sign of the forecast error for all five years was determined. This forecast error was computed using five forecasting models:

$$(1)\quad E(X_t) = a + bX_{mt},$$
$$(2)\quad E(X_t) = X_{t-1},$$
$$(3)\quad E(X_t) = 1/N \sum X_{t-j},$$
$$(4)\quad E(X_t) = X_{t-1} - 1/N \sum (X_{t-j} - X_{t-j-1}),$$
$$(5)\quad E(X_t) = X_{t-1} + 1/N \sum (X_{t-j} - X_{t-j-1}),$$

where

$E(X_t)$ = expected value of the earnings variable in period t,
X_t = actual value of the earnings variable in period t,
a,b = intercept and slope reflecting the linear relationship between X_t and X_{mt}. These are obtained from running time series least squares regression for security i for the period 1 to t-1.
X_{mt} = a market wide index of earnings in period t,
e_t = $X_t - E(X_t)$ = forecast error in period t (i.e., unexpected earnings),
N = number of periods used to estimate the parameters of the model [12, p. 323].

The Abnormal Performance Index was calculated using the market model. Nonparametric tests (Mann-Whitney U) of association revealed that deferral earnings were the most consistently associated with security price behavior. Non-deferral earnings was the second most consistent, while cash flow was the least consistently associated measure [12].

Corsini. Using data from 1961 through 1969, Corsini (1973) assessed the contemporaneous association between flow variables and risk-adjusted rates of return. For the years 1961 through 1967, market reaction was found to be more associated with income variables than with flow variables. No relationship between the variables and rate of return was noted for the years 1968 and 1969 [19].

Relation of This Study

The majority of studies reviewed in this chapter have found usefulness in funds flow disclosures. However, as indicated in the study by Hawkins and Campbell [32], the heavy impact of inflation in the mid-1970's has caused investors to become even more interested in cash flows. That same study indicated that investors were not satisfied with present disclosures required by APB Opinion No. 19. Since this renewed interest in cash flows, no study has fully evaluated the association between funds flow disclosures and stock market prices. This study attempts to evaluate the association between six funds flow variables and market

reaction. Four of these variables are currently disclosed in financial statements; therefore, the adequacy of these disclosures is indirectly analyzed. The other two funds flow measures involve an extrapolation of currently disclosed figures to represent cash flows. Since the Hawkins and Campbell study revealed that investors are performing their own extrapolations, this study determines whether the two variables tested here are frequently derived.

Another phase of this study involves a comparison of the association between funds flow measures and market reaction with the association between earnings measures and market reaction. No previous study has performed this comparison using numerous variables for earnings and funds flow. Furthermore, the results of previous studies have been mixed in regard to this comparison.

CHAPTER III

RESEARCH METHODOLOGY

The association between market reaction and measures of income and funds flows was examined using a multi-step analysis. This analysis involved the following procedures (each of which is discussed in more detail later in this chapter):

1. Select a sample of companies from the annual COMPUSTAT tapes.
2. Using stock price information from the daily CRSP tapes, calculate the residual terms using the market model for each of the companies in the sample.
3. Determine the significance and direction of the market reaction for each company.
4. For all companies in the sample, determine whether the announcement of each income and cash flow variable is a "good news" (GN), "bad news" (BN), or "indifferent" (I) announcement.
5. Calculate the Cramer statistic to measure the strength of association between market reaction and each of the income and funds flow variables [27].
6. Analyze the results using the Kendall coefficient of concordance to determine the degree the rankings are similar over all years [27].

Sample Selection

Using a series of 234 random numbers produced by the Statistical Analysis System, a sample was selected from the annual COMPUSTAT tapes according to the following selection criteria:

1. Since this study involved a between-years comparison of market reaction and funds flows, consistency of funds flow reporting over those years was desirable. Accordingly, only years in which APB Opinion No. 19 was applicable were considered. Opinion No. 19 information was first required in 1971; however, the methodology required comparing each year's data with the data from the preceding year. Since data were not available in 1970, 1971 could not be used as the first year of the study. The first year of examination was therefore 1972.
2. In order to maintain a consistent sample for between-years comparisons, only firms with available data for all years 1971 through 1979 were included.
3. In order to insure homogeneous reporting by sample firms, only firms reporting their statement of changes in financial position on the working capital basis were considered.
4. The methodology required the use of both the COMPUSTAT and CRSP tapes. Therefore, only those

companies included on both tapes for all years 1971 through 1979 were used.

Calculation of Residuals

The residual terms were derived by use of the market model. This model is of the following form:

$$R_{it} = a_i + B_i R_{mt} + U_{it}$$

where

R_{it} = return on security i in period t.

R_{mt} = return on a general market factor (e.g., the Standard & Poor's Composite Market Index).

U_{it} = individualistic component of the return, unique to firm i.

a_i = intercept of the linear relationship.

B_i = slope of the linear relationship.

In this model, value-weighted return on the Standard & Poor's 500 Composite Index was used as the independent variable with daily return on an individual firm's stock as the dependent variable. All return data were obtained from the CRSP tapes. This regression was performed for a period from 200 days prior to the date of the Wall Street Journal earnings announcement up to the tenth day prior to the announcement. The earnings announcement was considered an appropriate date since annual report information is likely available to the price-making investors at least by that date.

After the regression was performed for an individual company, the parameters from the regression (a_i, B_i) were

used as estimates of the parameters for the ten-day period before and including the date of announcement. The actual return on each of the ten days was compared with the estimate using the regression parameters. The difference between the actual return and the expected return is the residual. This procedure can be expressed as:

$$U_{it} = R_{it} - a_i - B_i R_{mt}$$

where

U_{it} = residual term for security i on day t.

R_{it} = actual return on security i on day t.

R_{mt} = return on a market index on day t.

a_i, B_i = regression parameters from the previous 191-day period.

Determination of Information Content

The residuals for the ten-day period for each company were analyzed for difference from zero by using a t-test on the mean of those residuals. For each announcement date for each company, the mean of the residuals was derived, and a t-statistic for that mean was computed. If the mean was positive and the t-statistic indicated that the mean was significantly above zero, the market reaction for that announcement date was classified as a good news reaction. If the mean was negative and significantly less than zero, the market reaction for that date was classified as a bad news reaction. Any mean for the ten-day period that was not found to be significantly above or below zero resulted in the market reaction being classified as indifferent. No

precedent was found in the accounting literature to indicate the appropriate alpha level to use for the t-test. Accordingly, market reaction was determined using various levels.

Analysis of Test Variables

Income and funds flow variables tested for their strength of association with market reaction were:[3]

a. Operating income (OI)

b. Income before extraordinary items (IBE)

c. Earnings per share (EPS)

d. Working capital provided by operations (WCO)

e. Total working capital provided (WCP)

f. Cash provided by operations (CO)

g. Cash provided by operations to total debt (CO/TD)

h. Net change in cash (CIC)

i. Net change in working capital (CIWC)

The first three variables were chosen because they represent the primary earnings measures for a company. Working capital provided by operations, variable d, is reflective of the funds flows before any long-terms items. Total working capital provided, variable e, reflects the funds inflow after adjusting for long-term items. Even though this measure may include certain items which do not flow through working capital accounts (e.g., an exchange of capital stock for a fixed asset), it can be argued that these types of

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[3]See Appendix A for an explanation of how these variables were derived from COMPUSTAT.

transactions are in effect net of offsetting flows through working capital accounts. Cash provided by operations, variable f, merely restates the working capital provided by operations on a cash basis by adjusting for non-cash items in the working capital accounts. The ratio of cash provided by operations to total debt, variable g, is similar to the ratio found by Backer and Gosman [4] to be of importance to investors and creditors. Also, a similar ratio was found by Beaver [10] to be a good predictor of business failure. Net change in cash, variable h, and net change in working capital, variable i, represent the most aggregated measures of funds flows in present financial statements.

The announcement of each variable was categorized as a "good news," "bad news," or "indifferent" announcement by using two distinct models. These two models are as follows:

(1) Inflation Model

Good news:

$$V_t \geq [V_{t-1} \times (i+.025)]$$

Indifference:

$$[V_{t-1} \times (i+.025)] > V_t > [V_{t-1} \times (i-.025)]$$

Bad news:

$$V_t \leq [V_{t-1} \times (i-.025)]$$

(2) Non-Inflation Model

Good news:

$$V_t \geq [V_{t-1} + (V_{t-1} \times .025)]$$

Indifference:

$$[V_{t-1} + (V_{t-1} \times .025)] > V_t > [V_{t-1} - (V_{t-1} \times .025)]$$

Bad news:

$$V_t \leq [V_{t-1} - (V_{t-1} \times .025)]$$

where

V = variable of interest

i = industry-specific inflation factor (from the Wharton Annual and Industry Forecasting Model)

t = year of examination

The first prediction model is similar to the second model used in the Beaver and Dukes study [12] except that this model incorporates inflation. This is considered a more appropriate model due to the inflation of the 1970's. The second model is an exact replication of Beaver and Dukes' second prediction model. The first model used by Beaver and Dukes is not considered appropriate for this study because that model assumed that all amounts were income figures. The third, fourth, and fifth models in the Beaver and Dukes study are not appropriate for this study since APB Opinion No. 19 information is not available for years prior to 1971.

Determination of Associative Strength

For each firm in the sample, the market reaction at each annual announcement date was categorized as GN, I, or BN. After each income and funds flow variable in each year

was similary categorized, each of these income and funds flow variables were tested for their strength of association with the market reaction for that year. To measure the strength of association between each variable and market reaction, a series of three-by-three contingency tables was established as follows:

		Test Variable		
		GN	I	BN
Market Reaction	GN	a	b	c
	I	d	e	f
	BN	g	h	i

where

a to i = number of firms in the respective category.

The Cramer statistic was used to measure the associative strength between the two variables in each contingency table. The Cramer statistic, C, was considered more appropriate than the traditional contingency coefficient because the traditional measure does not necessarily have a maximum value of one. However, the Cramer statistic does have a maximum value of one due to its computational form [27]:

$$C = [Q/(N(t-1))]^{1/2}$$

where

Q = chi-square test statistic

N = number of observations

t = minimum(r,c), where r represents the number of rows and c represents the number of columns.

That is, the maximum value of Q is N(t-1); therefore, the Cramer statistic has an upper bound of one, since the Q statistic is divided by its maximum value.

Since each of the nine income and funds flow variables was categorized using two distinct models, eighteen tables were constructed for each of the eight years of the study and for each alpha level. Figure 1 illustrates the contingency table configuration for a given year and alpha level.

