

IS THERE PREDICTIVE VALUE IN THE WORDS MANAGERS USE?
A KEY WORD ANALYSIS OF THE ANNUAL REPORT'S
MANAGEMENT DISCUSSION AND ANALYSIS

by

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Thanks also to God....my source of strength and wisdom. What I am and can become, I owe to God.

ABSTRACT

IS THERE PREDICTIVE VALUE IN THE WORDS MANAGERS USE?

A KEY WORD ANALYSIS OF THE ANNUAL REPORT'S

MANAGEMENT DISCUSSION AND ANALYSIS

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This study examines whether managers use linguistic style (i.e. optimistic and pessimistic tone) in the Management Discussion and Analysis (MD&A) section of the annual report to the SEC, Form 10-K, to provide information about expected future firm performance to the investors and whether market prices (investors) respond to these disclosures. Textual analysis software, Diction 5.0, is used to measure optimistic and pessimistic tone of MD&A for the year 2002 for 423 manufacturing firms.

Previous research similar to this study found evidence that managers use linguistic style or tone to reveal information to financial statement users through their textual releases in the President's Letter and in quarterly and annual earnings releases. The statistical models that resulted from my study did not

reveal the information link I expected to find between manager's beliefs about their firm's future, as expressed in the language and linguistic tone of their non-quantitative disclosures to the SEC, and actual future firm results. My findings suggest that the SEC has accomplished its stated goal of making the Management Discussion and Analysis a source of reliable information about the firm....a resource free of anything other than dependable, factual information.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
ABSTRACT.....	iii
LIST OF TABLES	vii
Chapter	Page
1. INTRODUCTION	1
1.1 Importance of Financial Information.....	1
1.2 Quantitative Information.....	2
1.3 Qualitative Information	4
1.4 Motivation for the Study	6
1.5 Significance of the Study.....	10
1.6 Organization of the Study	11
1.7 Summary Findings	12
2. LITERATURE REVIEW AND MD&A BACKGROUND.....	13
2.1 Literature Review.....	13
2.2 Management Discussion & Analysis (MD&A)	45
3. THEORY, HYPOTHESIS DEVELOPMENT, AND RESEARCH METHODOLOGY.....	52
3.1 Theoretical Basis	52
3.2 Linguistic Tone --- Prediction of Future Firm Performance	54
3.3 Short-run Market Response to MD&A Linguistic Tone.....	56

3.4 Long-run Market Response to MD&A Linguistic Tone	58
3.5 Research Methodology	59
4. ANALYSIS OF DATA COLLECTION AND REGRESSION RESULTS	71
4.1 Data Collection & Sample	71
4.2 Incidence of Optimistic and Pessimistic Words	75
4.3 Tests of Hypotheses 1a and 1b—Predict Future Performance.....	77
4.4 Tests of Hypotheses 2a and 2b—Short-run Market Reaction	85
4.5 Tests of Hypotheses 3a and 3b—Long-run Market Reaction	93
5. SUMMARY AND CONCLUSIONS	102
5.1 Summary of Findings	102
5.2 Implications	104
5.3 Limitations of the Study	105
5.4 Future Research	106
Appendix	
A. DESCRIPTION OF DICTION 5.0 TEXT ANALYSIS SOFTWARE....	108
B. DICTION 5.0 TONAL MEASURE WORD LISTS	110
C. CUSTOM LISTS OF POSITIVE AND NEGATIVE WORDS.....	113
D. ANALYSIS OF OLS DATA GENERATION ASSUMPTIONS	115
E. DATA TABLES.....	121
REFERENCES	130
BIOGRAPHICAL INFORMATION	137

LIST OF TABLES

Table		Page
1	Number of Sample Firms By Industry Group.....	122
2	Descriptive Statistics: Hypotheses 1a and 1b.....	123
3	Correlation Matrix: Hypotheses 1a and 1b Variables.....	124
4	Tests of the Associations Between Tone and Future Firm Performance.....	125
5	Descriptive Statistics: Hypotheses 2a and 2b.....	126
6	Correlation Matrix: Hypotheses 2a and 2b Variables.....	127
7	Test of Short-run Market Response to Linguistic Tone in MD&A Comments.....	128
8	Tests of Long-run Market Response to Linguistic Tone in MF&A Comments.....	129

CHAPTER 1
INTRODUCTION

1.1 Importance of Financial Information

The Financial Accounting Standards Board (the FASB), in its Statement of Financial Concepts No. 1 (1978) codified a set of objectives for financial reporting which, in part, require financial reports to provide information that is useful in making investment and credit decisions as well as being helpful in assessing a firm's prospective cash flows. The FASB further indicated in its Statement that the objectives contained therein are not restricted solely to information communicated by the quantitative financial statements. Rather the objectives cover all forms of financial reporting whether they are quantitative or qualitative (narrative).

Pursuant to Section 13 of the Securities Exchange Act of 1934, any issuer of a publicly registered security must file an annual report which covers the activities of the firm for the preceding year. As a part of the required annual report (Form 10-K), the Securities and Exchange Commission (the SEC), in Regulation S-K, requires the "management discussion and analysis of financial condition and results of operations" (hereafter MD&A). Specifically, the SEC states that the purpose of MD&A is to provide investors and other users with information necessary for the assessment of the financial condition and results of

operation of the registered firm. Central to the objectives of both the FASB and the SEC is the idea that financial statements and reports should provide investors and other users with information useful for decision making purposes. The task of identifying and extracting the information contained in a firm's financial reports has become a prime topic of accounting research during the past 45 years.

1.2 Quantitative Information

Beginning with Ball and Brown (1968) and Beaver (1968), a great deal of published accounting research has attempted to identify and explain the information content of the financial statements of publicly traded companies. Henceforth in this study the terms information content, information usefulness, and value relevance shall be used interchangeably. Much of the previous research on the usefulness of quantitative or numeric information has examined the relation between financial statement information and the firm's current and future performance as well as stock price returns. Capital market research topics of significance to researchers relate to tests of the efficient market hypothesis with respect to accounting information, fundamental analysis as it relates to accounting-based valuation, and the value relevance of financial information. The results of early capital market research suggested that accounting reports do have information content, (i.e. useful information). Further, capital markets research has found that financial statements contain information that assists in the prediction of firm performance. Obviously, if one

can predict future firm performance with some level of accuracy, one also has insight into future stock price performance for the firm.

A significant theme of capital market research during the '80s and '90s involved the examination of the earnings response coefficient because of its potential use in firm valuation and fundamental analysis. Beaver (1980) began a line of capital market research centered upon the idea that the information set reflected in stock prices contains more information than can be found in accounting earnings, suggesting that stock prices lead earnings. There is also a large stream of research that considers management or analyst forecasts and their relation to actual firm earnings and firm stock price returns. Further, a great deal of research has examined the issue of earnings management by way of discretionary and non-discretionary accruals and their effect upon firm earnings and stock price returns. Significant work has been done attempting to assess the information content of earnings announcements and the impact upon the firm's stock price. See Chapter 2 for a more detailed discussion of capital markets research literature.

The foregoing list of different areas of accounting research, capital market research and other than capital market research, focuses upon the idea that the information content of numeric financial reports includes information useful for purposes of making decisions about a firm. However, the numeric disclosures included in the financial statements and other reports of a firm are not management's only means of providing information to investors and others.

There is also a great deal of narrative (non-numeric) communication provided by management to investors and other users.

1.3 Qualitative Information

Narrative or qualitative disclosures can take a number of different forms. Companies provide such disclosures by way of the footnotes which are appended to audited financial statements. In the annual report to shareholders and the Form 10-K, required to be filed with the SEC, firms use narrative disclosures such as the president's letter and the MD&A. Additionally, firms must provide a quarterly earnings announcement and other regulatory filings. Many firms provide voluntary communications such as management forecasts, analyst presentations and conference calls, press releases, internet sites, and other corporate reports. The narrative parts included in the aforementioned reports and releases provide opportunities for managers to communicate directly with users of the firm's financial information. To users, the qualitative portion of financial reports, if reliable, is an important source of non-quantifiable information about the economic circumstances of the firm. Copeland (1978) noted the importance of qualitative disclosures to users, stating that, "The most important information is forward looking. Old news is no news. Shareholders are interested in information which can be presented in the president's letter or in an unaudited section of the annual report [MD&A].... ."

Because of the importance of narrative disclosures, in the 1980s researchers began to examine management's narrative communications by

attempting to assess the information content of the president's letter and MD&A as well as quarterly earnings announcements. Examination of the information content of narrative disclosures included efforts to assess the understandability of MD&A, assessment of a user's ability to interpret the creditability of the information content of MD&A, as well as examination of the incremental information content of prospective (forward looking) disclosures included in MD&A. Like MD&A, quarterly earnings announcements have been examined to determine the usefulness of the qualitative information contained therein. Perhaps the most studied instrument of narrative disclosure has been the president's letter contained in the corporate annual report. Subject to very limited constraint or regulation, the president's letter is deemed by some to be the ultimate communication medium available to managers. By others, the president's letter is thought of as being little more than a corporate marketing tool. As a result the letter has been the subject of serious examination which attempts to assess the level of information contained therein as well as its credibility. The information content of the narrative disclosures made by managers is the subject of a limited but increasingly important stream of accounting research. It is noteworthy that the primary focus of the majority of research upon narrative communications has been upon the content of the disclosures (the literal meaning of the words). There is a second aspect of narrative disclosures that has been examined only infrequently by researchers.

Beyond the literal meaning of the words used in narrative disclosures (the explicit information contained therein), there is evidence that managers also communicate information to users by way of the linguistic style or tone of the language they use in narrative disclosures. An optimistic tone used in qualitative disclosures would logically suggest that, all else being equal, management has a positive outlook as to the future performance of the firm. Conversely, a pessimistic tone in such disclosures might suggest that management is less than enthusiastic as to the firm's future performance prospects. A limited amount of research has examined the usefulness of the linguistic tone or style of narrative disclosures. In a few research studies, the information content of linguistic style with respect to quarterly earnings press release announcements as well as the president's letter of the annual report has been examined. To date my review has not identified any previous research that examines the usefulness of the linguistic tone of MD&A as a tool for assessing the future performance prospects of a firm. For the duration of this study, the terms optimistic and positive tone will be used interchangeably and shall be deemed to have the same meaning. Likewise, the terms pessimistic and negative tone will henceforth be used interchangeably. See Chapter 2 for a detailed discussion of the research literature on both narrative content and linguistic style.

1.4 Motivation for the Study

Chung and Pennebaker (2007) make the following observation with respect to research into the use of words as information signals:

Language is the currency of most human social processes. We use words to convey our emotions and thoughts, to tell stories, and to understand the world.

Over the last decade, a small group of researchers have adopted a somewhat different strategy. Their goal has been to understand how the words people use in their daily interactions reflect who they are and what they are doing.this approach has also forced us to begin investigations by looking at word usage rather than exploring the broader meaning of language within a phrase or sentence. (p. 343)

Chung and Pennebaker suggest that the words used in narrative prose (and the tone or emotion they suggest) are as important as the literal meaning of the words that make up the phrases and sentences. The growing interest in research focused upon linguistic style or tone has, in part, been the result of the development of a methodology based upon computer assisted language analysis. Previous attempts to analyze the tone of narrative disclosures have depended upon very subjective and laborious manual analysis (see Chapter 2). Computer software currently available allows researchers to examine larger samples of narrative disclosures and to arrive at more objective conclusions. The use of such tools yields more efficient research and leads to more useful, less subjective results that can be replicated.

In their quest for a glimpse into the future of a firm, investors search for the information contained in the firm's numeric disclosures and in the literal meanings of its narrative disclosures. Additionally, investors seek to understand management's true emotion or feelings about the firm's future. In other words, investors seek to understand the true beliefs of managers as to how the firm will

perform next year and the next year and the year after. Reliable knowledge of the future performance prospects of the firm could be invaluable to an investor. What better means to achieve such a glimpse of the future than through the eyes of the managers who run the firm and who know its possibilities better than anyone? Consistent with that idea, the SEC, in its 1987 Concept Release (SEC, 1987) commented that “MD&A is intended to give the investor an opportunity to look at the company through the eyes of management....” The obvious question for investors is how can such insight into a manager’s thoughts be obtained?

MD&A is management’s own narrative assessment of historical facts as well as certain prospective information about the firm. There are, as noted previously, three narrative documents that are consistently prepared and released by firm managements. MD&A, period earnings announcements, and the president’s letter (which is a part of the corporate annual report) all contain narrative disclosures prepared by managers. The earnings announcement, and the president’s letter, have few restraints or limitations which managers must observe. With the exception of making inaccurate, untruthful statements or blatantly hyping firm results or activities, managers have few limitations with respect to what they may discuss about their firms and the style they may use to discuss their firms in these two narrative vehicles.

MD&A on the other hand, is a document that is primarily based upon the historical results of the firm’s operations. Further, the firm’s historical operating

results are supported by the opinion of an independent auditor. Additionally, the SEC requires that certain topics be covered as a part of the disclosures. See Section 2.2.1 for a discussion of SEC required disclosures for the MD&A. Given the subject matter of MD&A, independent audit support for the firm's financial statements, and SEC regulation of the content of MD&A, it is reasonable to assume a greater level of investor confidence in MD&A disclosures than in the other two narrative vehicles noted above. Investor confidence in and the greater credibility of MD&A is the primary reason the document has been chosen as the subject of this study.

Recent advances in computer assisted language analysis have provided a more reliable tool for assessing linguistic style or tone. To my knowledge, no previous study has analyzed the linguistic tone of MD&A using textual analysis software. It seems, therefore, an interesting and useful undertaking to assess the information content of the linguistic style of MD&A by analyzing the words managers choose to use in their narrative comments. See Section 2.2.2 for additional discussion of the superiority of MD&A disclosures as the subject of this study.

By assessing the tone of MD&A as either positive (optimistic) or negative (pessimistic), this study hopes to assess management's true feelings about its firm's future performance prospects. This study posits that an optimistic tone suggests management's view of the firm's future prospects is positive and a pessimistic tone suggests the opposite. This study uses linguistic tone as a tool

to aid in the assessment of management's expectations for the future performance of the firm.

Previous research provides some limited evidence, albeit mixed evidence, that managers use linguistic tone to communicate information to financial information users (see Chapter 2). Given managers use optimistic and pessimistic tone as a communication tool, it is logical to assume that the information they communicate relates to their expectations of future firm performance. As previously stated, an optimistic linguistic tone of MD&A suggests that managers have positive expectations for the firm's future success. The opposite conclusion is suggested if the tone of MD&A is pessimistic. If management expectations about its firm's future are accurate, it follows that the linguistic tone of current MD&A has value in the prediction or estimation of the results of future firm performance. Therefore, this study addresses the question of whether or not the linguistic tone of MD&A comments has predictive value regarding the firm's future operating performance. Additionally, if linguistic tone is useful in the prediction of firm performance, to what extent is such information also useful to investors with respect to assessing the potential for future stock price returns?

1.5 Significance of the Study

This study will add to the limited amount of available research into the use of linguistic style by managers as another means of communicating information to investors and others. If, as we predict, the level of optimistic (pessimistic)

linguistic tone communicated by managers in MD&A is positively (negatively) associated with future firm performance, we will have confirmed another source of information that can be harvested from a firm's financial reports. In so doing we will have added to the usefulness of financial reports which is, according to the FASB, one of the primary objectives of financial reporting (FASB, 1978).

1.6 Organization of the Study

The remainder of this study is organized into four chapters. Chapter 2 contains a review and synopsis of empirical studies dealing with the information content of financial reports. The review considers the search for information content of quantitative information but focuses upon research into the information content of qualitative (narrative) financial information. The literature review is included to provide a foundation for this study which is supported by the results of other published research, and to demonstrate the limitations of previous work that suggests the need for this study. Additionally, Chapter 2 provides a review of the history and current regulatory environment of the MD&A. This review will consider three possible narrative disclosure vehicles for this study and will support the conclusion that the MD&A is the best of the narrative disclosure vehicles used by managers upon which to perform this study. Chapter 3 describes the theory underlying the hypothesis development for this study. Chapter 3 also describes the research methodology used in this study, the models developed for this study, the metrics to be computed and analyzed, and the sample selection criteria. Chapter 4 presents analysis and

results of this study. This chapter reports on the data collection and testing procedures, and the analysis and interpretation of the test results. Finally Chapter 5 offers a summary discussion of the findings and limitations of the study, and suggests other potential future research issues.

1.7 Summary of Findings

The purpose of this research study is to establish an association between the linguistic tone of the MD&A comments included in Form 10-K and the financial performance of a firm in future periods. Additionally, we attempt to establish an association between manager's linguistic tone in MD&A and future stock price performance of the firm. The establishment of the posited associations will provide investors with predictive tools for assessing the future firm performance and thus provide useful information for investor's use in making investment decisions about the firm. The results presented in Chapter 4 provide evidence that the tonal index terms used in the analysis of this study's three hypotheses (H1, H2, and H3) are not useful as no association is indicated between linguistic tone and future firm financial performance (hypotheses H1) or between linguistic tone and future stock price returns for the firm (hypotheses H2 & H2).

CHAPTER 2

LITERATURE REVIEW AND MD&A BACKGROUND

This chapter provides a discussion of prior literature that has examined the incremental information content included in financial disclosures. In as much as this study is focused upon the usefulness of narrative disclosures, the review of literature related to the information content of quantitative disclosures is limited. It is, however, important to briefly review the research related to quantitative disclosures because the research methodology applied to qualitative disclosures originated with the methods used in the examination of quantitative disclosures. This chapter also provides a discussion of the origin, development, and current regulatory environment of MD&A. Finally, this chapter includes a discussion of the reasoning behind the decision to use MD&A for this examination rather than the president's letter or the quarterly earnings report.

2.1 Literature Review

As noted in Section 1.2, a large body of accounting research has developed around the theme of identifying and explaining the information contained in the financial reports of publicly traded companies. As will be discussed in later sections, incremental information content is often measured using the firm's market price reaction to the release of its financial information. Such research demonstrates the relation between financial information and the

capital markets. The capital markets approach to information content research is most often applied to the numeric or quantitative disclosures contained in financial reports. In more recent years, however, researchers have begun to examine the usefulness of information contained in the narrative (qualitative) disclosures made by publicly traded firms. Narrative research first examined the literal meaning or content of narrative disclosures in a search for incremental, useful information. With the recent development of computer aided language analysis, research into the information conveyed by the linguistic style or tone of narrative disclosures has begun to appear.

2.1.1 Information Content of Quantitative Financial Disclosures

Shortly after the development of the efficient markets hypothesis by Eugene Fama of the University of Chicago (Fama, 1965), capital market research began with the work of Ray Ball, Phillip Brown and William Beaver (Ball and Brown, 1968, and Beaver, 1968). Capital market research deals with a wide array of topics. However, for purposes of this study, this review will consider tests of fundamental analysis and their association with firm performance and accounting-based valuation.

Capital market research has predominantly taken two forms, event studies and association studies. According to Kothari (2001),

In an event study, one infers whether an event, such as an earnings announcement, conveys new information to market participants as reflected in changes in the level or variability of security prices or trading volume over a short time period around the event..... If the level or variability of prices changes around the

event date, then the conclusion is that the accounting event conveys new information about the amount, timing, and/or uncertainty of future cash flows that revised the market's previous expectations.

In other words, event studies test for the presentation of new information through an accounting event. Event studies can utilize short horizons around the subject event as well as long horizons or time frames beyond the subject event. Using an event study, Ball and Brown find evidence that there is information content in accounting earnings announcements. They correlate the sign of the abnormal stock return around the date of an earnings announcement with the sign of the change in earnings from that firm's previous year. They find a significantly positive correlation.

Kothari (2001) also defined the association study as a:

....study that tests for a positive correlation between an accounting performance measure (e.g., earnings or cash flow from operations) and stock returns, both measured over relatively long, contemporaneous time periods, e.g., one year.no causal connection between accounting information and security price movements is inferred in an association study. The objective is to test whether and how quickly accounting measures capture changes in the information set that is reflected in security returns over a given period.

2.1.1.1 Valuation and fundamental analysis research

With respect to capital markets research in accounting, the principal role of fundamental analysis, through the use of key value-drivers such as financial ratios and statistics as well as earnings, growth and risk indicators, etc., is to forecast or predict a firm's future earnings and, using the firm's predicted future

earnings, to identify currently mispriced stocks. The incremental information found in the accounting information used in fundamental analysis leads to the identification of a firm's intrinsic value. By comparing a firm's intrinsic value to its market value, a researcher identifies mispriced securities which may provide a potential for achieving abnormal returns. The final step in fundamental analysis research is often to assess the degree of success of the intrinsic valuation by examining the size of the firm's risk adjusted returns that result from investments in the firm's shares during periods following the date of the fundamental valuation. A good model of fundamental value should be expected to generate either positive or negative abnormal returns. Kothari (2001) observes that "early capital markets research demonstrates that accounting reports have information content and that financial statement numbers reflect information that influences security prices,...". It should be noted that, although this result suggests the presence of inefficient capital markets, the efficient market hypothesis is not the focus of this study. Though it is difficult, if not impossible, to separate the question of fundamental analysis from that of efficient markets, this study is focused upon identifying and determining the value relevance of the financial information identified with fundamental analysis.

Ou and Penman (1989a) (hereafter OP) began a stream of research which examines earnings/returns prediction using multivariate analysis of financial information. Their research centers upon the question of whether the information contained in various combinations of financial ratios provides a better

(more accurate) prediction of future earnings. OP, using a statistical process, reduced a long list of financial ratios to a substantially smaller list which they find to be the most effective subset of ratios for use in predicting future earnings. They extract a summary value from the reduced list of fundamental values which they believe to be an indicator of the direction of future firm earnings. Based upon the summary value, OP simulated securing positions in a portfolio of stocks and observed the returns to their simulated investment positions. Their simulated results indicate that the summary value “robustly predicts future stock returns.” OP suggests that “It appears that this fundamental measure captures equity values [information] that are not reflected in stock prices.”

A number of other studies which extended earnings prediction research have followed Ou and Penman. Lev and Thiagarajan (1993) (hereafter LT) identified a limited set of twelve (12) fundamental signals which reflect current accounting data frequently used to analyze financial statements and to predict future earnings changes. The signals, which include information about changes in inventories, accounts receivable, gross margins, selling expenses, capital expenditures, and others, represent traditional elements of fundamental analysis most frequently employed by financial analysts to predict future firm performance. LT established the information content of the fundamental signals by showing that the current signals are significantly associated with changes in the firm’s subsequent earnings. Using the association of fundamental signals to subsequent earnings changes, LT were able to suggest that fundamentals add

significantly to the explanatory power of earnings with respect to excess investment returns. LT further demonstrate a stronger earnings-fundamental signals relationship when the fundamental signals are examined in the economic context of the market. “For example, several fundamentals that appear only weakly value-relevant or even irrelevant in the unconditional analysis exhibit strong association with returns under specific economic conditions.” They further theorize that investors use fundamental signals, as identified in the first section of their study, in order to determine the quality of reported earnings.