Rankings on Relative Strength

The income and funds flow variables were ranked according to their associative strength as measured by the Cramer statistic. Such a ranking was performed for each year of the study and for each prediction model within a selected alpha level. After establishing these rankings, two tables (one for each prediction model) for each alpha level were constructed according to the format shown in Figure 2. A set of rankings was also assigned based on the average association of each variable. That is, the average Cramer statistic for each variable was calculated, and the variables were ranked according to these averages.

Analysis of Results

Using the tables of rankings, the Kendall coefficient of concordance was calculated. This statistic indicates the degree of association among sets of rankings. The value

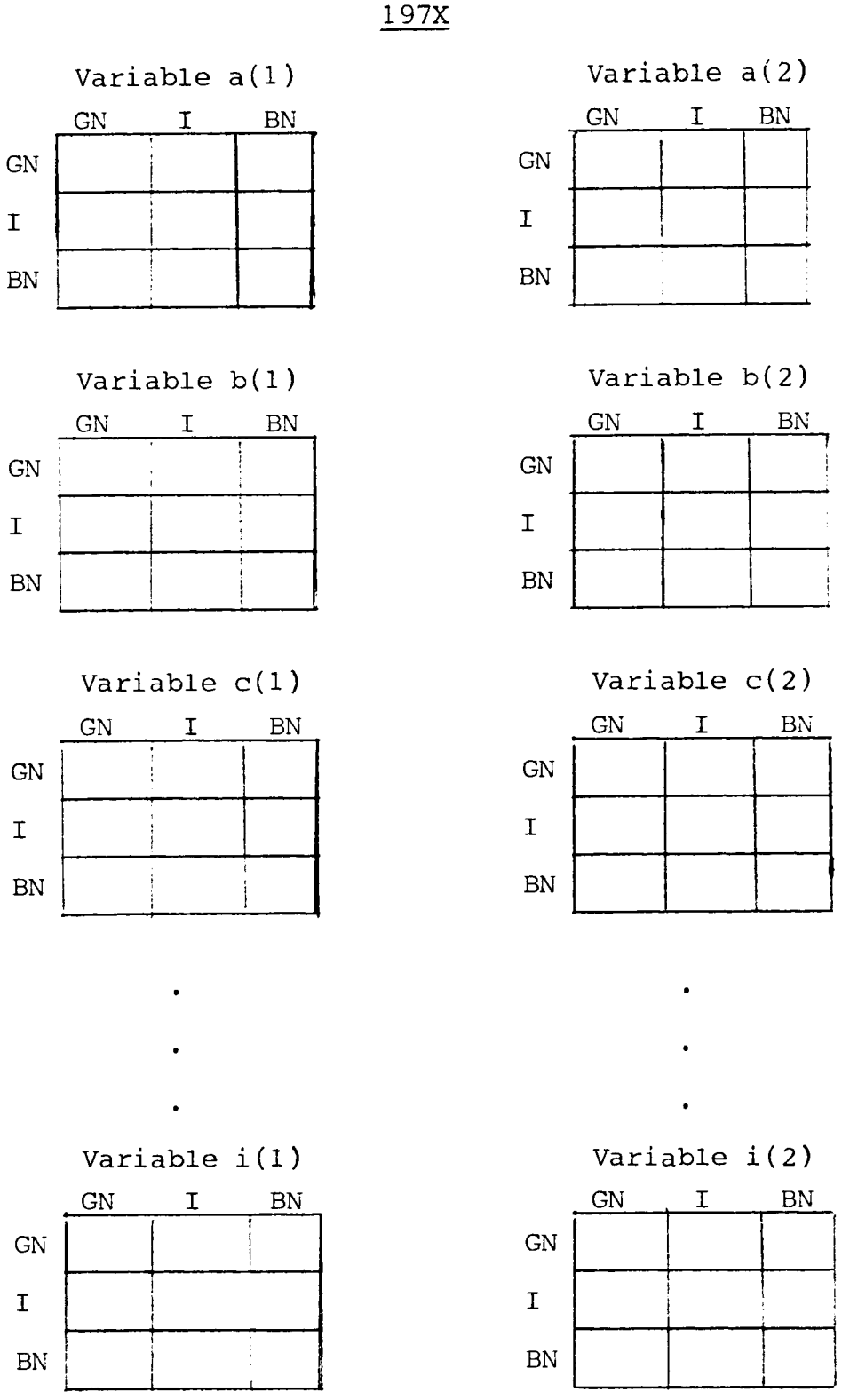

Figure 1. Contingency table configuration for year 197X.

Inflation Model

Variable	Years 1972	1973	1974	1975	1976	1977	1978	1979
a. OI								
b. IBE								
c. EPS								
d. WCO				(Rankings)				
e. WCP								
f. CO								
g. CO/TD								
h. CIC								
i. CIWC								

Non-Inflation Model

Variable	Years 1972	1973	1974	1975	1976	1977	1978	1979
a. OI								
b. IBE								
c. EPS								
d. WCO				(Rankings)				
e. WCP								
f. CO								
g. CO/TD								
h. CIC								
i. CIWC								

Figure 2. Examples of tables of rankings for test variables a through i for the two prediction models.

of this statistic always lies between zero and one, where zero indicates no association and one indicates perfect association. The computational form of the Kendall coefficient of concordance is as follows [27]:

$$W = \frac{12 \sum R_j^2 - 3k^2 n(n+1)^2}{nk^2(n^2 - 1)}$$

where

R_j = sum of the rankings for item j.

k = number of sets of ranks.

n = number of ranks within a set.

A Kendall coefficient of concordance which is significantly different from zero indicates a set of rankings is similar.

The alpha level used for measuring market reaction which resulted in greatest similarity of rankings over years as indicated by the coefficient of concordance was chosen for analysis. First, the earnings variables as a group were evaluated for their associative strength versus the funds flow variables as a group. After this analysis, the funds flow variables, d through i, were examined exclusively. That is, the rankings were analyzed to determine which of the funds flow variables were most associated with market reaction.

As previously indicated, market reaction was determined at various alpha levels. The tests of association using the contingency tables and the rankings based on association were calculated at each alpha level. The rankings over

alpha levels were examined to determine the similarity of those rankings. Such an examination was based on a subjective analysis since the underlying variables (i.e., rankings) were not continuous, thereby precluding the use of the coefficient of concordance. After analyzing the table for which the rankings were most similar and after examining the effect of alpha-level selection, the rankings based on average Cramer statistics were examined. The coefficient of concordance was used to determine whether the rankings based on average Cramer statistics were similar for the different alpha levels used to categorize market reaction.

CHAPTER IV

EXPERIMENTAL FINDINGS

The research was conducted in accordance with the procedures outlined in Chapter III. In this chapter, the execution of those steps is discussed in detail, and the research findings are presented and summarized. Conclusions and limitations applicable to the findings are discussed in Chapter V.

Sample Selection

As presented in Chapter III, a random sample of two hundred firms was drawn according to the four selection criteria:

1. The information required by APB No. 19 is available for 1971 through 1979.
2. Current assets and liabilities are delineated in COMPUSTAT.
3. The firm reports its statement of changes on the working capital basis according to the appropriate COMPUSTAT footnote.
4. The firm is included on the CRSP tapes, and data are available for 1971 through 1979.

In conducting the research, all companies which met the criteria were listed. This listed contained 1,526 companies out of a total of 2,440. A random sample of 234 companies

was drawn from the 1,526 available companies. A working sample of approximately 200 firms was desired. Since it was known that some firms would be deleted for data impropriety, 234 firms were originally selected. This sample size was reduced further as companies were deleted. These deletions are discussed in later sections of this chapter.

Calculation of Residuals

The earnings announcement dates for each company for each year of the study, 1972-1979, were derived from the Wall Street Journal Index. Companies whose earnings announcement dates were missing for two or more years were deleted from the sample. If a company had only one missing earnings announcement date, the company was retained in the sample. However, for the year in which the earnings announcement date was missing, the company was not included in the study.

Of the 234 companies in the sample, 27 (11.54 percent) were deleted for having two or more earnings announcement dates missing. Two more companies were deleted because they had identical industry and company codes yet different names and earnings announcement dates. Therefore, a maximum of 1,640 earnings announcement dates (205 companies for 8 years) could be collected. Of the 205 remaining companies, 24 had a missing earnings announcement date. These 24 dates were spread over the years of the study, and no specific industries appeared to be particularly affected. Furthermore,

the 24 dates only represent approximately 1.46 percent of the 1,640 total possible dates. The 205 companies in the sample and the 29 deleted companies are listed in Appendix B.

As stated in Chapter III, the methodology involved obtaining regression parameters for each company for the period from 10 days to 200 days prior to each earnings announcement date. The parameters were derived by using daily returns on the Standard & Poor's Composite Market Index as the independent variable in a regression model with daily returns on each company's stock as the dependent variable. In order to perform the regression, the daily stock returns for each company for each of the 191 days were obtained from the CRSP Daily Stock Index file. A regression was performed for the 191-day period for each company in each year. Hence a total of 1,616 regressions (1,640 possible dates less 24 missing dates) were performed. An intercept and slope term were derived from each of the regression models for each company for each of the years 1972 through 1979.

The next phase of the study involved calculating residuals for each of the ten days prior to and including each announcement date. However, before using the parameters obtained from the regression models as predictor variables, each company which did not have a significant slope term (beta) was deleted from the sample. After examining the regression results, the .002 level was believed to be the minimum level at which the market index had explanatory

power and at which the association between the independent and dependent variables was acceptable (as indicated by r^2). Therefore, any beta not significant at the .002 level resulted in that company being deleted from the sample for that year. The largest number of deletions occurred during this process. As is shown in Table 2, the final sample sizes were greatly reduced from the 234 companies in the original sample. However, no sample dropped to a level believed significantly low enough to affect the results. Also, no particular industries were noted to be affected by this process.

Determination of Information Content

The residuals calculated for the ten-day period prior to and including each announcement date were used to determine information content. For each announcement date of each company, the mean of the ten residuals was computed. The mean was considered appropriate since it accounted for residual size. If the mean was found to be significantly above zero, the residuals were said to reflect a good news reaction. If the mean was significantly below zero, the reaction was classified as bad news. Any non-significant reaction was classified as indifferent to the announcement.

In order to test whether each mean was significantly above or below zero, the t-statistic for the mean of each set of ten residuals was calculated. However, in attempting to determine the appropriate alpha level at which the mean could be said to be significantly above or below zero, little

TABLE 2

SAMPLE SIZES PER YEAR

Year	Sample Size
1972	130
1973	147
1974	144
1975	134
1976	125
1977	124
1978	162
1979	157

precedence was found in the accounting literature. It was decided that the final results, i.e., tables of rankings, should be presented and analyzed at different alpha levels to determine whether the level of significance had a bearing on the findings. As will be shown later in this chapter, the findings were analyzed with market reaction determined at the .15, .20, .25, and .30 levels. In conducting this research, it was assumed that numerous companies would have significant market reaction around their earnings announcement dates. The lowest alpha level at which an acceptable number of companies, i.e. more than 25 percent, had significant market reaction was fifteen percent. Therefore, no alpha level below fifteen percent was considered. The number of firms significant at each alpha level in each year is shown in Table 3.

Analysis of Test Variables

After the market reaction for each announcement date for each company had been classified as good news, indifference, or bad news at each of the four alpha levels, the earnings and funds flow variables obtained from COMPUSTAT were similarly classified. As presented in Chapter III, the two models used to classify these variables are:

(1) Inflation Model

Good news:

$$V_t \geq [V_{t-1} \times (i+.025)]$$

TABLE 3

NUMBER OF COMPANIES WITH SIGNIFICANT
MARKET REACTION AT
EACH ALPHA LEVEL

Year	Total	.15	.20	.25	.30
1972	130	39(30%)	54(42%)	61(47%)	77(59%)
1973	147	41(28%)	57(39%)	69(47%)	83(56%)
1974	144	42(29%)	52(36%)	63(44%)	88(61%)
1975	134	45(36%)	58(43%)	70(52%)	82(61%)
1976	125	33(26%)	45(36%)	62(50%)	75(60%)
1977	124	42(34%)	50(40%)	62(50%)	74(60%)
1978	162	54(33%)	65(40%)	86(53%)	103(64%)
1979	157	46(29%)	59(38%)	76(48%)	91(58%)

Indifference:

$$[V_{t-1} \times (i+.025)] > V_t > [V_{t-1} \times (i-.025)]$$

Bad news:

$$V_t \leq [V_{t-1} \times (i-.025)]$$

(2) Non-Inflation Model

Good news:

$$V_t \geq [V_{t-1} + (V_{t-1} \times .025)]$$

Indifference:

$$[V_{t-1} + (V_{t-1} \times .025)] > V_t > [V_{t-1} - (V_{t-1} \times .025)]$$

Bad news:

$$V_t \leq [V_{t-1} - (V_{t-1} \times .025)]$$

where

V = variables of interest.

i = industry-specific inflation factor (from the Wharton Annual and Industry Forecasting Model). For firms with industry codes greater than 5000, the inflation factor for all industries combined was used.

t = year of examination.

Using these two models, each variables was classified as having a good news, indifferent, or bad news announcement.

Initial Findings

The Cramer statistic, C, was used to measure the degree of association between market reaction at each of the four

alpha levels and each of the earnings and funds flow variables for each year of the study. No inherent trend was noticed in the levels of association as measured by the Cramer statistics as alpha levels were increased. That is, the levels of association were similar for the four alpha levels. The Cramer statistics are shown in Appendix C.

Once the Cramer statistics were calculated, each variable was ranked according to its degree of association with market reaction. That is, the variables were ranked according to their Cramer statistics. Since market reaction was measured at four alpha levels and two models were used for classifying the earnings and funds flow variables, eight tables of rankings were derived with eight years of rankings in each of those tables. The tables with market reaction measured at the .20 level are discussed in detail later in this chapter, and the other six tables are presented in Appendix D.

The coefficient of concordance, W, was used to determine the similarity of rankings over years within each table. For the inflation model, the coefficients of concordance had values of .09, .18, .10, and .07, respectively, for each alpha level of .15, .20, .25, and .30. For the non-inflation model, the coefficients of concordance had values of .10, .16, .07, and .03, respectively.

Since the coefficient of concordance is only a ratio of the variance of the rank sums to the maximum possible

variance of the rank sums, any interpretation of the coefficient is subjective. The maximum possible variance would be encountered when the rankings are identical over years. That is, the coefficient of concordance would equal one when the rankings are identical in every year. However, in this study the variances of the rank sums were only three percent to eighteen percent of the maximum possible variances. The rankings therefore appear to be very dissimilar over years. Any findings discussed in this chapter should therefore not be construed as generalizable, and they should not be construed as reliable for prediction.

The analysis of the tables of rankings was performed in three phases (each analysis will be discussed further later in this chapter). First, the table with the highest coefficient of concordance for each prediction model was analyzed to note which variables had the greatest association over years with market reaction. Second, a table of second-order rankings for each of the four alpha levels was constructed for each prediction model. This table was used to discern any discrepancies among the rankings at the four alpha levels and to note which variables tended to be more associated with market reaction. Finally, the average Cramer statistic for each variable at each alpha level was computed. Rankings were assigned based on those averages. This procedure resulted in four rankings for each prediction model. These four rankings were examined to determine

which variables were most consistently associated with market reaction.

Analysis of First-Order Rankings

The highest coefficient of concordance for both prediction models was obtained in the table where market reaction was measured at the .20 level. Even though the coefficient of concordance was highest for the tables at the .20 level, the value of the coefficient was only .18 for the inflation model and .16 for the non-inflation model. Therefore, any findings with regard to differences between the variables cannot be said to have significant predictive power. That is, since no trends were noted in the rankings and the coefficients of concordance indicate each year had relatively unique rankings, the use of the rankings to predict future rankings would not be warranted.

As is shown in Table 4, for the inflation model, operating income before depreciation (variable a) was the highest ranked variable over years. Net change in cash (variable h) was ranked second among all variables and was therefore the highest ranked among the funds flow variables. The variables ranked third and fourth, respectively, over years were income before extraordinary items and discontinued operation (variable b) and primary earnings per share (variable c). The variable ranked second among the funds flow variables was total funds from operations (variable d). Since earnings were ranked first, third, and fourth, the

TABLE 4

FIRST-ORDER RANKINGS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .20 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Totals
a. OI	4	2	2	3	3	8	2	2	26
b. IBE	2	4	3	8	9	6	1	1	34
c. EPS	6	6	4	9	4	3	3	3	38
d. WCO	7	3	6	6.5	5	5	4	7	43.5
e. WCP	5	7	5	6.5	2	7	6	9	47.5
f. CO	9	8.5	7.5	4.5	7.5	1.5	7.5	4.5	50.5
g. CO/TD	3	8.5	7.5	4.5	7.5	1.5	7.5	4.5	44.5
h. CIC	1	5	1	2	1	4	5	8	27
i. CIWC	8	1	9	1	6	9	9	6	49

earnings variables as a group tended to be ranked higher than were the funds flow variables as a group.

As presented in Table 5, for the non-inflation model, income before extraordinary items and discontinued operations (variable b) and primary earnings per share (variable c) were tied as the highest ranked variables. Net change in cash (variable h) was next among all variables and first among funds flow variables. Operating income before depreciation (variable a) was ranked fourth, while total funds from operations (variable d) was ranked fifth. With two variables tied for first and one variable ranked fourth, the earnings group was more associated with market reaction than was the funds flow group.

The totals from Tables 4 and 5 along with their associated second-order rankings are shown in Table 6. As Table 6 indicates, with market reaction measured at the .20 level, the rankings indicated that earnings were ranked higher than were funds flows. However, within the earnings group, no variable tended to be ranked consistently higher than other earnings variables. Within the funds flow group, net change in cash was ranked highest in both prediction models with total funds from operations being ranked second.

Analysis of Second-Order Rankings for the Inflation Model

Table 7 shows the second-order rank of each variable at each of the four alpha levels for the inflation model.

TABLE 5

FIRST-ORDER RANKINGS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .20 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Totals
a. OI	4	2	5	9	4	6	2	2	34
b. IBE	2	3	6	2	5	8	1	3	30
c. EPS	5	5	4	4	2	5	4	1	30
d. WCO	9	7	3	5	1	7	3	6	41
e. WCP	7	6	2	8	3	4	6	7	43
f. CO	6	8.5	7.5	6.5	8.5	1.5	7.5	4.5	50.5
g. CO/TD	3	8.5	7.5	6.5	8.5	1.5	7.5	4.5	47.5
h. CIC	1	4	1	3	6	3	5	9	32
i. CIWC	8	1	9	1	7	9	9	8	52

TABLE 6

RANK TOTALS AND SECOND-ORDER RANKINGS
WITH MARKET REACTION MEASURED
AT THE .20 LEVEL

Variable	Inflation Model Total	Second-Order Rank	Non-Inflation Model Total	Second-Order Rank
a. OI	26	1	34	4
b. IBE	34	3	30	1.5
c. EPS	38	4	30	1.5
d. WCO	43.5	5	41	5
e. WCP	47.5	7	43	6
f. CO	50.5	9	50.5	8
g. CO/TD	44.5	6	47.5	7
h. CIC	27	2	32	3
i. CIWC	49	8	52	9

TABLE 7

SECOND-ORDER RANKINGS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT ALL ALPHA LEVELS

	Alpha Level				
Variable	.15	.20	.25	.30	Total
a. OI	1	1	2	2	6
b. IBE	3	3	1	1	8
c. EPS	4	4	6	7	21
d. WCO	2	5	3	8	18
e. WCP	8	7	6	9	30
f. CO	7	9	9	5	30
g. CO/TD	6	6	6	3	21
h. CIC	5	2	4	4	15
i. CIWC	9	8	8	6	31

Subjective examination revealed similarity among the rankings at the four levels.

Operating income before depreciation (variable a) was on average the highest ranked variable. Income before extraordinary items and discontinued operations (variable b) was second in its association with market reaction. The third most significant variable was net change in cash (variable h). This variable was therefore the most significantly associated of the funds flow variables. Total funds from operations (variable d) again tended to have relatively high association with market reaction.

The high rankings of variables a and b, i.e. first and second, caused earnings as a group to be more highly associated with market reaction than funds flow as a group. Net change in cash was the most significant variable among funds flow variables and to some extent very significant among all variables.

Analysis of Second-Order Rankings for the Non-Inflation Model

Table 8 shows the second-order rank of each variable at each of the four alpha levels for the non-inflation model. Upon subjective examination, there was significant agreement among all rankings.

Primary earnings per share (variable c) had the highest second-order rank over the four alpha levels among all variables. Total funds from operations (variable d) had the

TABLE 8

SECOND-ORDER RANKINGS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT ALL ALPHA LEVELS

	Alpha Level				
Variable	.15	.20	.25	.30	Total
a. OI	3	4	2	3	12
b. IBE	5	1.5	3	5	14.5
c. EPS	1	1.5	4	3	9.5
d. WCO	4	5	1	1	11
e. WCP	9	6	5.5	9	29.5
f. CO	7	8	9	6.5	30.5
g. CO/TD	6	7	8	3	24
h. CIC	2	3	5.5	6.5	17
i. CIWC	8	9	7	8	32

second highest rank among all variables and therefore the highest rank among the funds flow variables. The variables with the third and fourth highest rankings were operating income before depreciation (variable a) and income before extraordinary items and discontinued operations (variable b). The fifth most significant variable was net change in cash (variable h) making this variable the second most significant among the funds flow variables.