Abarbanell and Bushee (1997) (hereafter AB97) are more consistent with OP by examining whether current changes in fundamental financial signals contain information about changes in future earnings rather than returns. AB97 examines the relation between fundamental signals and future returns by developing a benchmark to determine how efficiently analysts use fundamental signals in their earnings forecast revisions. AB97 attempts to determine which of the fundamental signals used by analysts actually have an impact upon their earnings forecasts. AB97 further assesses whether the information contained in the fundamental signals was fully used by the analysts. AB97 find that analysts’ forecasts do not fully capture all of the information that investors believe is contained in fundamental financial signals.

In a subsequent paper, Abarbanell and Bushee (1998), (hereafter AB98) apply the logical next step to their earlier paper by developing an investment strategy based upon fundamental signals. The authors believe their strategy will

yield abnormal returns as firm earnings are realized in future periods if current stock price reaction to the fundamental signals has not been completed when the fundamental signals first become known to investors. AB98 assume an inefficient market. Using their strategy, AB98 demonstrate significant abnormal returns over the twelve (12) month period following the date of origin of the fundamental signals.

In Ball (1992), the author suggests that the relation between accounting earnings/information and predictable future abnormal stock returns is an anomaly. “The anomaly is that estimated future abnormal returns are predicted by public information about future earnings, contained in (1) current earnings and (2) current financial statement ratios.” According to Ball, the issue, up until that time, was not that an anomalous relation existed between accounting earnings and future abnormal returns but was instead that no explanation for the relation existed. Ball hypothesized that, if the true relation between earnings information is the accurate prediction of future abnormal earnings, then that relation implies market inefficiency. Alternatively, Ball posits that a relation between current earnings and the prediction of future abnormal returns could reflect research design bias that causes errors in predicting abnormal returns. Ball concluded that the evidence was unclear as to which of his intuitions actually explained the earnings-return anomaly.

Using another model, Nissim and Penman (2001) (hereafter NP) develop a structured approach to financial statement analysis useful for forecasting future

earnings and predicting future firm valuation. NP used financial statement information to analyze a firm's profitability and growth through the concept of residual income. They hypothesized that profitability and growth were drivers of firm value. NP noted that the overall perspective of their research is forecasting and, through forecasting, to ultimately identify a realistic valuation of the firm. They believed that they successfully created a more structured approach such that financial statement analysis is the first step toward analysis of the prospective success of the firm in the future. Ratios, they concluded, "are identified as drivers of future residual earnings, free cash flow, and dividends. Ratios in current financial statements are then viewed as information to forecast the future drivers [of profits and growth]."

There is a lengthy list of work that examines the role of specific financial components and ratios in the prediction of future firm earnings and stock returns. For example, Penman (1996) examines the price-earnings ratio and the book-to-market ratio as they relate to predicting future growth and thus future stock returns. Fairfield, Sweeney, and Yohn (1996) confirm that disaggregation on the income statement is useful in forecasting future profitability and, as a result, future ROE (return on equity). Piotroski (2000) examines the use of basic fundamental analysis on an investment portfolio made up of firms with high book-to-market ratios. Piotroski demonstrates that investors can assemble stronger portfolios by using basic fundamental analysis screens based upon historical financial performance. Yet another example of research into the use of

fundamental analysis ratios for the prediction of earnings is Beaver and Ryan (2000). They break down the “bias” and “lag” elements of the price-to-book ratios in order to forecast future book returns on equity. Lakonishok et al. (1994) test whether the indicators of cash flow yield and sales growth generate long-term abnormal returns.

Although the methodological approach is often different, all of the research discussed above is connected by a common theme...the use of fundamental analysis in the identification of mispriced securities. Through the use of a form of fundamental analysis, each of the referenced studies seeks to determine the intrinsic value of a firm. By comparing the firm’s intrinsic value to its market valuation, the studies seek to identify stocks that can potentially produce returns superior to those of the market average. .

Why is the fundamental analysis of quantitative financial information relevant to our current study of the information content of qualitative disclosures? As has been noted, the purpose of fundamental analysis is to capture incremental financial information useful in identifying mispriced stocks. In fact, the whole of capital markets research deals with the “information content” of financial statements for the purpose of determining stock prices. The fundamental analysis research reviewed herein is the precursor of this study and all other research into the information content of qualitative disclosures. Because the purpose of and the methodology of the research reviewed herein is

consistent with the growing body of narrative disclosure research, its review is a relevant and necessary part of this study.

2.1.2 Information Content of Narrative Disclosures

In *Statement of Financial Accounting Concepts No. 1*, the FASB commented that a major limitation of financial statements is that they “largely reflect the financial effect of transactions and events that have already happened” (FASB, 1978, para.21). Financial statement users have become increasingly aware that the textual or narrative disclosures made by company managements include information useful in the decision making process. Since the late 1960’s, a voluminous amount of research has examined quantitative financial disclosures while only a modest amount has investigated the information content (usefulness) of narrative disclosures. While research into the information content of quantitative financial disclosures continues today, only in more recent years have researchers begun to explore narrative disclosures. Specifically researchers have pursued the question of “is there useful information to be found and understood in the numerous qualitative disclosures made by company managements?” In an early study regarding the usefulness of qualitative disclosures, Katherine Frazier (Frazier, 1981) theorized as to the importance of the usefulness of non-quantitative disclosures:

Since management is so intimately familiar with an enterprise’s financial condition, it can be an excellent source of information on not only an enterprise’s current position, but on the nature and achievability of activities planned for the future. Investors, with a stake in the future of the firm, logically seek information which will

allow them to predict the future position of the firm. Decision makers will therefore use all available sources of reliable information,...

Because she recognized that narrative disclosures contain management's assessments of prospective firm performance, Frazier turned to narrative disclosures in order to assess their usefulness. Frazier's study was one of the first efforts to analyze the information conveyed by way of the language used by management.

There are two generally used approaches to the analysis of narrative disclosures. Analysis of the disclosure's content or subject matter is the more frequently used approach. Content analysis uses a number of different means to examine and identify the content of narrative disclosures. According to McConnell, Haslem, and Gibson (1986), "Content analysis can be characterized as the systematic enumeration, coding and classification of words and phrases for the purpose of analyzing message content." The researcher attempts to understand the association between the narrative disclosure and either current/future firm performance or with future firm valuation/stock returns. The finding of relevant information in the disclosures is based upon there being a positive association between the disclosures and firm performance.

The second approach to the analysis of narrative disclosures is by examination of the linguistic or semantic elements of the disclosures, (i.e. how the disclosures are written). This methodology is based upon examining the words and/or the linguistic structure of the narratives rather than examining the

specific subject matter of the disclosures. This second methodology has been used less frequently than has the former, however, it is the methodology employed in this current study.

Much of the narrative disclosure research focuses upon three documents prepared and distributed by managements; the president's letter (part of the annual report), the quarterly earnings announcement, and the management discussion and analysis section of the firm's annual report. The following is a review of the pertinent literature relating to each of these three communication vehicles.

2.1.2.1 President's Letter

Each annual report includes a letter from the president or chairman (here after the PL) to the shareholders of the company. The conventional wisdom in the early 1980's was that the PL is a carefully crafted public relations document with little, if any, significant, reliable content. However, in 1986 Dennis McConnell et al. (McConnell, Haslem, and Gibson, 1986), used content analysis to assess the usefulness of the statements contained in the PL. By reviewing a sample of 100 president's letters, the authors identified nine (9) recurring themes consistently discussed in their sample letters. The themes included confidence in the future (optimism), market context, growth, statement of strategic plans, changing product mix, imminent losses, imminent gains, positive references to the coming years, and positive references to the following year.

McConnell et al. subsequently identified a sample of 40 high and low performing NYSE companies for the years 1980 through 1983. The PL for each of the sample companies was analyzed to determine the frequency with which each of the nine recurring themes was discussed. The authors expect a difference in the themes discussed in the high and low performing company letters, (i.e. more high performers should mention gains and more low performers should mention losses). McConnell et al. did, in fact, find that high performing companies generally include discussion of imminent gains and demonstrate confidence about the future, while low performing companies discussed imminent losses more frequently. The authors further find the stock prices of the firms that discuss imminent gains and express confidence in the future performed better in the subsequent year than did those firms that discuss imminent losses in the PL. The authors conclude that, although an investor cannot rely solely on the PL to forecast a firm's stock price performance, dismissing the PL without consideration would likely result in the loss of important signals.

Kohut and Segars (1992) (hereafter KS) took much the same approach as did McConnell et al. by using content analysis of the PL as a means of identifying high and low performing firms. The themes identified by KS are environment, growth, operating philosophy, markets and products, unfavorable and favorable financial reference. However, KS expanded their study by examining the additional questions of (1) can word count, or the number of

sentences about a theme, or the average number of syllables per word used in the PL differentiate between high and low performing firms, and (2) can the number of references to prior or future periods aid in the identification of high and low performing firms? KS find that, like McConnell et al., they are able to accurately classify firms as high and low performing based upon the dominant themes. The authors suggest that their results confirm that firms use a consistent communication strategy within the annual report based upon favorable or unfavorable company performance. Since the KS findings suggest the existence of a corporate communication strategy, the authors believe that additional analytical attention should be paid to the words managers use to present firm performance.

Abrahamson and Amir (1996) (hereafter AA) use word analysis (linguistic analysis) to calculate a numeric measure of the negativity expressed by management in the PL. The authors use the numeric negativity measure to examine the extent of the association between the information content of the PL and certain firm-specific accounting performance measures as well as the firm's stock returns. The authors selected the president's letter for their analysis because they believe the PL to be less restricted by SEC regulations when compared with financial statement footnotes and the MD&A. Because of the unrestricted nature of the PL, AA suggest that it allows management to provide statement users with useful information perhaps not included in the financial statements. The lack of restriction referred to by AA deals with the fact that,

unlike financial statements or the MD&A, there are no detailed requirements by the SEC or FASB as to specific types of information that must be presented or specific rules as how information must be presented in president's letter. We will discuss this topic more in Section 2.2.3.

The methodology employed by AA begins with the selection of a set of words that suggest or imply negativity with respect to a firm's activity or an expected outcome. The list of negative words is then reviewed by multiple coders (human coders) to eliminate negative words not used in a negative context within the firm's particular PL. The actual number of negative words included in the PL when divided by the total words in the PL provides a measure of negativity for the letter. Using OLS regression, AA examines the association between five accounting performance measures and the previously computed negativity measure. The accounting performance measures used in the AA analysis include, among others 1) the percent change in net sales, 2) return on stockholder equity, and 3) changes in earnings per share divided by beginning of year stock price. To further examine the question of how shareholders utilize information contained in the PL, AA examines the association between the firm's stock returns and the negativity measure. The authors partitioned their sample based upon high and low negativity firms. Firms whose negativity measure exceeded the median negativity measure for the entire sample were labeled high negativity firms. Those below the median were labeled low negativity firms. The

authors expect that low negativity firms will have higher accounting performance statistics and higher stock price returns than will the high negativity firms.

Abrahamson and Amir find there is an association between the negativity of the information in the PL and the future performance of the firm. They find an association, albeit a weak association, between the negativity measure and the stock price returns of the firm. Nevertheless, the authors are able to conclude that the president's letter does contain useful information about the future of the firm.

Other research in which the primary interest is the information content of the PL includes Abrahamson and Park (1994) who use content analysis to examine the PL explanations for company performance during the preceding period. Tennyson, Ingram, and Dugan (1990) use content analysis to examine the narrative disclosures of the PL in an attempt to associate the disclosures with firm financial failure. They do not differentiate between either positive/negative or good/bad content and were not able to produce strong empirical results. Smith and Taffler (1999) (here after ST), however, also use content and word analysis to assess the association of information contained in the PL and firm bankruptcy. ST, in contrast to Tennyson et al., find the negative elements of the PL to be highly associated with company financial failure. Rogers and Grant (1997) are interested in comparing the content of the annual report and sell-side analysts reports for the same period. They conclude that the narrative sections of the annual report (the president's letter and the MD&A) contain about twice the

amount of useful information as do the basic financial statements. Further, they note that the average narrative sections of the annual report contain at least 40% of the information cited by analysts. Clatworthy and Jones (2003) examine the PL of 50 top and 50 bottom performing UK firms. They find that, notwithstanding the firm's earnings performance level, all firms engage in image management by concentrating upon positive information and either avoiding or deflecting attention away from negative information.