For the non-inflation model, the second-order rankings indicate that earnings as a group were ranked higher than were funds flows, since earnings variables had the first, third, and fourth rankings. The two most significant variables within the funds flow group were total funds from operations and net change in cash.

Analysis of Average Association in the Inflation Model

The Cramer statistic was used as the association measure in this study. Another way of examining the rankings would therefore be to weight the rankings with the level of association for each variable. That is, ranking the variables on their average level of association for each model and at each alpha level gives attention to the average level of association as opposed to the mere rankings within each year.

In Table 9, the ranking based on the average Cramer statistics for each variable at each alpha level is given for the inflation model. At the .20 level, the level at which there was greatest similarity over years, the rankings

TABLE 9

RANKINGS BASED ON AVERAGE CRAMER STATISTICS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT ALL LEVELS

	Alpha Level				
Variable	.15	.20	.25	.30	Total
a. OI	2	1	2	5	10
b. IBE	1	3	1	2	7
c. EPS	4	4	6	8	22
d. WCO	5	5	5	7	22
e. WCP	9	6	8	9	32
f. CO	8	9	9	6	32
g. CO/TD	6	7	7	4	24
h. CIC	3	2	3.5	3	11.5
i. CIWC	7	8	3.5	1	19.5

based on the average Cramer statistics are identical to the second-order rankings at the .20 level except for the variables ranked sixth and seventh. Specifically, in Table 9, total sources of funds (variable e) is ranked sixth at the .20 level and funds flow to total debt (variable g) is ranked seventh. In Table 7, funds flow to total debt is ranked sixth at the .20 level, and total sources of funds is ranked seventh.

The rankings over alpha levels were similar as indicated by a coefficient of concordance of .68. Over all alpha levels, income before extraordinary items and discontinued operations (variable b) was ranked highest with operating income before depreciation (variable a) ranked second. Net change in cash (variable h) was ranked third among all variables and first among funds flow variables. Net change in working capital (variable i) was fourth among all variables and second among funds flow variables. With totals ranked first and second for variables b and a, earnings tended to be ranked higher as a group than was funds flow as a group.

Analysis of Average Association in the Non-Inflation Model

In Table 10, the rankings based on average Cramer statistics for each variable at each of the four alpha levels are shown for the non-inflation model. The coefficient of concordance for this set of rankings was .46 indicating some degree of similarity over alpha levels.

TABLE 10

RANKINGS BASED ON AVERAGE CRAMER STATISTICS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT ALL LEVELS

	Alpha Level				
Variable	.15	.20	.25	.30	Total
a. OI	2	4	4	8	18
b. IBE	3	2	1	6	12
c. EPS	1	3	5	5	14
d. WCO	5	5	3	2	15
e. WCP	6	6	7	9	28
f. CO	9	9	9	7	34
g. CO/TD	7	7	8	3	25
h. CIC	4	1	6	4	15
i. CIWC	8	8	2	1	19

At the .20 level, the findings are somewhat different than those at the .20 level for average rankings. In Table 10, net change in cash (variable h) was ranked highest among all variables at the .20 level. Income before extraordinary items and discontinued operations (variable b), primary earnings per share (variable c), and operating income before depreciation (variabla a) were ranked second, third, and fourth, respectively.

Over all alpha levels, income before extraordinary items and discontinued operations and primary earnings per share were ranked first and second, respectively. Total funds from operations (variable d) and net change in cash (variable h) were tied for the third highest ranking. With earnings variables ranked first and second, as a group, earnings were ranked higher over all levels. At the .20 level, earnings variables were ranked second, third, and fourth and were therefore ranked higher as a group at that level. Net change in cash and total funds from operations were the highest ranked among the funds flow variables.

Summary Analysis

Throughout the analyses presented in this chapter, certain observations were relatively consistent. In every analysis, the earnings variables as a group tended to be more associated with market reaction than did funds flow variables. However, within the earnings group, no one variable was consistently ranked highest. Among the funds

flow variables, net change in cash and total funds from operations were consistently ranked higher than the other variables in that group. When market reaction was measured using higher alpha levels, e.g. .25 and .30, the rankings based on average Cramer statistics indicated that net change in working capital was highly associated with market reaction relative to the other variables. At the .15 and .20 levels, however, this variable was ranked 7 and 8, respectively. Therefore, no conclusions with respect to net change in working capital would be appropriate.

Even though relatively consistent findings were noted, certain elements of those findings preclude generalizing. First, the Cramer statistic values were relatively low for all relationships examined. That is, under no circumstance was any one variable highly associated with market reaction. Ex post analysis of the findings revealed that such low Cramer statistics would be expected since the models used for categorizing the variable announcements were liberal in placing firms in the good news and bad news categories. However, even at alpha levels of .25 and .30, the market model used was very discriminating in its placing of firms in the good news and bad news categories. The result was that many firms were shown as having no association between variable announcements and market reaction. In retrospect, however, the a priori appeal of the models used to categorize the variable announcements precludes expanding the

indifference range just to make the models more discriminating. Furthermore, making the market model less discriminating by using an alpha level in excess of .30 would not appear prudent in the interest of maintaining the propriety of the results.

The findings of this research may also be affected by having numerous industries represented in the sample. This methodology requires such a large number of sample firms that performing the analysis at the industry level would not be possible. That is, the expected cell frequencies in the contingency tables would be too low. Furthermore, the analysis of individual firms over years would not be possible since there are only eight years in the study, and any contingency tables in such an analysis would also have prohibitively low expected cell frequencies.

In Chapter V, conclusions which may be made regarding these findings are presented along with selected future research possibilities. Also in that chapter are presented the limitations inherent in the methodology used for this research.

CHAPTER V

INTERPRETATION OF FINDINGS

This study was conducted to assess the relationship between market reaction and earnings variables and the relationship between market reaction and funds flow variables. Specifically, three earnings variables and six funds flow variables were tested for their relative strength of association with market reaction. The findings with respect to each variable are discussed in detail in Chapter IV. In this chapter, conclusions and limitations related to the findings are discussed. Also presented are possible extensions of the research.

Conclusions from This Study

In recent years, many authors [15, 18, 33, 34, 37, 45] have argued for greater emphasis on funds flows in financial statements. Most of those arguments have been based on the a priori appeal of funds flows and not on empirical findings. However, in response to the arguments, the FASB released the discussion memorandum related to funds flows [25]. In that discussion memorandum, the FASB cited numerous studies and concluded that "the research adds up to a strong case for believing that information about funds flows is useful [25, p. 28]." From the FASB's discussions and conclusions, the promulgation of a new standard related

to funds flows appears likely. However, the research cited by the FASB does not evaluate the association between market prices and APB Opinion No. 19 information. This study was performed to evaluate the relationship between market prices and APB No. 19 information. Furthermore, this study evaluated the associative strength that contrived cash flow variables and earnings variables have with market prices.

According to the findings reported in Chapter IV, the earnings variables were consistently more associated with market reaction than were the funds flow variables. This finding appears especially significant when viewed in light of the recent attention given to funds flows. Despite the a priori arguments made in favor of funds flows, users in the aggregate appear to place greater emphasis on earnings than on funds flows.

Within the funds flow group, one variable, net change in cash, was consistently ranked higher than the other funds flow variables. This variable is reflective of the change in cash balance and does not reveal sufficient detail to reflect cash flows for the year. Also, this variable by itself is subject to management manipulation. The ranking of the cash flow variables, cash from operations and cash flows to total debt, was a significant finding. These two variables reflect flows which are very close to cash. However, both of these cash flow variables were ranked

relatively low in the majority of the cases examined. The fact that these two variables were ranked relatively low does not necessarily indicate a lack of importance. Instead, the reaction to earnings announcements may have been so great that no other significant relationships could be detected. Further research is necessary to determine the actual importance of these cash flow variables to users.

In summary, the findings from this study provide arguments contrary to the recent positions taken by numerous authors and by the FASB. Specifically, earnings were found to be superior to funds flows in their association with market reaction. Furthermore, two cash flow variables used in the study were consistently ranked lower than the other earnings and funds flow variables in their association with market reaction. Given these findings, the FASB should reconsider the importance that should be placed on funds flow disclosures. Perhaps investors, as a group, find earnings sufficient. However, further research is necessary to draw more definitive conclusions.

Limitations of the Methodology

Generalizations of the findings of this study are subject to limitations inherent in the methodology:

a. A possible time lag exists between the time of day the market index was measured versus the time of day certain stock returns were measured.

b. The beta terms used to measure residuals may not be stable over time.

c. The inflation rate used for each industry may not have been applicable to every firm in the industry. For companies with industry codes greater than 5000, the all-industry inflation rate was used.

d. The samples were not completely homogeneous since companies were deleted for having two or more missing earnings announcement dates or for having non-significant beta terms in individual years.

e. Only large, surviving companies were used since only companies included on the COMPUSTAT and CRSP tapes for all years of the study were considered.

f. The earnings announcement dates from the Wall Street Journal Index were used as the announcement dates.

g. The classes used to categorize the variable announcements and market reaction were arbitrary and subjectively determined.

h. Numerous industries were represented in the sample, and different industries have varying funds flow requirements. A listing of the industries represented in the sample is presented in Appendix B.

i. The sample may not be considered homogeneous over time due to changes in accounting policy.

Implications for Future Research

The funds flow variable and the earnings variables found significant in this study could be used in subsequent studies assessing the usefulness of funds flow disclosures. Further, the methodology used in this study could be adapted to allow for smaller sample sizes so that intra-industry analyses could be performed.

Since the methodology used in this study results in relatively easily assessible tables of rankings, this methodology may prove beneficial in comparing other variables and/or variable groups. For example, a comparison could be made between current cost information per FASB Statement No. 33 and historical cost information. In summary, this methodology and refinements thereof could be easily applied to extensions of this research or to other research questions in the financial accounting area.

REFERENCES

REFERENCES

[1] Abdel-khalik, A.R., and Bipin B. Ajinkya. Empirical Research in Accounting: A Methodological Viewpoint. American Accounting Association, 1979.

[2] Accounting Principles Board. Reporting Changes in Financial Position. Opinion No. 19, 1971.

[3] Accounting Principles Board. The Statement of Source and Application of Funds. Opinion No. 3, 1963.

[4] Backer, Morton, and Martin L. Gosman. Financial Reporting and Business Liquidity. New York: National Association of Accountants, 1978.