Interest in empirical research which explores the identification of the useful information contained in the president's letter has increased in recent years. Though the results of this research has, in a few cases, been mixed, the usefulness of the incremental information content of the PL for the purpose of the prediction of future firm performance and future stock price returns does appear to have been established.

2.1.2.2 Earnings Announcements

Like the president's letter, the earnings press release (both quarterly and annual) has also been a frequent subject of the search for incremental information. This review has considered research that focuses upon the qualitative disclosures that are included in earnings announcements. Hoskin, Hughes, and Ricks (1986) (here after HHR) is one such early effort in which the authors seek to assess the incremental information content of additional narrative firm disclosures released either concurrently or within one or two days of the annual earnings announcement. Most studies prior to HHR focused upon

the information contained in the firm's numeric earnings alone, without consideration of its related narrative disclosures. Employing a short window event study methodology, the authors use excess stock returns as the dependent variable in their regression model. Using additional narrative disclosures, analyst forecast errors, and changes in fourth-quarter earnings (to control for earnings surprises) as independent variables, HHR find the additional narrative disclosures to be highly significant. They believe their results suggest the presence of information content in the additional narrative disclosures beyond that contained in the other independent variables. Although the authors find a statistically significant association between additional narrative disclosures and excess stock returns, they believe additional research is needed due to the low explanatory power of their regression model.

Landsman and Maydew (2002), and Francis, Schipper, and Vincent (2002a) each document that the information content of quarterly earnings announcements has increased in recent decades. However, both studies provide no explanation for what drives their results. Francis, Schipper, and Vincent (2002b) (here after FSVb) examine three competing explanations as to why the usefulness (information content) of earnings announcements increased over the period from 1980 through 1999. The first two explanations examined by Francis et al. deal with investor reactions to unexpected earnings. Those explanations are rejected. The third explanation deals with the expansion in the amount of concurrent information disclosed in firm's earnings announcements.

The authors find that earnings announcements during the twenty year sample period, in addition to including “bottom line” earnings, included increasing amounts of other concurrent disclosures. The “other concurrent disclosures” identified by the authors include income statements and other financial data as well as disclosures that provide current and forward-looking non-earnings information (narrative disclosures). FSVb, much the same as HHR, conclude that the expanded concurrent disclosures in earnings announcement press releases explain the increase in the information content of earnings announcements that occurred over the twenty year period they examined.

Of greater interest and relevance to this current study is the work of Elaine Henry (2005). In her study, Henry seeks to understand whether investors are influenced by the way earnings press releases are written (i.e. by the linguistic tone and other stylistic attributes). Because the earnings press release is an important method by which firms communicate directly to investors about their performance, Henry believes the answer to her question is a part of the explanation of why markets react to earnings announcements. She defines linguistic tone as the “feeling” of the communication resulting from both the content (subject matter) of the narrative disclosures and the words chosen by the managers who wrote the release. Henry began from the premise that investor understanding of narrative communication is heavily influenced by the content of the narrative, i.e. did the firm experience operating profits or losses, etc.? She further postulates that investor understanding is also influenced by the tone of

the narrative. Tone is engendered by focusing the communication on positive outcomes or by describing outcomes using the most positive words even when the event being discussed does not have a positive result. She notes that officer comments in press releases are particularly successful in conveying positive (or negative) comments about future firm performance. In her work, Henry notes previous research which examines annual report narratives and finds that the tone of corporate narrative communication is affected by specific word choice. Investors are influenced by upward directional words such as “increase” and “up” as well as negative words.

In addition to considering the tone of the earnings announcement and its effect upon investor reaction to the announcement, Henry also considers other elements such as the length of the announcement (quantity of disclosure), the textual complexity (readability) of the communication, the amount of quantitative information included in the announcement, and the level of investor sophistication. Previous to Henry’s work, linguistic tone was often determined, for research purposes, by using a judgmental assessment (i.e. human judgment). Henry’s research uses computer-based analysis that creates a numerical measure of tone based on a frequency count of positive and negative words. Diction 5.0 software is utilized for her computer analysis. The same software, Diction 5.0, is used in this current study.

In her short-window event study, Henry uses cumulative abnormal return (CAR) as the dependent variable. She finds that linguistic tone has a statistically

significant effect upon market reaction to earnings announcements. Additional analysis that includes tone as well as the other stylistic elements mentioned above finds that tone retains its significant effect upon market reactions. However, all of the other stylistic elements have no significant effect upon investor reactions to earnings announcements.

Davis, Piger, and Sedor (2007) (here after DPS) examine two separate questions. First, do managers use linguistic style (optimistic and pessimistic tone) in earnings press releases to provide information to the market about their (the managers) expectations concerning the future performance of the firm. Second, they consider whether the market responds to the optimistic and pessimistic information contained in the tone of the disclosures. Like Henry (2005), DPS uses textual-analysis software, Diction 5.0, to develop a measure of the optimistic and pessimistic tone of their sample press releases. However, unlike Henry, who used combined measures of linguistic tone, DPS chose to develop separate measures for optimistic and pessimistic tone.

To test their first question, DPS create a baseline multivariate regression model that tests for the association between the dependent variable, future return on firm assets (ROA) (i.e. future firm performance), and a lengthy list of independent variables designed to either capture the effect on current performance, the effect upon future performance, or to control for non-financial measures that can impact current and future performance. The list of independent variables includes the natural log of current period revenue,

unexpected earnings, whether or not the firm's current period earnings equal or exceed analyst consensus expected earnings, whether or not the firm experienced a loss in earnings, the firm's profit margin and its asset turnover ratio (components of ROA), a risk proxy (total firm liabilities), and the firm's book to market ratio. To test whether linguistic tone is predictive of future firm performance, DPS add variables for optimistic and pessimistic tone to the baseline equation. With respect to their first question, DPS finds that managers do use optimistic and pessimistic linguistic tone in earnings press releases in order to provide additional, useful information to investors.

DPS' second question is, does the market respond to the linguistic tone included in the earnings announcement disclosures? To test their second question, DPS estimates a multivariate regression model in which cumulative abnormal return (CAR) over the three day period surrounding the earnings release date is regressed on the optimistic and pessimistic tone measures. As in their first regression model, DPS use a number of control variables known to have information content or to control for non-financial elements which affect narrative disclosures. With respect to their second question, DPS finds that investors do respond to manager's use of linguistic tone as a "voluntary disclosure mechanism," (i.e. the market price of the stock is affected).

Other research in which the primary interest is the information content of the periodic earnings announcement includes Francis, Philbrick and Schipper (1994). They examine market reaction to adverse earnings announcements and

find no evidence of market returns on the day of the announcement being associated with the tone of press coverage of the firm in the year prior to the adverse announcement. Henry (2006) finds that including verbal variables (tone, etc.) improves the accuracy of tree-based algorithms in predicting market returns on earnings announcement day. Collins, Li, and Xie (2005), search for a competing explanation to Francis et al. (2002b) for the increase in value relevant information contained in earnings announcements over time. Collins et al. find that the inclusion of cash flow information is the more plausible explanation than Francis et.al. Francis et al. previously concluded that the inclusion of additional financial information such as a complete income statement explained the earnings announcement information level changes over time.

The body of research literature dealing with the value-relevance of periodic earnings announcements has increased in the last ten years. It is noteworthy that, with the introduction of the work of Elaine Henry and of Davis, Piger, and Sedor, research in this area has begun to consider the effect of language choices made by managers as the source of useful information.

2.1.2.3 Management Discussion & Analysis

In recent years, research that examines MD&A has generally used a content analysis approach to assess the association between management's narrative disclosures and financial performance. Tennyson, Ingram, and Dugan (1990) (hereafter TID) examine whether there is an association between the MD&A and the president's letter and financial distress of the firm. TID matched

a sample of companies that declared bankruptcy in 1980 with firms in similar industries and of similar size that did not declare bankruptcy in that year. The sample firms' MD&A and president's letter from two years earlier are used to develop factor scores by way of a thematic analysis of the firm's narrative disclosures. TID use computer analysis software called WORDS to achieve the content analysis. Content analysis in this research consists of the development of a list of the primary themes of the narrative disclosures and a frequency count of the number of times each theme was mentioned in order to develop a quantitative content factor. TID use the content factors as well as financial ratios as independent variables in a multivariate regression to successfully classify bankrupt or non-bankrupt firms approximately 70% of the time. The authors conclude that the MD&A and president's letter have incremental explanatory information beyond that of the financial ratios.

Bryan (1997) examines MD&A content based upon the specific information required by SEC regulations to be included therein. See Section 2.2 for a discussion of SEC requirements for the subject matter to be included in the MD&A. The author identifies seven general disclosures required by the SEC:

1. information on selling price changes (PRICE),
2. information on sales volume changes (VOLUME),
3. reasons for revenue changes other than from price or volume (REVENUE),
4. reasons for cost changes (COST),
5. assessment of the firm's future liquidity position (LIQUIDITY),
6. planned capital expenditures (CAPITAL), and
7. information on known trends affecting (1)-(4) above (FUTURE).

The information, as presented in the MD&A, is generally qualitative. Each disclosure is measured through content analysis and classified as favorable, neutral, unfavorable, or missing. The classified measurements for the seven required disclosures are the independent variables in the tests of MD&A content. Content analysis of each sample firm's MD&A is completed to secure a frequency distribution of the number of favorable, unfavorable, neutral, and missing disclosures for each of the seven independent variables.

As dependent variables for a logit regression, Bryan chose the following four statistics:

1. Direction of Change in Future Sales (Δ SALES),
2. Direction of Change in Future EPS (Δ EPS),
3. Direction of Change in Future Operating Cash Flows (Δ CFO), and
4. Direction of Change in Future Capital Expenditures (Δ CAPEX).

The author measures the direction of the change in each dependent variable for the three years following the study year in order to determine whether the disclosures are associated with both short-term and longer-term results. The regression model includes the independent variables noted earlier as well as certain financial ratios as control variables (similar to Ou and Penman, 1989a).

Bryan's results for this portion of his study are mixed in as much as only one to three of the independent variables are associated with Δ SALES, Δ EPS, and Δ CAPEX in the first year following the sample year. However, there is no association of any of the independent variables with Δ CFO in either the next year or the two succeeding years.

A second purpose of the Bryan study is to examine the association between the MD&A disclosure types (independent variables) and stock returns. Using short-term and long-term event study methodology, he finds that, of the seven MD&A disclosures used as independent variables, only CAPITAL (planned capital expenditures) is significantly associated with both short and long-term returns. None of the other variables is significantly associated with stock returns for any period.

This study presents interesting results with respect to the usefulness of the information contained in the MD&A. The results suggest that certain MD&A variables are positively and significantly associated with one-period ahead changes in sales, earnings per share, and capital expenditures, but not operating cash flows. Bryan finds no significant longer term associations between MD&A disclosures and any financial statistics. The results of the test for a relation between MD&A disclosure variables and stock returns suggests that only capital expenditures are associated with near and longer term returns after controlling for financial statement information.

Using a thematic content analysis approach similar to Bryan (1997), Callahan and Smith (2004) also analyze the narrative disclosures of the MD&A. Disclosures containing information relevant to the assessment of future firm performance are classified as favorable, unfavorable, or undetermined. In their study, a favorable classification is defined as being likely to improve net income or increase net assets. An item is considered unfavorable if the opposite effect

from favorable is expected based upon the disclosure. The item is considered undetermined if the impact on future performance is unclear. Using a frequency approach, the favorable/unfavorable observations about MD&A disclosures are developed into numeric measures of content. Callahan and Smith chose to limit their examination to 71 firms in four industries: airlines, banking, pharmaceuticals and electronics manufacturing. The authors find that MD&A disclosures provide incremental explanatory power in predicting future firm performance and market valuation while controlling for current income and other related factors. It is important to note that Callahan and Smith find that their results do vary between the four industries included in the study.