[5] Ball, Ray. "Risk, Return and Disequilibrium: An Application of Changes in Accounting Techniques." Journal of Finance, 27, May 1972, pp. 343-353.

[6] Ball, Ray, and Philip Brown. "An Empirical Evaluation of Accounting Income Numbers." Journal of Accounting Research, 6, Autumn 1968, pp. 159-178.

[7] Ball, Ray, and Philip Brown. "Portfolio Theory and Accounting." Journal of Accounting Research, 7, Autumn 1969, pp. 300-323.

[8] Ball, Ray, and Ross Watts. "Some Time Series Properties of Accounting Income." Journal of Finance, 27, June 1972, pp. 663-681.

[9] Basu, S. "The Effect of Earnings Yield on Assessments of the Association Between Annual Accounting Income Numbers and Security Prices." The Accounting Review, July 1978, pp. 599-625.

[10] Beaver, William H. "Alternative Accounting Measures as Predictors of Failure." The Accounting Review, January 1968, pp. 113-122.

[11] Beaver, William H. "The Information Content of Annual Earnings Announcements." Empirical Research in Accounting: Selected Studies 1968, Supplement to Volume 6 of the Journal of Accounting Research, pp. 67-92.

[12] Beaver, William H., and Roland E. Dukes. "Interperiod Tax Allocation, Earnings Expectations, and the Behavior of Security Prices." The Accounting Review, April 1972, pp. 320-332.

[13] Brenner, Menachem. "Effect of Model Misspecification on Tests of the Efficient Market Hypothesis." Journal of Finance, March 1977, pp. 57-66.

[14] Brown, Philip, and John W. Kennelly. "The Informational Content of Quarterly Earnings: An Extension and Some Further Evidence." The Journal of Business, 45, July 1972, pp. 403-415.

[15] Buzby, Stephen L., and Haim Falk. "A New Approach to the Funds Statement." The Journal of Accountancy, January 1974, pp. 55-59.

[16] Clarkson, Geoffrey P.E. Portfolio Selection: A Simulation of Trust Investment. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962.

[17] Cole, William Morse. Accounts: Their Construction and Interpretation. Boston: Houghton Mifflin, 1908.

[18] Corbin, Donald A. "Proposal for Improving Funds Statements." The Accounting Review, July 1961, pp. 398-405.

[19] Corsini, Louis S. "An Evaluation of Alternative Accounting Flow Variables for Investor Use." Diss. Louisiana State University, 1972; Abstract. In P. Colling (Ed.), Dissertation Abstracts International. Ann Arbor, Michigan: Xerox University Microfilms, Vol. 33, June 1973.

[20] Downes, David, and Thomas R. Dyckman. "A Critical Look at the Efficient Market Empirical Research Literature As It Relates to Accounting Information." The Accounting Review, April 1973, pp. 300-317.

[21] Dyckman, Thomas R., David H. Downes, and Robert P. Magee. Efficient Capital Markets and Accounting: A Critical Analysis. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1975.

[22] Fama, Eugene F., Lawrence Fisher, Michael C. Jensen, and Richard Roll. "The Adjustment of Stock Prices to New Information." International Economic Review, 10, February 1969, pp. 1-21.

[23] FASB. Objectives of Financial Reporting by Business Enterprises. Statement of Financial Accounting Concepts No. 1, 1978. In Professional Standards. AICPA, 3, 1979.

[24] FASB. Reporting Earnings. Discussion Memorandum, 1979.

[25] FASB. Reporting Funds Flows, Liquidity, and Financial Flexibility. Discussion Memorandum, 1980.

[26] Fried, Dov, and Allen Schiff. "CPA Switches and Associated Market Reactions." The Accounting Review, April 1978.

[27] Gibbons, Jean Dickinson. Nonparametric Methods for Quantitative Analysis. New York: Holt, Rinehart and Winston, Inc., 1976.

[28] Gonedes, Nicholas J. "Efficient Capital Markets and External Accounting." The Accounting Review, January 1972, pp. 11-21.

[29] Gonedes, Nicholas J. "Some Evidence on Investor Actions and Accounting Messages--Part I." The Accounting Review, April 1971, pp. 320-328.

[30] Gonedes, Nicholas J. "Some Evidence on Investor Actions and Accounting Messages--Part II." The Accounting Review, July 1971, pp. 535-551.

[31] Gonedes, Nicholas J. "The Significance of Selected Accounting Procedures: A Statistical Test." Empirical Research in Accounting: Selected Studies, 1969, Chicago: Institute of Professional Accounting, 1970.

[32] Hawkins, David F., and Walter J. Campbell. Equity Valuation: Models, Analysis and Implications. New York: Financial Executives Research Foundation, 1978.

[33] Heath, Lloyd C. "Let's Scrap the 'Funds' Statement." The Journal of Accountancy, October 1978, pp. 94-103.

[34] Henry, Evan J. "A New Funds Statement Format for Greater Disclosure." The Journal of Accountancy, April 1975, pp. 56-62

[35] Jensen, Michael C. "The Performance of Mutual Funds in the Period 1945-1964." The Journal of Finance, 23, May 1968.

[36] Khemakhem, Abdellatif. "A Simulation of Management-Decision Behavior: 'Funds' and Income." The Accounting Review, July 1968, pp. 522-534.

[37] Lewis, Sherman L. "Needed: A More Definitive Funds Statement." The Journal of Accountancy, September 1976, pp. 48-50.

[38] May, Robert G. "The Influence of Quarterly Earnings Announcements on Investor Decisions as Reflected in Common Stock Price Changes." Empirical Research in Accounting: Selected Studies 1971, Supplement to Volume 9 of the Journal of Accounting Research, pp. 119-163.

[39] Meyers, Stephen L. "A Proposal for Coping with the Allocation Problem." The Journal of Accountancy, April 1976, pp. 52-56.

[40] Meyers, Stephen L. "The Stationarity Problem in the Use of the Market Model of Security Price Behavior." The Accounting Review, April 1973, pp. 318-322.

[41] Noreen, Eric, and James Sepe. "Market Reactions to Accounting Policy Deliberations: The Inflation Accounting Case." The Accounting Review, April 1981.

[42] Paton, W.A. "The 'Cash Flow' Illusion." The Accounting Review, April 1963, pp. 243-251.

[43] Staubus, George J. "The Association of Financial Accounting Variables with Common Stock Values." The Accounting Review, January 1965.

[44] Vigeland, Robert L. "The Market Reaction to Statement of Financial Accounting Standards No. 2." The Accounting Review, April 1981.

[45] Warren, Robert L., and Jackson A. White. "Cash Information: Toward a More Useful Statement of Changes in Financial Position." The National Public Accountant, February 1975, pp. 30-34.

[46] Whitehurst, Frederick D. "The Predictability of Investor Cash Return from Historical Income Trends of Common Stocks." The Accounting Review, July 1970, pp. 553-564.

APPENDICES

APPENDIX A

CALCULATION OF TEST VARIABLES

TABLE A.1

CALCULATION OF TEST VARIABLES

Variable of Interest	Name	COMPUSTAT Number(s)
a. OI	Operating Income Before Depreciation	13_t
b. IBE	Income Before Extra-ordinary Items and Discontinued Operations	18_t
c. EPS	Primary EPS	53_t
d. WCO	Total Funds (Working Capital) from Operations	110_t
e. WCP	Total Sources of Funds (Working Capital Provided)	112_t
f. CO	Cash from Operations	$110_t + 1_t - 1_{t-1} + 4_{t-1} - 4_t + 5_{t-1} - 5_{t-1}$
g. CO/TD	Funds (Cash) Flow to Total Debt	(Variable f)/9_t
h. CIC	Change in Cash	$1_t - 1_{t-1}$
i. CIWC	Change in Working Capital	$4_t - 4_{t-1} + 5_{t-1} - 5_t$

APPENDIX B

TABLES OF SAMPLE DATA

TABLE B.1

SAMPLES OF COMPANIES FOR
EACH YEAR OF THE STUDY

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
100	148429	Castle & Cooke Inc.	X	X	X	-	X	X	X	X
1021	717265	Phelps Dodge Corp	X	X	X	X	X	X	X	X
1041	437614	Homestake Mining	-	X	-	-	-	-	X	-
1211	276461	Eastern Gas & Fuel Assoc.	X	X	X	X	X	X	X	X
1311	374280	Getty Oil Co	X	X	X	X	X	X	X	X
1311	456623	Inexco Oil	X	X	X	X	X	X	X	X
1311	867255	Sundance Oil	-	-	-	-	-	X	X	X
1381	809163	Scope Industries Inc.	-	-	-	-	-	-	-	-
1600	406216	Halliburton Co.	X	X	X	X	X	X	X	X
1600	628454	Myers (L.E.) & Co.	-	-	-	-	-	-	-	-
1600	708713	Pennsylvania Engineering	-	-	-	-	-	-	-	X
1600	745791	Pullman Inc.	X	X	X	X	X	X	X	X
2000	033609	Anderson, Clayton & Co.	X	-	X	X	X	-	X	X
2000	126149	CPC International Inc.	X	X	X	X	X	X	X	X
2000	140573	Capitol Food Inds Inc.	-	-	-	-	-	-	-	-
2000	209219	Consolidated Foods Corp.	X	X	X	X	X	X	X	X
2000	668707	Norton Simon Inc.	X	X	X	X	X	X	X	X
2000	934051	Ward Foods Inc.	X	X	X	X	-	-	X	-
2010	127703	Cagle's Inc.	-	-	-	-	-	-	-	-

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
2030	861504	Stokely-Van Camp Inc.	X	X	X	X	X	X	-	X
2048	751277	Ralston Purina Co.	-	X	X	X	X	X	X	X
2050	343496	Flowers Industries Inc.	X	-	-	-	-	-	X	X
2085	378694	Glenmore Distilleries Co.	-	-	-	-	-	-	-	-
2085	428182	Heublein Inc.	X	X	X	X	X	X	X	X
2086	713295	Pepcom Industries	X	X	-	X	X	-	X	X
2086	780240	Royal Crown Cos Inc.	X	X	X	X	X	X	X	X
2099	854412	Stange Co.	-	X	-	X	X	-	X	X
2111	024703	American Brands Inc.	X	X	X	X	X	X	X	X
2111	212867	Conwood Corp.	-	X	X	-	-	-	X	-
2111	761753	Reynolds (R.J.) Inds.	X	X	X	X	X	X	X	X
2200	204525	Compo Inds.	-	-	-	-	-	-	X	X
2200	235773	Dan River Inc.	-	X	X	X	X	X	X	X
2200	303396	Fair-Tex Mills	-	-	-	-	-	-	-	-
2200	547779	Lowenstein (M) Corp.	X	X	X	X	X	-	X	-
2200	766481	Riegel Textile Corp.	X	X	X	X	X	-	X	X
2270	086068	Berven Carpets Corp.	X	X	X	-	-	-	X	-
2270	574803	Masland (C.H.) & Sons	X	-	-	X	X	X	X	-
2300	307387	Farah Mfg Co.	-	X	X	X	X	-	-	-
2300	409189	Hampton Industries	-	-	-	X	-	-	X	X
2300	488044	Kellwood Co.	-	-	X	X	X	X	X	X
2300	527364	Levi Strauss & Co.	X	X	X	X	X	X	X	X
2300	626320	Munsingwear Inc.	X	X	X	-	-	-	X	-