Rutherford (2005) also uses a content analysis approach to study management disclosures. However, rather than using a thematic approach, Rutherford uses word frequencies as the tool of analysis on the Operating and Financial Review (the OFR) of UK firms (OFR is the equivalent of the MD&A in the United States). The author first performs a word frequency analysis on the OFR's of sample firms and then manually assigned a positive or negative classification to a reduced list of approximately 100 relevant words. From the sample of 68 firms, five pair wise comparisons are made by matching the following types of firms: (a) loss-making versus least profitable, (b) least profitable versus most profitable, (c) loss-making versus most profitable, (d) smallest versus largest, and (e) least leveraged versus highest leveraged.

Rutherford finds the frequencies of positively and negatively charged words are consistent with the “Pollyanna effect”. The Pollyanna hypothesis (see Hildebrandt and Snyder, 1981) suggests that positive or affirmative words are used more often than negative words in narrative texts. The Pollyanna effect, therefore, is the process in which individuals attempt to control the impressions others form of them by using more positive than negative words in narrative texts. Rutherford finds the result regarding the Pollyanna effect interesting in as much as the OFR, like the MD&A, is produced “under the influence of authoritative guidance.” Although the Pollyanna effect occurs in almost all of his sample, Rutherford finds that the effect is greatest in poorly performing firms.

Yuthas, Rogers, and Dillard (2002) use a thematic approach to explore another aspect of the content of management’s narrative disclosures in the annual report (both the president’s letter and the MD&A). Their work examines the ethical characteristics (comprehensive, truthful, sincere, and legitimate) of the narrative disclosures of the annual report. Managers whose narratives are deemed to be ethical are said to be engaging in communicative actions. However, managers are deemed to be performing unethically when their narrative disclosures are found to be less than comprehensive, truthful, sincere, and legitimate. Such unethical behavior is said to be strategic action. Strategic action, in other words, is defined as attempting to influence or alter the perception of information users despite the actual nature of the information being communicated. To achieve the systematic analysis needed to determine the

levels of the communication norms (comprehensibility, truthfulness, sincerity, and legitimacy), the authors use the Diction 5.0 software package.

The authors' sample consists of calendar year (calendar year 2000) firms that have significant negative or positive earnings surprises or no earnings surprises in the first quarter of 2001. First quarter earnings announcements occurred within a few weeks of the release of the prior year (2000) annual report. The primary research question of this study is whether firms that have both the incentive (negative earnings surprise) and opportunity (year 2000 annual report narrative disclosures) would attempt to use strategic communication in the annual report. The authors' expectation, in the case of negative surprise firms, is that the manager's annual report narratives will exhibit more characteristics of strategic action and less of communicative action.

Yuthas, et al. were surprised to find that both the negative and positive surprise firms exhibit more communicative action than did the firms with no surprise (neutral firms). Noting that both the negative and positive firms missed their earnings projections, the authors suggest their findings may represent an effort on the part of both groups of managers to communicate something about their own credibility to investors along with information about the firm. This study is one of the first studies to use computer assisted content analysis to examine the semantic content of the MD&A.

In addition to content analysis, a second area of focus for MD&A research is its readability or understandability. Schroeder and Gibson (1990) (here after

SG) examine the readability of the MD&A. They define readability as “that quality in writing which results in quick and easy communication. Readable writing communicates precisely---and with a single reading.” The authors point out that a significant stream of previous research created a strong foundation for the fundamental premise that readability reflects understandability. In their study, SG compares the readability of the MD&A to that of the president’s letter and financial statement footnotes. To assess the quality of the narratives, SG use three aspects of writing known to affect readability; use of the passive voice, word length, and sentence length.

According to the authors, sentences are strongest when the verb is in the active voice. Narrative written in passive voice is drier, less forceful, and less interesting. Word length affects readability because short words communicate better than do long words. With respect to sentence length, previous research suggests that longer sentences make a narrative more difficult to understand. The authors develop a numerical index of the foregoing elements to assess and compare the readability of the MD&A, the president’s letter, and statement footnotes.

Because both the MD&A and president’s letter allow flexibility in style and presentation, SG expect similar levels of understandability in those documents with less understandability associated with footnotes. However, their findings indicate that the understandability of the MD&A’s were more like those of

financial statement footnotes than the president's letter suggesting that the MD&A lacks the readability of the president letter.

Li (2006) examines whether the readability of the annual report (taken as a whole) is associated with the firm's current and future performance. Readability, as employed by Li, involves the number of syllables per word, the number of words per sentence, and the overall length of the annual report affects its readability. Specifically, the longer the words, the longer the sentences, and the longer the document, the more difficult the report is to read. Reports that are less readable are expected to be associated with lower current earnings and less persistence of future earnings. As expected Li finds that less readable annual reports are associated with lower current earnings and lower or less persistence future earnings performance. Li's findings are somewhat at odds with those of Henry (2005) who finds no association between the stylistic (readability) elements and investor reactions to earnings announcements.

Other research that focuses upon the narrative disclosures of the MD&A includes the work of Barron, Kile, and O'Keefe (1999) who test for an association between the properties of analyst's forecasts and the quality of MD&A disclosures. Clarkson, Kao, and Richardson (1999) present support for the usefulness and quality of MD&A. They further suggest that MD&A disclosures are a part of the firm's overall communication strategy. Callahan and Smith (2005) examine the quality of MD&A disclosures to determine whether they are adequately transparent to provide information needed by investors to assess the

firm's financial condition and future performance prospects. Holder-Webb (2007) develops a quantitative tool to objectively evaluate the quality of the narrative disclosures of the MD&A. Holder-Webb's statistical measure of the quality of MD&A disclosures is based upon a thematic analysis of the contents of the disclosures rather than the semantics of their presentation. Holder-Webb and Cohen (2007) examine the quality of the MD&A disclosures of firms entering financial distress. They find that firms increase disclosure quality in the initial year of distress.

2.1.2.4 Other Narrative Disclosure Research

In addition to the research literature discussed in the preceding sections, there is a growing stream of work that uses a number of different approaches for the analysis of corporate narrative disclosures. Rogers and Grant (1997), for example, assess the relevance of information provided in the entire annual report by examining a sample of 187 sell-side analyst reports. They used thematic content analysis of all of the analyst reports to identify the types of information used by the analysts. The authors then examine the full text of all narrative disclosures included in the annual report (president's letter, MD&A, and footnotes). They find that the MD&A provides the largest proportion of annual report information cited by analysts (greater than the president's letter and the firm's financial statements).

Mercer (2004) examines the accumulated research work on the how investors assess the credibility of management disclosures. Frost (1997)

examines the disclosure choices made by the management of 81 UK firms after receiving modified audit reports due to accounting and auditing deficiencies.

2.1.2.5 Summary of Qualitative Disclosure Research Findings

The importance of the narrative portions of the president's letter, periodic earnings announcements, and the MD&A have been well documented. It has been shown consistently that managers use the content of these narrative disclosures as a means of providing useful information to investors. However, besides Henry (2005) and Davis, Piger and Sedor (2007), few studies have considered the language and tone that managers use in their narrative disclosures. Further, to date, no research using a linguistic style or tone approach upon the MD&A has been published.

2.2 Management Discussion & Analysis

2.2.1 History & Current Regulatory Environment

Section 13 of the Securities Exchange Act of 1934 requires any issuer of a publicly registered security to file an annual report in the form and under such regulations as the SEC may prescribe. In general, the annual report covers the activities of the firm for the preceding year. The SEC, in Regulation S-K, Subpart 300, Item 303, requires "management's discussion and analysis of financial condition and results of operations" (MD&A) be included the annual report as required by the 1934 Act. Current MD&A disclosures are related to a "summary of earnings" required in registration statements beginning in 1968. The summary of earnings was also required to include an update of any unusual

circumstances that would have an adverse effect on the financial information presented. (SEC, 1968)

In 1974 the SEC amended its reporting requirement to include a narrative explanation and analysis of 1) the summary of earnings, 2) material changes in revenue and expense items, and 3) the effect of material changes in accounting principles or practices. These disclosures were referred to as “management analysis”. (SEC, 1974) The current framework of MD&A was adopted in 1980 (SEC, 1980). The 1980 adjustments to MD&A require a more comprehensive discussion of the financial statements as a whole. Specifically, Regulation S-K was altered to require that management’s analysis cover matters related to the liquidity, the capital resources, and the operating results of the firm.

With respect to liquidity, management must discuss trends or known demands, commitments, or uncertainties that have resulted or may result in material changes in the liquidity of the firm. If a deficiency in liquidity is noted, management is required to discuss its intentions regarding a proposed remedy for the deficiency.

Capital expenditure commitments must be identified in the analysis. Management must discuss the general purpose of the commitments as well as the sources of funds anticipated to provide for the fulfillment of the commitments. Further, management must discuss trends, favorable and unfavorable, regarding its capital resources. It must include information concerning any changes

management expects to make in its capital structure (i.e. its mix of equity, debt, and off-balance sheet financing arrangements) in future periods.

Regulation S-K also requires that management describe any unusual occurrences or transactions which materially effected the net income from continuing operations of the reporting period. They must specifically discuss the causes of material changes in revenue or cost of goods sold as well as other operating expenses. Additionally, if the firm has experienced or expects to experience events that will cause a material change in the revenue or expenses of the firm, information about such changes or events must be disclosed.

Since the current broadly structured form of MD&A disclosure requirements was adopted in 1980 (SEC, 1980), the SEC has announced ten additional releases intended to provide direction for the preparation of the MD&A. See Appendix A for a comprehensive listing of SEC releases with respect to MD&A. Perhaps the most important of the releases are two interpretive releases announced in 1989 and 2003 (SEC, 1989; and SEC, 2003).

Hufner (2007) noted that:

Both releases [SEC, 1989 & 2003] interpret the central MD&A-specific rules according to Reg. S-K Item 303 from the SEC's perspective, and provide registrants with interpretive guidance in the case of those MD&A requirements that need to be put into more concrete terms.

Hufner's extensive discussion regarding the instruction and guidance offered to public firms highlights the fact that the SEC focus is upon two primary areas. First, all of the SEC releases focus predominantly upon the specifics of the

content or subjects expected to be discussed in the MD&A. Secondly, in more recent years, the Commission has emphasized writing style (length of words and complexity of sentences used, etc.) and clarity of data presentation in an effort to encourage more readable and understandable disclosures in the MD&A. With respect to this current study, the SEC, in its guidance to publicly held firms regarding the MD&A, sets forth no requirements with respect to specific word choice or linguistic style and tone that should or should not be used in management's disclosures.

The intent of the management analysis as required by Regulation S-K and its related interpretive releases is to provide investors and other financial information users with information that will enhance the user's understanding of the firm's financial condition, anticipated changes in its financial condition, as well as the results of its operations. The disclosure requirements and extensive guidance provided for MD&A make it clear that the position of the SEC is to ensure that management disclosures must be clear, readable, and understandable thereby making them of value to investors.

2.2.2 Choice of MD&A for This Study

Statements like "Management's discussion and analysis (MD&A) is arguably the most read and most important component of the financial section" (Tavcar, 1998) suggest that the MD&A has very significant importance to investors and other financial information users. Much of the information used to

prepare the MD&A has its origin in the audited financial statements of the firm.

Hufner (2007) points out that:

It is not mandatory for companies to have their MD&A reports audited.[however] auditors have a professional responsibility,to check a company's MD&A information for material inconsistencies against the respective financial statements of that company.

The SEC's enforcement measures aim for a higher degree of credibility of MD&A information.MD&A's that are filed with the SEC are regularly reviewed by the Division of Corporation Finance.

It cannot be over emphasized that the SEC exposes MD&A's to very rigorous review and oversight procedures. The SEC investigates MD&A's to insure that firms have complied with the spirit and letter of the disclosure requirements as to events that materially impact both historical results and prospective disclosures.

Neither the president's letter nor the periodic earnings announcements of a firm are the subject of disclosure requirements or are exposed to the level of scrutiny that are as rigorous as those applied to the MD&A. In fact, the president's letter and earnings announcements are subject to no disclosure requirements. The president's letter, as noted previously in the discussion of Abrahamson and Amir (1996) and others, has historically been perceived to be a carefully crafted public relations document with few restrictions and little, if any, significant content.

MD&A, on the other hand, is subject to a significant level of SEC mandated disclosures. In fact the SEC has spent four decades increasing and refining the disclosures required in MD&A with the express purpose of making

the document a reflection of future firm expectations as seen through the eyes of its managers. Further, the SEC seeks to ensure the credibility of the MD&A through on-going enforcement activities aimed at making sure that management's maintain the quality and credibility of their disclosures. Additionally, the supporting data from which many of the MD&A disclosures originate comes from the firm's financial statements which are audited and attested to by independent outside auditors.

Given the foregoing, all of which is designed to ensure that MD&A disclosures are useful and credible, it seems reasonable to suggest that investors do find these disclosures provide incrementally useful information about a firm. More importantly, because the president's letter and periodic earnings announcements do not achieve the same level of credibility as does the MD&A, it is reasonable to suggest that investors may value the information derived from MD&A more highly than that of the other two communication vehicles.

This study appears to be the first to attempt to demonstrate that manager's linguistic style, as reflected in the MD&A, is associated with future firm performance as well as a near and long-term market stock price response. Therefore, this study has the potential to add important new information about a very important communication tool used by firm managements.

There are certainly future research opportunities with respect to the question of which communication vehicle is the source of greater incremental

information from linguistic tone and style. However, because no previous research has been identified that examines the information content of the linguistic tone and style of MD&A disclosures, that document has been chosen for this study.

CHAPTER 3

THEORY, HYPOTHESIS DEVELOPMENT AND RESEARCH METHODOLOGY

3.1 Theoretical Basis

Language, both written and spoken, is a form of symbolic behavior and is used to convey the thoughts of the author or speaker. Language use conveys information beyond the literal meaning of the words by way of the tone or general impression engendered by the communication (Pennebaker, Mehl, and Niederhoffer, 2003). Tone can be a function of both content as well as word choice. Thus, a positive tone can be achieved by focusing on positive events or outcomes (content) and/or by describing events in a positive way (word choice). Rutherford (2005) examines annual report narratives and finds that words that suggest an upward direction such as “increase” and “up” are observed more frequently than words that suggest a downward direction. Rutherford suggests that language is generally biased toward the positive. Abrahamson and Amir (1996) find that negative words in the president’s letter are associated with poor market returns while Smith and Taffler (2005) find an association between negative words and firm bankruptcy. Linguistic analysis does not simply emphasize the literal meanings of words included in a narrative rather it must also examine the way words are used. Words which are emphasized or ignored can indicate a particular position or frame of mind of the

communicator on matters to which the words relate. Other than tone, there are a number of other stylistic elements of language (such as length and complexity of the narrative, length and complexity of the words used in the narrative, numerical intensity, etc.) that have been the subject of recent research (see Chapter 2). However, linguistic tone is the focus of this current study.

The work of Chung and Pennebaker (2007) suggests that the tone and emotion connoted by the words used in narrative prose are as important as the literal meaning of the words that make up the phrases and sentences. The manner in which the words chosen for a narrative are used can send information signals to the receiver of the communication. We can, therefore, consider language word choices as a form of managerial signaling. Since word choices are observable acts, it is reasonable to assume that linguistic analysis will enable a researcher to draw inferences from narrative disclosures regarding the expectation of managers and their effect upon the investor. Some of the research discussed in Chapter 2 suggests that accounting researchers have begun to consider language use as a viable source of insight into the beliefs managers hold about the future of their firms. If management's true expectations about the future performance of the firm are embodied in the narrative comments of the annual report, it follows that the information contained in those narrative comments should be useful in the prediction of the firm's future performance. The purpose of this study is to examine the concept

of MD&A word choices as management information signals and the use of those signals by investors for the prediction of future firm performance.

3.2 Linguistic Tone in the Prediction of Future Performance

Linguistic tone, as defined in this study, is the feeling engendered by a narrative communication. Tone is a function of both the content or literal meaning of the words and phrases of the communication as well as the effect of the words that are chosen for the communication (Henry, 2005). Chapter 2 contains a discussion of a number of studies that investigate the thematic content of management's narratives as being the source of useful information for investors. The thematic studies reviewed included McConnell, Haslem, and Gibson (1986), Kohut and Segars (1992), Tennyson, Ingram, and Dugan (1990), Smith and Taffler (1999), Rogers and Grant (1997), Francis, Schipper, and Vincent (2002b), Hoskin, Hughes, and Ricks (1986), Collins, Li, and Xie (2005), Bryan (1997), and Yuthas, Rogers, and Dillard (2002).

Chapter 2 also included a review of several studies whose primary focus was the tone created by the content of management's annual report narratives. The studies in this second category included Abrahamson and Park (1994), Smith and Taffler (1999), and Callahan and Smith (2004).

Finally, in Chapter 2 several studies were reviewed in which the focus was the examination of the linguistic tone of annual report narrative comments that resulted from the word choices made by managers. Those studies

included Abrahamson and Amir (1996), Henry (2005), Davis, Piger, and Sedor (2007), Henry (2006), Rutherford (2005), and Li (2006).

In the majority of the studies listed in the three preceding paragraphs, the authors seek to assess the information level of management narrative comments with a methodology that associates the information content (usefulness) of the narratives with the future performance of the firm or with its future stock price. In the work of Abrahamson and Amir (1996), Henry (2005), Davis Piger, and Sedor (2007), and Henry (2006) the primary focus is the tone created by word choices of managers in their narratives and their association with future firm performance or stock price. The aforementioned studies, having identified an association between the tone of narrative comments and future firm performance, established and supported the premise that there is a link between linguistic tone and the prediction of future firm performance. This study will extend the foregoing work by applying the same concept to the management narratives of the MD&A which has not previously been analyzed by using word analysis to determine linguistic tone.

This study proposes that the linguistic tone of MD&A contains value-relevant information incremental to its content or subject matter. Specifically, it is expected that MD&A disclosures will display positive (optimistic) and negative (pessimistic) tone which will vary as to the levels of optimism and pessimism across firms and over time. This study's focus on optimistic and pessimistic tone of the language of the MD&A is consistent with social communications

theory as discussed by Chung and Pennebaker (2007), who suggest that message recipients are attentive to both the content as well as the linguistic tone which messages contain. Therefore, this study predicts that managers use optimistic (pessimistic) tone in the MD&A to communicate positive (negative) signals to investors about their (the manager's) expectations of future firm performance. My first set of hypotheses:

H1a: The level of optimistic tone in a firm's MD&A is positively associated with positive future firm performance.

H1b: The level of pessimistic tone in a firm's MD&A is negatively associated with negative future firm performance.

The first set of hypotheses is based upon the assumption that managers use linguistic tone to communicate truthful, useful information to investors. Given the discussion earlier in Section 2.2 regarding SEC disclosure requirements for the MD&A as well as the high level of SEC oversight applied to MD&A, it is reasonable to assume that managers are sufficiently incentivized to make truthful disclosures in their commentaries.

3.3 Short-run Market Response to MD&A Linguistic Tone

The work of Ajinkya and Gift (1984) is based primarily upon two hypotheses. First, managers issue forecasts in order to move market expectations toward management's own beliefs about the firm's future performance, (i.e. to remove information asymmetry between managers and investors). Second, based upon management's signal (Hypotheses H1a & b), investors revise their expectations of future firm performance and thus change

the market price of the firm's stock. Ajinkya and Gift suggest that a "good news" forecast is associated with an upward stock price revision and a "bad news" forecast with a downward revision. As a result of their work, the authors of this study find support for their two hypotheses.

Though not original to Ajinkya and Gift, the two foregoing hypotheses are the foundational support for capital market research methods. If an event provides investors with information that is incremental and value-relevant, then, based upon the efficient market hypothesis, one should observe a change in the price of a firm's stock. Optimistic or positive information should cause a positive change in stock price while pessimistic or negative information will cause a negative stock price change.

Based upon the expectations-adjustment hypothesis of Ajinkya and Gift, this study suggests that, in the preparation of the MD&A, managers use positive and negative linguistic tone to align investor expectations of future firm performance with their own (H1) thus providing incremental useful information to investors. Further, if investors believe that managers use linguistic tone to communicate truthful expectations of future firm performance, a market response to these disclosures can be expected. Such a market response to manager's linguistic tone is consistent with previous research examining market reaction to other management disclosures. Consequently, H2 suggests the following:

H2a: The level of optimistic tone in a firm's MD&A is positively associated with positive market returns around the MD&A release date.

H2b: The level of pessimistic tone in a firm's MD&A is negatively associated with negative market returns around the MD&A release date.

As with H1, H2 is based upon the assumption that managers use linguistic tone to communicate truthful, useful information to investors. Further, it is implicit in H2 that investors perceive the credibility and usefulness of the information. As discussed in Section 2.2 and 3.2, the MD&A is believed to be the product of an environment which provides the necessary credibility to investors.

3.4 Long-run Market Response to MD&A Linguistic Tone

Given that managers use linguistic tone in MD&A to convey information about their (the manager's) expectations for future firm performance (H1), and given that investors perceive the information to be useful and cause a reaction to the firm's stock price as a result of the incremental information (H2), there remains an unanswered question. It is still unclear as to whether the information delivered by management and acted upon by investors has merit with regard to the prediction of future firm performance. Management thinks that its firm will perform well (poorly) in future periods. Investors understand the signal, believe that it has credibility, and act upon it causing the stock price to react in the time period around the MD&A release date. The remaining question to consider is whether or not the manager's beliefs about their firm

were correct. This remaining question has clear implications with respect to investment decision making.

Given the associations predicted in H1 and H2, and given that managers use linguistic tone to provide truthful information to investors, this study predicts that the linguistic tone projected by managers in the preparation of MD&A narrative comments has value in the prediction of future firm performance. Therefore, this study suggests the following:

H3a: The level of optimistic tone in a firm's MD&A is positively associated with positive market returns for the 12 and 24 month periods subsequent to MD&A release date.

H3b: The level of pessimistic tone in a firm's MD&A is negatively associated with negative market returns for the 12 and 24 month periods subsequent to MD&A release date.

3.5 Research Methodology

This portion of Chapter 3 presents the research methodology used in the study. The development of measurement metrics for optimistic and pessimistic tone is discussed first in Chapter 3. The methodology used to test and analyze each of the three hypotheses will then be discussed including the specification of the dependent, independent, and control variables. The final section will be a discussion of the characteristics and criteria used for the selection of the sample for this study.

3.5.1 Diction 5.0

This study develops a numeric measurement metric for the optimistic/positive and pessimistic/negative linguistic tone of the narrative

comments of the MD&A. The index of positive and negative tone will become an element in the regression analysis of each of the hypotheses of this study. A numeric metric, as opposed to a judgmentally based measure, will facilitate the replication and extension of this research.