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
2300	723886	Pioneer Systems Inc.	X	X	-	-	-	-	X	X
2300	934391	Warnaco Inc.	X	X	X	X	-	X	X	X
2400	729416	Ply-Gem Industries	-	X	-	X	-	X	X	X
2450	822899	Shelter Resources	X	X	X	X	X	X	X	X
2510	497656	Kirsch Co.	X	X	X	X	X	X	X	X
2600	737628	Potlatch Corp.	-	X	X	X	X	X	X	X
2600	809877	Scott Paper Co.	X	X	X	X	X	X	X	X
2600	905530	Union Camp Corp.	X	X	X	X	X	X	X	X
2711	737424	Post Corp.	-	-	-	-	-	-	-	-
2731	441560	Houghton Mifflin Co.	X	X	X	X	X	-	-	X
2750	039375	Arcata Corp.	X	X	X	X	X	X	X	X
2750	092815	Blair (John) & Co.	X	X	X	X	X	X	X	X
2750	524876	Lehigh Press Inc.	-	-	X	-	-	X	X	X
2761	293389	Ennis Business Forms	X	X	X	X	X	X	X	X
2800	693506	PPG Industries Inc.	X	X	X	X	X	X	X	X
2800	775371	Rohm & Haas Co.	-	-	X	X	X	X	X	X
2830	002824	Abbott Laboratories	X	X	X	X	X	X	X	X
2830	561229	Mallinckrodt Inc.	-	-	-	-	-	-	-	-
2830	717081	Pfizer Inc.	X	X	X	X	X	X	X	X
2830	763172	Richardson-Merrell Inc.	X	X	X	X	X	X	X	X
2830	812302	Searle (G.D.) & Co.	X	X	-	X	X	X	X	X
2830	852245	Squibb Corp.	X	X	X	X	X	X	X	X
2841	858586	Stepan Chemical Co.	X	X	X	X	X	X	-	X
2844	054303	Avon Products	X	X	X	X	X	X	X	X

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
2844	585871	Mem Co.	X	X	X	X	-	-	X	-
2850	250595	De Soto Inc.	X	X	X	X	X	X	X	-
2850	920355	Valspar Corp.	-	X	-	-	-	-	-	X
2890	540137	Loctite Corp.	-	-	-	-	-	X	X	X
2911	110889	British Petroleum Co Ltd.	-	-	-	-	-	-	-	-
2911	443051	Howell Corp.	-	-	-	-	-	-	X	X
2911	453038	Imperial Oil Ltd-CL A	-	-	-	-	-	-	-	-
2911	747419	Quaker State Oil Refining	X	X	X	X	X	X	X	X
2911	853734	Standard Oil Co. (Ohio)	X	X	X	X	X	X	X	X
2911	881609	Tesoro Petroleum Corp.	X	X	X	X	X	X	X	X
2950	361428	GAF Corp.	X	X	X	X	X	X	X	X
3079	189000	Clopay Corp.	-	X	X	X	-	-	X	X
3079	377118	Glasrock Medical Services	X	X	-	-	X	X	-	X
3079	498494	Kleer-Vu Industries Inc.	-	X	-	-	-	X	X	-
3221	111853	Brockway Class Co.	X	X	X	X	X	X	X	X
3241	546642	Louisville Cement	-	X	-	-	-	-	-	-
3269	460578	Interpace Corp.	X	X	X	X	X	X	X	X
3310	087509	Bethlehem Steel Corp.	X	X	X	X	X	X	X	X
3310	120547	Bundy Corp.	X	X	X	X	X	X	X	X
3310	458702	Interlake Inc.	X	X	X	X	X	X	X	X
3310	819785	Sharon Steel	-	-	-	-	-	-	-	X
3310	904274	Unarco Industries Inc.	-	-	-	-	-	-	-	-

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
3310	963150	Wheeling-Pittsburgh Steel	X	X	X	X	X	X	X	X
3350	859782	Sterndent Corp.	X	X	X	X	X	X	X	X
3429	895853	Triangle Corp.	-	-	-	-	-	-	-	-
3449	594517	Michigan General Corp.	X	X	-	-	-	-	X	-
3449	718320	Philips Industries Inc.	X	X	X	X	X	X	X	X
3480	404245	HMW Industries Inc.	-	-	X	-	-	-	-	X
3499	637742	National-Standard Co.	X	X	X	-	X	X	X	X
3520	428146	Hesston Corp.	-	-	-	-	-	-	-	-
3520	627151	Murray Ohio Mfg Co.	-	X	X	X	-	X	X	X
3531	019645	Allis-Chalmers Corp.	X	X	X	X	X	X	X	X
3531	149123	Caterpillar Tractor Co.	X	X	X	X	X	X	X	X
3531	500170	Koehring Co.	-	X	X	X	X	X	X	X
3533	132627	Camco Inc.	X	X	X	-	-	-	X	X
3533	368298	Gearhart Industries Inc.	X	X	X	X	X	X	X	X
3533	629156	NL Industries	X	X	X	X	X	X	X	X
3540	172172	Cincinnati Milacron Inc.	X	X	X	X	X	X	X	X
3540	375046	Giddings & Lewis Inc.	-	X	-	X	-	X	X	X
3540	918314	VSI Corp.	X	-	X	-	-	-	X	X
3540	947015	Wean United Inc.	-	X	X	-	X	-	X	X
3550	350244	Foster Wheeler Corp.	X	X	X	X	X	X	X	X
3550	462218	Ionics Inc.	-	X	X	X	X	X	X	X
3550	694806	Pacific Scientific Co.	-	-	-	-	-	-	X	X
3558	294098	Envirotech Corp.	-	X	X	X	X	X	X	X

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
3558	760881	Research-Cottrell	X	X	X	X	X	X	X	X
3560	042627	ARO Corp.	-	X	-	X	X	X	X	-
3560	487314	Keene Corp.	X	X	X	X	X	-	X	X
3573	872005	Systems Engineering Labs	X	X	X	-	X	X	X	X
3580	167763	Chicago Milwaukee Corp.	X	X	X	X	X	X	X	X
3580	217210	Copeland Corp.	X	X	X	X	X	X	X	X
3580	889073	Tokheim Corp.	X	X	-	X	X	X	X	X
3630	604739	Mirro Corp.	X	X	-	-	-	-	X	X
3630	963626	White Consolidated Inds Inc.	X	X	X	X	X	X	X	X
3640	031897	AMP Inc.	X	X	X	X	X	X	X	X
3640	457794	Instrument Systems Corp.	X	-	-	-	-	X	-	-
3640	532253	Lightolier Inc.	-	-	-	-	-	-	-	-
3651	224174	Craig Corp.	-	X	X	-	X	X	X	X
3661	893247	Trans-Lux Corp	-	-	-	-	-	-	X	X
3670	429812	High Voltage Engineering	X	X	X	X	X	X	X	X
3679	362360	GTI Corp.	-	X	X	-	-	-	X	X
3679	460254	Intl Rectifier Corp.	X	X	X	X	X	-	X	X
3699	784197	SGL Industries Inc.	X	-	-	-	-	X	X	X
3714	822737	Sheller-Globe	-	-	-	-	-	-	-	-
3714	853836	Standard Products Co.	X	X	-	-	X	-	X	X
3714	879369	Teleflex Inc.	X	X	X	-	-	X	X	X
3720	666807	Northrop Corp.	-	X	X	X	X	X	X	X
3740	029717	American Standard Inc.	X	X	X	X	X	X	X	X
3760	884102	Thiokol Corp.	X	X	X	X	X	X	X	X

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
3811	373730	Gerber Scientific Inc.	X	-	X	X	-	-	X	X
3823	828675	Simmonds Precision Prods Inc.	X	X	X	X	X	X	X	X
3825	808655	Scientific-Atlanta Inc.	X	X	X	X	X	X	X	X
3825	880770	Teradyne Inc.	X	X	X	X	-	X	X	X
3841	071892	Baxter Travenol Laboratories	X	X	X	X	X	X	X	X
3841	075887	Becton, Dickinson & Co.	X	X	X	X	X	X	X	X
3841	630854	Narco Scientific Inc.	-	X	X	X	X	X	X	X
3841	871140	Sybron Corp.	X	X	X	X	X	X	X	X
3861	077851	Bell & Howell Co.	X	X	X	X	X	X	X	X
3914	682505	Oneida Ltd.	X	-	X	X	-	-	-	X
3940	039672	Arctic Enterprises Inc.	X	X	X	X	-	-	X	X
4011	835716	Soo Line Railroad	-	X	X	X	-	X	-	X
4011	907818	Union Pacific Corp.	X	X	X	X	X	X	X	X
4210	105187	Branch Inds.	-	-	-	-	-	-	X	X
4210	522066	Leaseway Transportation Corp.	X	X	X	X	X	X	X	-
4210	847541	Spector Industries	X	-	X	X	-	X	-	X
4400	690368	Overseas Shipholding Group	X	X	X	X	X	X	X	X
4511	011662	Alaska Airlines Inc.	-	X	X	-	X	-	X	-
4511	210795	Continental Air Lines Inc.	X	X	X	X	X	X	X	X
4511	247361	Delta Air Lines Inc.	X	-	X	X	X	X	X	X
4511	720101	Piedmont Aviation Inc.	-	-	-	-	-	-	X	X
4511	893364	Trans World Corp.	X	X	X	X	X	X	X	X
4511	967630	Wien Air Alaska	-	-	-	-	-	-	-	-

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
4811	212093	Continental Telephone Corp.	-	X	X	X	X	X	X	X
4830	024735	American Broadcasting	X	X	X	X	X	X	X	X
4830	862131	Storer Broadcasting Co.	X	X	X	X	X	X	X	X
4926	882387	Texas Eastern Corp.	X	X	X	X	X	X	X	X
4926	882440	Texas Gas Transmission	X	X	X	X	X	X	X	X
5040	395370	Greenman Brothers Inc.	X	-	X	X	-	-	X	-
5050	480827	Jorgenson (Earle M.) Co.	X	X	X	X	X	X	X	X
5065	042735	Arrow Electronics Inc.	X	X	X	X	-	X	X	X
5065	859281	Sterling Electronics	X	-	-	-	-	-	X	-
5065	983051	Wyle Laboratories	X	X	X	X	X	X	X	X
5080	121232	Burgess Inds.	X	-	-	-	-	-	X	-
5080	340567	Florida Capital Corp.	-	-	-	-	-	-	-	-
5140	252435	Di Giorgio Corp.	X	X	X	X	X	X	X	X
5199	361028	Fuqua Industries Inc.	X	X	X	X	X	X	X	X
5311	901486	Twin Fair Inc.	X	X	X	X	X	X	X	X
5331	422686	Heck's Inc.	-	-	-	-	-	-	-	-
5331	809123	Scoa Industries Inc.	X	-	X	X	X	X	X	X
5411	099855	Borman's Inc.	X	-	-	-	-	-	X	X
5411	344820	Foodarama Supermarkets	-	X	X	-	-	-	X	-
5411	501044	Kroger Co.	X	X	X	X	X	X	X	X
5411	716544	Petrolane Inc.	X	X	X	X	X	X	X	X
5411	844436	Southland Corp.	X	X	X	X	X	X	X	X
5411	855192	Star Supermarkets	-	-	-	-	-	-	X	X

TABLE B.1(Continued)

Industry Code	CUSIP Number	Company Name	Year Included in the Study							
			1972	1973	1974	1975	1976	1977	1978	1979
5600	080797	Belscot Retailers Inc.	-	-	X	-	-	-	-	-
5712	527480	Levitz Furniture Corp.	-	-	-	-	-	-	-	-
5722	934136	Wards Co Inc.	-	X	X	-	-	-	X	X
5812	194846	Collins Foods International	-	X	X	X	X	-	X	X
5812	376109	Gino's Inc.	X	X	X	X	X	X	X	X
5812	571630	Marriott Corp.	X	X	X	X	X	X	X	X
5812	795872	Sambo's Restaurants	X	X	X	X	X	-	X	-
5812	847507	Specialty Restaurants	X	X	X	X	-	-	-	-
5912	313035	Fay's Drug Co.	-	-	-	-	X	-	-	X
5912	372442	Genovese Drug Stores	-	-	-	-	-	-	-	X
5944	382748	Gordon Jewelry Corp.	X	X	X	X	X	X	X	X
5949	254660	Discount Fabrics	-	-	-	-	X	-	-	-
5980	291713	Empire Gas Corp.	-	-	-	-	-	-	-	-
5999	441776	House of Vision Inc.	-	X	X	X	-	-	X	X
6500	741003	Presidential Realty CP-CL B	-	-	-	-	-	-	-	-
7011	910688	United Inns Inc.	X	X	X	X	-	X	X	X
7200	817565	Service Corp International	X	X	X	X	X	-	-	X
7213	817664	Servisco	-	X	-	-	-	-	X	-
7370	902384	Tymshare Inc.	-	-	-	-	-	X	X	X
7810	198279	Columbia Pictures Inds.	X	X	X	X	X	X	X	X
7830	456632	Inflight Services Inc.	X	X	X	X	X	-	X	-
7990	825390	Showboat Inc.	-	-	X	-	X	-	-	X
8060	235717	Damon Corp.	-	X	X	X	-	X	-	X
9997	667528	Northwest Industries	X	X	X	X	X	X	X	X

TABLE B.2

COMPANIES DELETED FOR HAVING TWO OR MORE MISSING ANNOUNCEMENT DATES

Industry Code	CUSIP Number	Company Name
1000	043413	Asarco Inc.
1311	552901	MCO Holdings Inc.
1700	650800	Newberry Energy
2082	142263	Carling O'Keefe Ltd.
2082	806228	Schaefer (F.&M.) Corp.
2300	551675	Lynnwear Corp-CL A
2300	854867	Stanwood Corp.
2731	554790	Macmillan Inc.
2890	364424	Galveston Houston
2911	607059	Mobil Corp.
3079	157186	Cetec Corp.
3310	766889	Rio Algom Ltd.
3350	361765	GK Technologies Inc.
3499	460416	Intl Systems & Controls
3573	038213*	Applied Magnetics Corp.
3573	038213*	Dataproducts Corp.
3610	227813	Grouse-Hinds Co.
3679	268420	EECO Inc.
3728	913017	United Technologies Corp.
3820	478366	Johnson Controls Inc.
4511	886735	Tiger International
5063	180688	Clark Consolidated Inds.
5080	969207	Willcox & Gibbs Inc.
5311	020425	Almy Stores Inc.
5999	338517	Flanigan's Enterprises
7311	466272	JWT Group Inc.
7810	317297	Filmways Inc.
8911	126270	CRS Group Inc.
9997	826622	Signal Cos.

*These companies were deleted for having identical industry codes and CUSIP numbers while having different company names and different earnings announcement dates.

TABLE B.3

INDUSTRIES REPRESENTED IN THE SAMPLE

Industry Code	Industry Name	Number of Firms
100	Agricultural Production-Crops	1
1021	Copper Ores	1
1041	Gold Ores	1
1211	Bituminous Coal & Lignite Mn	1
1311	Crude Petroleum & Natural Gas	3
1381	Drilling Oil & Gas Wells	1
1600	Construction-Not Bldg Constr.	4
2000	Food & Kindred Products	6
2010	Meat Products	1
2030	Canned-Preserved Fruits-Vegs.	1
2048	Prepared Feed for Animals	1
2050	Bakery Products	1
2085	Distilled Rectif Blend Bevrg	2
2086	Bottled-Canned Soft Drinks	2
2099	Food Preparations N E C	1
2111	Cigarettes	3
2200	Textile Mill Products	5
2270	Floor Covering Materials	2
2300	Apparel & Other Finished Pds	7
2400	Lumber & Wood Products	1
2450	Wood Buildings-Mobile Homes	1
2510	Household Furniture	1
2600	Paper & Allied Products	3
2711	Newspapers: Publishing-Print	1
2731	Books: Publishing & Printing	1
2750	Commercial Printing	3
2761	Manifold Business Forms	1
2800	Chemicals & Allied Prods	2
2830	Drugs	6
2841	Soap & Other Detergents	1
2844	Perfumes Cosmetics Toil Prep	2
2850	Paints-Varnishes-Lacquers	2
2890	Misc Chemical Products	1
2911	Petroleum Refining	6
2950	Paving & Roofing Materials	1
3079	Misc Plastic Products	3
3221	Glass Containers	1
3241	Cement Hydraulic	1

TABLE B.3(Continued)

Industry Code	Industry Name	Number of Firms
3269	Pottery Products N E C	1
3310	Blast Furnaces & Steel Works	6
3350	Rolling & Draw Nonfer Metal	1
3429	Hardware-N E C	1
3449	Misc. Metal Work	2
3480	Ordnance & Accessories	1
3499	Fabricated Metal Prds N E C	1
3520	Farm & Garden Machinery & Eq	2
3531	Construction Machinery & Eqp	3
3533	Oil Field Machinery & Equip	3
3540	Metalworking Machinery & Eqp	4
3550	Special Industry Machinery	3
3558	Pollution Control Machinery	2
3560	General Industrial Mach & Eq	2
3573	Electronic Computing Equip	1
3580	Refrig & Service Ind Machine	2
3630	Household Appliances	2
3640	Electric Lighting-Wiring Eq	3
3651	Radio-TV Receiving Sets	1
3661	Tele & Telegraph Apparatus	1
3670	Electronic Components & Acce	1
3679	Electronic Components N E C	2
3699	Electrical Machy & Equip N E C	1
3714	Motor Vehicle Parts-Accessor	3
3720	Aircraft & Parts	1
3740	Railroad Equipment	1
3760	Guided Missles & Space Vehc	1
3811	Engr Lab & Research Equip	1
3823	Industrial Measurement Instr	1
3825	Elec Meas & Test Instr	2
3841	Surg & Med Instruments & App	4
3861	Photographic Equip & Suppl	1
3914	Silverware-Plateware	1
3940	Toys & Amusement Sport Goods	1
4011	Railroads-Line Haul Operatng	2
4210	Trucking-Local & Long Distance	3
4400	Water Transportation	1
4511	Air Transportation-Certified	6
4811	Telephone Communication	1
4830	Radio-TV Broadcasters	2
4926	Natural Gas Transmission	2

TABLE B.3(Continued)

Industry Code	Industry Name	Number of Firms
5040	Whsl-Sporting & Recrea Goods	1
5050	Whsl-Metals & Minerals	1
5065	Whsl-Electronic Parts & Equip	3
5080	Whsl-Machinery & Equip	2
5140	Whsl-Groceries & Related Pds	1
5199	Whsl-Nondurable Goods N E C	1
5311	Retail-Dept. Stores	1
5331	Retail-Variety Stores	2
5411	Retail-Grocery Stores	6
5600	Retail-Apparel & Acces Store	1
5712	Retail-Furniture Stores	1
5722	Retail-Hshld Appliance Store	1
5812	Retail-Eating Places	5
5912	Retail-Drug & Propriet Stores	2
5944	Retail-Jewelry Stores	1
5949	Retail-Sewing & Needlework Str	1
5980	Retail-Fuel & Ice Dealers	1
5999	Retail-Stores N E C	1
6500	Real Estate	1
7011	Hotel-Motels	1
7200	Serv-Personal	1
7213	Serv-Linen Supply	1
7370	Serv-Computer & Data Process	1
7810	Serv-Motion Picture Production	1
7830	Serv-Motion Picture Theatres	1
7990	Serv-Misc Amusement & Recrea	1
8060	Serv-Hospitals	1
9997	Nonspecified	1

APPENDIX C

TABLES OF CRAMER STATISTICS

TABLE C.1

CRAMER STATISTICS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .15 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.156	.188	.113	.111	.120	.125	.168	.096
b. IBE	.106	.132	.164	.101	.055	.175	.217	.179
c. EPS	.094	.079	.107	.080	.131	.193	.170	.134
d. WCO	.078	.137	.066	.123	.134	.181	.150	.096
e. WCP	.076	.083	.085	.087	.131	.076	.139	.086
f. CO	.058	.013	.050	.105	.123	.207	.061	.180
g. CO/TD	.110	.013	.050	.105	.123	.207	.061	.180
h. CIC	.197	.150	.071	.149	.102	.163	.092	.084
i. CIWC	.193	.171	.037	.137	.093	.061	.057	.084