The tonal measure for all of the hypotheses of this study are based upon a count of the optimistic and pessimistic words contained in each sample MD&A. The counts are obtained using textual analysis software, Diction 5.0. For additional discussion about the Diction 5.0 platform, see Appendix A. To review the list of Diction 5.0 dictionaries of positive and negative words, see Appendix B. To review a custom list of positive and negative words consistent with the tonal analysis performed in Henry (2006), see Appendix C.

As noted above, linguistic tone is measured by the Diction 5.0 frequency count of positive and negative words in the MD&A of sample firms. For each sample firm MD&A, OPT is the percentage of positive words found in the text by Diction 5.0. PESS is the percentage of negative words found in the sample firm MD&A text. The denominator of each percentage calculation is the total number of words in the MD&A text. OPT and PESS are the primary measures used to test each of this study's hypotheses. For purposes of this study, a measure of tone will be developed using the six dictionaries contained in Diction 5.0. Three of the dictionaries contain positive or optimistic words and the other three negative or pessimistic words (See Appendix B). This methodology is consistent with Davis, Piger, and Sedor (2007) and should yield comparable

results. A second measure of tone will also be developed using a custom dictionary of terms developed by Henry (2006) (See Appendix C). It is not anticipated that the tonal measures will be significantly different.

This measure of linguistic tone is simple but is similar to tone measures used successfully in previous research. Abrahamson and Amir (1996) analyzed the president's letter using frequency counts of negative words. Davis, Piger, and Sedor (2007) used Diction 5.0 word frequency counts of optimistic and pessimistic words to assess the information contained in earnings press releases. Likewise, Henry (2006) used Diction 5.0 word frequency counts of optimistic and pessimistic words to determine a net positive/negative tonal measure in order to assess the information content of earnings press releases. Smith and Taffler (2000) analyze president's letters using frequency counts to develop word (not tone) and theme-based measurements that were associated with firm bankruptcy. Though this approach is in the early stages of use in business research, word frequency methodology has been shown to be a useful tool.

3.5.2 Methodology for H1—Predicting Future Performance

Hypothesis H1a suggests that the level of optimistic tone in a firm's MD&A is positively associated with its future performance. Alternatively, hypothesis H1b suggests that the level of pessimistic tone in a firm's MD&A is negatively associated with its future performance. To test these hypotheses, the levels of optimism and pessimism in the MD&A are examined to determine

if they are associated with the firm's future performance. In a fashion similar to Core, Holthausen, and Larker (1999) and Bowen, Rajgopal, and Venkatachalam (2007), this study uses a baseline multivariate regression model to explain future firm performance based upon the quantitative information provided in the firm annual report (including the MD&A). FUTROA (future firm performance) is measured as the ROA (return on assets) of the firm for the fiscal year following the sample year. The following baseline model is used to explain future firm performance based upon the quantitative information provided in the annual report (including the MD&A):

$$\text{FUTROA}_i = \beta_0 + \beta_1\text{ROA}_i + \beta_2\text{PM}_i + \beta_3\text{AT}_i + \beta_4\text{DA}_i + \beta_5\text{BM}_i + \beta_6\Delta\text{REV}_i + \varepsilon_i \quad (1)$$

Where:

- ROA_i = sample year return on assets
- PM_i = profit margin (sample period net operating income divided by revenue)
- AT_i = asset turnover (revenue divided by total end of yr assets)
- DA_i = sample period total liabilities divided by total assets
- BM_i = sample year book value of equity divided market value of equity.
- ΔREV = percent change in revenue between the sample period and the previous period.

The independent variables included in the baseline model will serve as control variables in the follow-up model (Equation 2) into which the tonal index variables will be inserted. Not including the control variables in Equation 1 could result in information content being erroneously attributed to the tonal index variables.

The firm annual report and its MD&A contain all of the quantitative information available to investors. In an effort to control for the information effect of all of this data, ROA, PM, and AT have been included in Equation 1 to capture the predictive power of current financial performance indicators included in the annual report and MD&A with respect to future firm performance. The variable DA, the ratio of liabilities to total assets, is included to control for firm risk and its effect upon the results of the firm. Finally, the variable BM, the book value to market value ratio, is included as a control for the effect of non-financial performance measures upon future firm performance. This is an additional proxy for the basic or underlying subject of the annual report.

The control variables included in Equation 1 are rooted in fundamental financial analysis concepts. Nissim and Penman (2001), Ou and Penman (1989), Penman (1992), Penman and Zhang (1999) as well as others, through the use of fundamental analysis, have demonstrated the validity of measures such as those included in Equation 1 as sources of information derived from the quantitative information provided in the firm annual report. The control variables included in Equation 1 are similar to those found to be useful by Davis, Piger, and Sedor (2007) and Henry (2006).

In order to test hypotheses H1a and H1b, it is necessary to augment Equation 1 with the positive (OPT) and negative (PESS) tone measurements developed using Diction 5.0. Equation 2 is as follows:

$$\text{FUTROA}_i = \beta_0 + \beta_1\text{ROA}_i + \beta_2\text{PM}_i + \beta_3\text{AT}_i + \beta_4\text{DA}_i + \beta_5\text{BM}_i + \beta_6\Delta\text{REV}_i + \beta_7\text{OPT}_i + \beta_8\text{PESS}_i + \varepsilon_i \quad (2)$$

The effect of Equation 2 is to regress the measurement of future firm performance (FUTROA) on the tonal measurements of OPT and PESS. The null hypothesis of Equation 2 is that OPT and PESS have no predictive value for future firm performance or $\beta_7 = \beta_8 = 0$.

3.5.3 Methodology for H2—Short-run Market Reaction

Hypothesis H2a suggests that the level of optimistic tone in a firm's MD&A is positively associated with market returns around the MD&A release date (filing date of the annual Form 10-K required by the SEC). Further, Hypothesis H2b suggests that the level of pessimistic tone in a firm's MD&A is negatively associated with market returns around the MD&A release date. To test the H2 Hypotheses, market response to the levels of optimism and pessimism in the MD&A is examined. It is known, as a result of previous research, that there is value relevant information contained in the quantitative disclosures of the annual report. Therefore, control variables similar to those included in Equations 1 and 2 are necessary in analyzing the second set of hypotheses as it is focus of this study to isolate the information contained in the narrative text of the MD&A from that contained in the report's quantitative disclosures.

Much of the prior research in information content has used abnormal market returns as the dependent variable. In this context, abnormal returns are

defined as market returns that differ from the expected returns. Cumulative abnormal returns for the 20 day period around the Form 10-K filing date beginning with day t-9 through day t+10 (with day 0 being the date of MD&A filing with the SEC) will be the dependent variable for purposes of testing the H2 hypotheses. In the H2 short-term event study, abnormal returns (CAR) is the accumulated excess return of a sample firm compared to the NYSE equal weighted market return over the event window. See Section 3.5.5 below for a discussion of sample selection. The multivariate regression model for testing H2 is CAR (cumulative abnormal return over the short-term event window) regressed on OPT and PESS. The model is as follows:

$$CAR_i = \beta_0 + \beta_1 ROA_i + \beta_2 UE_i + \beta_3 \ln MV_i + \beta_4 LOSS_i + \beta_5 PM_i + \beta_6 BM_i + \beta_7 OPT_i + \beta_8 PESS_i + \varepsilon_i \quad (3)$$

Where:

ROA_i = sample period return on assets

UE_i = unexpected earnings (current EPS minus prior yr. EPS scaled by the price of a common share at the beg. of the year)

$\ln MV_i$ = natural log of the common equity of the firm (year-end)

$LOSS_i$ = dummy variable; 1 if actual earnings for the sample period are negative; otherwise = 0.

PM_i = profit margin (sample period net operating income divided by revenue)

BM_i = sample year book value of equity divided market value of equity.

In Equation 3 variable DA (sample period total liabilities divided by total assets) is included as a variable in order to control for the effect of market risk as well as the impact of other non-financial measures. Control variables, ROA,

and PM, are included as sources of information derived from the quantitative information provided in the firm's annual report. Additionally, Equation (3) includes the control variables UE and LOSS. These variables are included in order to capture the effect on a firm's stock price of sample period unexpected earnings as well as the market impact of a sample period loss. This methodology is consistent with previous research including Davis, Piger, and Sedor (2007) and Henry (2006). The variable lnMV is the natural log of the common equity of the firm at the end of the sample year. Firm size has been found, in previous research, to have a confounding effect upon test results with respect to stock price returns in samples which include companies of varying sizes. This variable is included in Equation 3 to control for such size effects. Finally, control variable BM, the book value to market value ratio, is included as a control for the effect of non-financial performance measures upon future firm performance. This is an additional proxy for the basic or underlying subject of the annual report.

The effect of Equation 3 is to regress the firm cumulative abnormal stock price returns (CAR) measured during a short event window around the Annual Report filing date on the tonal measurements of OPT and PESS. The null hypothesis in Equation 3 is that there is no market response to the levels of OPT and PESS or $\beta_7 = \beta_8 = 0$.

3.5.4 Methodology for H3—Long-run Market Reaction

Hypothesis H3a suggests that the level of optimistic tone in a firm's MD&A is positively associated with market returns for the 12 and 24 month periods subsequent to the MD&A release date (filing date of the annual Form 10-K with the SEC). Alternatively, hypothesis H3b suggests that the level of pessimistic tone in a firm's MD&A is negatively associated with market returns for the 12 and 24 month periods subsequent to the MD&A filing date. To test these hypotheses, market response to the levels of optimism or pessimism in the MD&A is examined. Tests of hypotheses H3 also utilize an abnormal return methodology. The 12 month long-term event window will be the period from the end of the short-term window event period (Hypothesis 2) through the end of the first quarter of the following calendar year (end Q1, 2004). The 24 month long-term event window will cover the period from the end of the short-term event window and end on the last day of the first quarter of the second calendar year following the MD&A release date (end Q1, 2005).

The cumulative abnormal return (CAR) will be determined for each of the long window periods and will be the dependent variable for each regression test. Equation 4 for these hypothesis tests is the same as that used for the short-term window tests:

$$\begin{aligned} \text{CAR}_i = & \beta_0 + \beta_1\text{ROA}_i + \beta_2\text{UE}_i + \beta_3\ln\text{MV}_i + \beta_4\text{LOSS}_i + \beta_5\text{PM}_i + \beta_6\text{BM}_i + \\ & \beta_7\text{OPT}_i + \beta_8\text{PESS}_i + \varepsilon_i \end{aligned} \quad (4)$$

The effect of Equation 4 is to regress the sample company cumulative abnormal stock price returns (CAR) measured during the 12 and 24 month event windows following the sample year Annual Report filing date on the total measurements of OPT and PESS. The null hypothesis in Equation 4 for both the 12 and 24 month test periods is that there is no market response to the levels of OPT and PESS or $\beta_7 = \beta_8 = 0$.

3.5.5 Sample Selection

Sample sizes in the research reviewed and discussed in Chapter 2 ranged from as few as forty (40) firms to a high of just under 2,000 firms. The average sample size is approximately 100 to 150 firms. The population from which the sample for this study is drawn includes all firms in SIC codes 20xx and 30xx that are listed on the New York Stock Exchange, the American Stock Exchange, and NASDAQ at the beginning of 2002 which use a calendar year and have a share price greater than \$1 at the beginning of 2002. Firms in the SIC codes used in this study are predominantly industrial and manufacturing companies. See Table 1 for a list of the specific industry classifications from which the sample is drawn along with the number of firms drawn from each classification. The use of a sample containing firms that conduct similar types of business will reduce the possibility that the results of this study will be affected by noise that can result from a small, cross industry sample. In as much as the study includes analysis of firms up to two years following the 2002 sample year, any firm not in business for any reason (failure, merger, etc.) at

the end of the two year follow-on period, will be excluded if chosen in the original sample. The excluded companies will be replaced in the sample by the next firm in the rejected firm's decile category (see below for discussion of firm ranking and selection).