TABLE C.2

CRAMER STATISTICS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .15 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.154	.159	.129	.045	.092	.161	.181	.137
b. IBE	.121	.104	.071	.165	.085	.119	.220	.136
c. EPS	.131	.118	.082	.112	.104	.165	.194	.186
d. WCO	.134	.096	.105	.072	.147	.120	.189	.132
e. WCP	.093	.079	.135	.063	.092	.135	.146	.094
f. CO	.074	.013	.050	.105	.123	.207	.061	.180
g. CO/TD	.095	.013	.050	.105	.123	.207	.061	.180
h. CIC	.197	.150	.071	.149	.102	.163	.092	.084
i. CIWC	.193	.171	.037	.137	.093	.061	.057	.084

TABLE C.3

CRAMER STATISTICS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .20 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.153	.179	.144	.116	.171	.069	.180	.155
b. IBE	.164	.137	.134	.089	.077	.114	.194	.206
c. EPS	.115	.124	.089	.047	.149	.178	.144	.138
d. WCO	.105	.138	.070	.098	.125	.123	.134	.099
e. WCP	.126	.101	.085	.098	.182	.086	.102	.055
f. CO	.095	.014	.055	.115	.102	.187	.059	.136
g. CO/TD	.157	.014	.055	.115	.102	.187	.059	.136
h. CIC	.198	.133	.178	.166	.105	.146	.130	.071
i. CIWC	.101	.209	.035	.172	.104	.029	.038	.108

TABLE C.4

CRAMER STATISTICS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .20 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.146	.198	.117	.028	.113	.108	.165	.151
b. IBE	.159	.143	.109	.168	.108	.059	.177	.138
c. EPS	.117	.127	.122	.124	.137	.118	.145	.152
d. WCO	.091	.085	.134	.120	.160	.064	.153	.122
e. WCP	.106	.099	.146	.082	.130	.126	.099	.114
f. CO	.111	.014	.055	.115	.102	.187	.059	.136
g. CO/TD	.151	.014	.055	.115	.102	.187	.059	.136
h. CIC	.198	.133	.178	.166	.105	.146	.130	.071
i. CIWC	.101	.209	.035	.172	.104	.029	.038	.108

TABLE C.5

CRAMER STATISTICS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .25 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.140	.171	.103	.133	.130	.093	.162	.108
b. IBE	.138	.152	.133	.077	.053	.189	.157	.191
c. EPS	.103	.163	.071	.045	.089	.162	.143	.113
d. WCO	.104	.173	.087	.105	.130	.139	.165	.079
e. WCP	.114	.088	.116	.071	.144	.108	.103	.095
f. CO	.080	.048	.073	.137	.115	.139	.141	.075
g. CO/TD	.136	.048	.073	.137	.115	.139	.141	.075
h. CIC	.189	.104	.133	.133	.191	.099	.132	.040
i. CIWC	.094	.204	.009	.242	.214	.089	.096	.073

TABLE C.6

CRAMER STATISTICS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .25 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.151	.193	.102	.056	.118	.124	.163	.124
b. IBE	.138	.154	.096	.156	.113	.109	.169	.131
c. EPS	.060	.146	.151	.092	.151	.119	.148	.160
d. WCO	.098	.117	.149	.106	.144	.150	.182	.098
e. WCP	.092	.098	.140	.110	.142	.122	.121	.163
f. CO	.076	.048	.073	.137	.115	.139	.141	.075
g. CO/TD	.143	.048	.073	.137	.115	.139	.141	.075
h. CIC	.189	.104	.133	.133	.191	.099	.132	.040
i. CIWC	.094	.204	.009	.242	.241	.089	.096	.073

TABLE C.7

CRAMER STATISTICS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .30 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.195	.176	.076	.111	.124	.067	.155	.110
b. IBE	.163	.187	.108	.077	.065	.164	.164	.173
c. EPS	.114	.203	.046	.058	.079	.137	.212	.101
d. WCO	.166	.168	.043	.105	.109	.127	.157	.080
e. WCP	.120	.118	.106	.106	.174	.061	.071	.062
f. CO	.106	.096	.077	.149	.151	.179	.143	.107
g. CO/TD	.149	.096	.077	.149	.151	.179	.143	.107
h. CIC	.186	.125	.150	.202	.143	.062	.123	.074
i. CIWC	.112	.249	.061	.291	.239	.108	.073	.039

TABLE C.8

CRAMER STATISTICS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .30 LEVEL

	Years							
Variable	1972	1973	1974	1975	1976	1977	1978	1979
a. OI	.171	.185	.053	.036	.150	.117	.191	.107
b. IBE	.125	.199	.091	.141	.110	.111	.148	.117
c. EPS	.134	.184	.147	.076	.096	.106	.192	.124
d. WCO	.175	.151	.148	.177	.146	.101	.187	.072
e. WCP	.097	.120	.143	.145	.159	.079	.077	.159
f. CO	.127	.096	.077	.149	.151	.179	.143	.107
g. CO/TD	.170	.096	.077	.149	.151	.179	.143	.107
h. CIC	.186	.125	.150	.202	.143	.062	.123	.074
i. CIWC	.112	.249	.061	.291	.239	.108	.073	.039

APPENDIX D

TABLES OF FIRST-ORDER RANKINGS WITH MARKET REACTION MEASURED AT THE .15, .25, AND .30 LEVELS

TABLE D.1

FIRST-ORDER RANKINGS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .15 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Total
a. OI	3	1	2	4	6	7	3	5.5	31.5
b. IBE	5	5	1	7	9	5	1	3	36
c. EPS	6	7	3	9	2.5	3	2	4	36.5
d. WCO	7	4	6	3	1	4	4	5.5	34.5
e. WCP	8	6	4	8	2.5	8	5	7	48.5
f. CO	9	8.5	7.5	5.5	4.5	1.5	7.5	1.5	45.5
g. CO/TD	4	8.5	7.5	5.5	4.5	1.5	7.5	1.5	40.5
h. CIC	1	3	5	1	7	6	6	8.5	37.5
i. CIWC	2	2	9	2	8	9	9	8.5	49.5

TABLE D.2

FIRST-ORDER RANKINGS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .15 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Total
a. OI	3	2	2	9	7.5	5	4	4	36.5
b. IBE	6	5	5.5	1	9	8	1	5	40.5
c. EPS	5	4	4	4	4	3	2	1	27
d. WCO	4	6	3	7	1	7	3	6	37
e. WCP	8	7	1	8	7.5	6	5	7	49.5
f. CO	9	8.5	7.5	5.5	2.5	1.5	7.5	2.5	44.5
g. CO/TD	7	8.5	7.5	5.5	2.5	1.5	7.5	2.5	42.5
h. CIC	1	3	5.5	2	5	4	6	8.5	35
i. CIWC	2	1	9	3	6	9	9	8.5	47.5

TABLE D.3

FIRST-ORDER RANKINGS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .25 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Total
a. OI	2	3	4	4.5	4.5	8	2	3	31
b. IBE	3	5	1.5	7	9	1	3	1	30.5
c. EPS	7	4	8	9	8	2	4	2	44
d. WCO	6	2	5	6	4.5	4	1	5	33.5
e. WCP	5	7	3	8	3	6	8	4	44
f. CO	9	8.5	6.5	2.5	6.5	4	5.5	6.5	49
g. CO/TD	4	8.5	6.5	2.5	6.5	4	5.5	6.5	44
h. CIC	1	6	1.5	4.5	2	7	7	9	38
i. CIWC	8	1	9	1	1	9	9	8	46

TABLE D.4

FIRST-ORDER RANKINGS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .25 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Total
a. OI	2	2	5	9	6	4	3	4	35
b. IBE	4	3	6	2	9	7	2	3	36
c. EPS	9	4	1	8	3	6	4	2	37
d. WCO	5	5	2	7	4	1	1	5	30
e. WCP	7	7	3	6	5	5	8	1	42
f. CO	8	8.5	7.5	3.5	7.5	2.5	5.5	6.5	49.5
g. CO/TD	3	8.5	7.5	3.5	7.5	2.5	5.5	6.5	44.5
h. CIC	1	6	4	5	2	8	7	9	42
i. CIWC	6	1	9	1	1	9	9	8	44

TABLE D.5

FIRST-ORDER RANKINGS FOR THE INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .30 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Total
a. OI	1	4	6	5	6	7	4	2	35
b. IBE	4	3	2	8	9	3	2	1	32
c. EPS	7	2	8	9	8	4	1	5	44
d. WCO	3	5	9	7	7	5	3	6	45
e. WCP	6	7	3	6	2	9	9	8	50
f. CO	9	8.5	4.5	3.5	3.5	1.5	5.5	3.5	39.5
g. CO/TD	5	8.5	4.5	3.5	3.5	1.5	5.5	3.5	35.5
h. CIC	2	6	1	2	5	8	7	7	38
i. CIWC	8	1	7	1	1	6	8	9	41

TABLE D.6

FIRST-ORDER RANKINGS FOR THE NON-INFLATION MODEL WITH MARKET REACTION MEASURED AT THE .30 LEVEL

	Years								
Variable	1972	1973	1974	1975	1976	1977	1978	1979	Total
a. OI	3	3	8	9	5	3	2	5	38
b. IBE	7	2	4	7	8	4	4	3	39
c. EPS	5	4	3	8	9	6	1	2	38
d. WCO	2	5	2	3	6	7	3	8	36
e. WCP	9	7	9	6	2	8	8	1	50
f. CO	6	8.5	5.5	4.5	3.5	1.5	5.5	5	40
g. CO/TD	4	8.5	5.5	4.5	3.5	1.5	5.5	5	38
h. CIC	1	6	1	2	7	9	7	7	40
i. CIWC	8	1	7	1	1	5	9	9	41

VITA

William Kenneth Harmon was born in Memphis, Tennessee on August 22, 1955. He attended elementary and junior high schools in Memphis and was graduated from Overton High School in May 1973. In September of that same year, he entered the University of Tennessee, and in June 1977, he received a Bachelor of Science degree in Business Administration with a major in Accounting.

In August 1977, he accepted a position as a staff accountant with Price Waterhouse and Co. in Memphis. Mr. Harmon returned to the University of Tennessee in September 1978. He received the Master of Accountancy degree in December 1980 and the Doctor of Business Administration degree with a major in Accounting in June 1982.

Mr. Harmon is a Certified Public Accountant in the state of Tennessee. He is also a member of Phi Kappa Phi, Beta Alpha Psi, Beta Gamma Sigma, the National Association of Accountants, and the American Accounting Association. He will be employed as an assistant professor in the Accounting Department of Drexel University.

Mr. Harmon is married to the former Kay Margaret Poston of Florence, South Carolina.