The stock price return for the initial population of firms chosen from the three exchanges will be computed for the year 2002. The firms will be sorted into rank order based upon 2002 stock price return. The population will be broken into deciles and the top one hundred firms from deciles 1, 3, 5, 7, and 10 will be selected. Any firm selected in the top one hundred firms of a decile that is found to be in an excluded category (failed, merged, etc) will be replaced by the selection of the next firm in the decile from which the rejected firm was drawn.

This process will yield a sample of 500 firms chosen without regard to firm size. Subsequent research in this area should examine the industry effect of linguistic tone by using a larger sample with no industry restriction or fiscal year restriction. However, examination of the possibility of an industry effect is beyond the scope of this study.

The MD&A from the Form 10-K of each sample company for the firm's fiscal year 2002 will be obtained and passed through the Diction 5.0 software in order to obtain the count of the positive and negative words contained in the text which is necessary for the preparation of the OPT and PESS variables for each firm.

Subsequent to the identification of the 500 firms to be included in the initial sample, any firm found to be missing any required financial data or for which a usable MD&A electronic record cannot be obtained will be eliminated from the sample without replacement.

CHAPTER 4

ANALYSIS OF DATA COLLECTION AND REGRESSION RESULTS

4.1 Data Collection & Sample

Using the methodology described previously in Section 3.5.5, 500 firms were randomly selected to be included in the sample for this study. Once an initial sample was chosen, the financial data needed for each firm for the sample year of 2002 as well as the three subsequent calendar years was obtained using the COMPUSTAT North American Data Base. Any sample firm for which financial data for any of the three years (2003, 2004, & 2005) was not available due to the firm's sale, closure, or merger was replaced in the sample using the procedure described in Section 3.5.5.

Once selection of the 500 sample firms was complete, the MD&A for each firm was obtained in electronic form. To obtain the needed electronic MD&A file, the SEC on-line data base of company filings was utilized. The Form 10-K filing for calendar 2002 for each sample firm was accessed and the MD&A section of the filing obtained. Additionally, the filing date of Form 10-K was obtained from the SEC records for each firm. While extracting electronic MD&A files from the SEC records, it was noted that a number of the sample firms were not domestic (United States domiciled) firms. Firms that are not domestic U.S. firms are not required to file annual reports in the same format as domestic corporations. As a result of not filing Form 10-K, the subject

international companies lacked MD&A comments. Twenty-three (23) such firms were identified and dropped from the sample for the study.

In order to use the Diction 5.0 software to obtain a count of positive and negative words, electronic files containing the MD&A sections from the Form 10-K had to be in a pure text format and be free of all formatting codes. Public firms are required to submit Form 10-K to the SEC electronically. However, there are a significant number of different software platforms that may be used to prepare documents for submission to the SEC. Each such system has formatting codes which are unique to that system and which make the conversion to a pure text form somewhat problematic. It was not possible to convert all of the electronic files obtained from the SEC online database into pure text form (free of all format codes) that would run properly over the Diction 5.0 software platform. It was, therefore, not possible to obtain the necessary word counts from the MD&A's of forty-two (42) firms. The forty-two firms without positive and negative word counts were dropped from the sample.

As noted previously, financial data for each sample firm for the 2002 sample year as well as the three subsequent years was obtained from the COMPUSTAT Data Base. A firm by firm review of the financial data revealed twelve (12) firms that were missing portions of the necessary data that could not be obtained from alternate sources. The twelve firms in question were dropped from the sample.

Unless there are extenuating circumstances, publicly held firms generally announce their annual earnings prior to the filing of Form 10-K. Assuming that the two occurrences are separate events, it is important that the information contained in the earnings announcement be kept separate from that contained in the Form 10-K. In a 1987 Accounting Review paper, Peter Wilson found that 90% of his sample firms had at least eight days separation between the release of annual earnings information and the filing of the Form 10-K. In order to avoid the affect of two confounding events on the cumulative abnormal return achieved during the short event window needed for Hypothesis H2, a review was conducted comparing the sample firm's 2002 annual earnings announcement dates and their subsequent Form 10-K filing dates for that year. Using a minimum separation period of at least eight days (as per Wilson (1987)) between the two events, our review identified no sample firm that failed to have at least the minimum required separation of eight days between the two events.

As a result of the data collection and analysis procedures just discussed, the final sample of firms utilized in this study numbered 423. All of the sample population was drawn from SIC codes beginning with 20xx and 30xx. The companies included in these SIC categories are manufacturing and industrial firms of all types. Table 1 lists the industry groups from which the sample firms were drawn. The 423 firms in the sample came from 20 unique SIC codes. Two hundred ninety-four (294) firms or 70% of the sample came from five of the twenty SIC codes. Three hundred fifty-five (355) firms or 84% of the sample

were drawn from ten of the twenty total SIC codes. As noted in Section 3.5.5., the sample was limited to manufacturing and industrial firms in order to eliminate, to the extent possible, any distortions that could be caused by reporting differences that can arise due to differences in industry reporting styles or customs.

\$4.2 billion is the average total assets of a sample firm. However, median total assets amount to \$236.3 million per firm. The difference between the mean and median total assets suggests that the sample is more heavily weighted with small firms than with large firms. The fact that 67% of sample firms are from the ASE and NASDAQ (see below) exchanges is not surprising in as much as both exchanges are populated with smaller firms when compared to the firms on the NYSE. With sample firms varying in size from \$1.8 million to \$370.8 billion in total assets, there is very wide diversity in firm size. The very wide range in the size of sample firms could pose a problem for this study.

When sample firm revenue and market values were analyzed, the same wide diversity in firm size was found as was noted with total assets. Sample firm revenue has a mean value of \$2.8 billion and a median value of \$186.6 million. Firm revenue ranges from as little as \$90,000 to as much as \$184.2 billion. Likewise sample firm market value has a mean of \$25.6 billion and a median value of \$2.4 billion. The range, however, reflects the smallest firm with a market value of \$40.3 million to a maximum of \$673.7 billion. The foregoing analysis suggests that variables used in this study should be Winsorized in

order to help avoid the undue influence of outliers caused by the wide diversity in the size of sample firms.

The sample is made up of 141 NYSE firms, 49 ASE firms, and 233 NASDAQ firms. The distribution of sample firms between the three exchanges helps explain the very wide range in sample firm statistics as well as the skewed nature of the means and medians of sample firm statistics. NYSE firms tend to be larger, on average, than ASE and NASDAQ firms.

4.2 Incidence of Optimistic and Pessimistic Words

Using the methodology discussed in Section 3.5.1, this study develops a numeric measurement for optimistic and pessimistic linguistic tone found in the narrative comments of the MD&A. The use of a numeric metric developed using a software system, as opposed to the judgmentally derived tonal measures used in much of the prior research on this subject, will facilitate the subsequent replication and extension of this research. The tonal measures for all of the hypotheses of this study are based upon a count of the optimistic and pessimistic words contained in the MD&A of each sample firm. The counts are obtained using textual analysis software, Diction 5.0 (See Appendix A).

Linguistic tone is measured by a Diction 5.0 count of the frequency of positive and negative words in the sample firm MD&A's. For each sample firm, OPT is the percentage of positive words found in the MD&A text by Diction 5.0. PESS is the percentage of negative words found in the text of sample firm MD&A. The denominator of each percentage calculation is the total number of

words in the MD&A text. For purposes of this study, a measure of tone will be developed using six of the dictionaries contained in Diction 5.0. Three of the Diction dictionaries contain positive or optimistic words (dictionary titles are Praise, Satisfaction, and Inspiration) and the other three negative or pessimistic words (dictionary titles are Blame, Hardship, and Denial) (See Appendix B). This methodology is consistent with that used in Davis, Piger, and Sedor (2007). Henry (2006) also uses Diction 5.0 word frequency counts of optimistic and pessimistic words to determine a net positive/negative tonal measure in order to assess the information content of earnings press releases.

Table 2 contains the descriptive statistics for the variables in the regression model used to analyze Hypotheses 1a and 1b. The OPT mean of .00889 indicates that an average of .89% of the total words of each sample firm MD&A are included in one of the three optimistic Diction dictionaries. The maximum number of positive words for a sample firm was 1.52% of total words while the minimum number for a firm in the sample was .36% of the total words. Likewise Table 2 reflects the mean of the PESS variable to be .0183 indicating that an average of 1.83% of the words in a sample firm MD&A are included in one of the three negative Diction dictionaries. The maximum number of negative words was 3.06% and the minimum was .47% of total MD&A words.

In Davis, Piger, and Sedor (2007), the OPT and PESS variables (computed in the same way as OPT and PESS in this study) had mean values of 1.28% and .46% respectively. The respective maximums for OPT and PESS

were 4.44% and 1.95%, while the minimum for both variables was zero. The variables in the Davis et. al. study were computed using the same Diction dictionaries as have been used in our study. In our study, the mean of PESS is greater than that of OPT. However, in the Davis, et. al. paper, mean OPT is larger as a percentage of total words when compared to the mean PESS variable. Recall that the Davis, et. al. study analyzes the word content of the annual earnings release (a short, unregulated document) and the current study analyzes the MD&A (a much longer, and more highly regulated and scrutinized document). As noted in Section 1.7 (and discussed in greater detail in subsequent sections), our study finds no significant relationship between management use of linguistic tone and either future financial results (Hypothesis H1) or future stock price returns of the sample firms (Hypotheses H2 and H3). Perhaps the fact that the unregulated earnings report contains the greater percentage of positive (OPT) words at the mean, maximum, and minimum levels than does the more highly regulated MD&A should be read as an initial suggestion of the our findings as herein disclosed.

4.3 Tests of Hypotheses 1a and 1b—Predict Future Performance

The first set of hypotheses predicts that managers use optimistic (pessimistic) tone in MD&A to communicate positive (negative) signals to investors about their (the manager's) expectations for future firm operating results. Specifically, Hypothesis H1a suggests that the level of optimistic tone in a firm's MD&A is positively associated with its future financial performance.

Alternatively, Hypothesis H1b suggests that the level of pessimistic tone in a firm's MD&A is negatively associated with its future financial performance. To test these hypotheses, this study examines the levels of optimism and pessimism in the MD&A to determine if they are associated with the firm's future performance. Similar to Core, Holthausen, and Larker (1999) and Bowen, Rajgopal, and Venkatachalam (2007), this study uses a baseline multivariate regression model (Equation 1, page 62) to explain future firm performance based upon the quantitative information provided in the firm's annual report. FUTROA (future firm performance) is the ROA (return on assets) of the firm for the calendar year following the sample year. Table 2 indicates the mean future ROA of a sample firm is 1.91% while the median value of the variable is 6.06%. The minimum and maximum values of FUTROA are a negative 30.25% and a positive 18.96%, respectively.

Table 2 also contains descriptive statistics for the control variables included in the benchmark equation. ROA is the return on assets for sample firms for the sample year of 2002. The mean ROA for sample firms is -.099% while the median value for the variable is .05824 or 5.82%. ROA ranged from a minimum of -34.85% to a maximum of 16.57%.

Control variable PM represents the profit margin achieved by each sample firm during the sample year of 2002. Profit margin in this study is computed using 2002 net operating income divided by total firm assets at December 31, 2002. The mean and median profit margin for sample firms is

negative 15.49% and positive 6.17%, respectively. For ROA and PM the mean and median values suggest that the sample is highly skewed and that a transformation of the data was used in this analysis.

AT is a control variable that represents the number of times sample firm assets turnover during the sample year with respect to firm sales. The variable is computed for this study by dividing total sample firm sales for 2002 by total firm assets at December 31, 2002. Mean and median asset turnover for sample firms is .8795 and .8544, respectively.

Another control variable used in the baseline or benchmark regression model is ΔREV . This variable represents the percentage change in sample firm revenue between the sample year of 2002 and the preceding calendar year. The mean and median value of the variables is 8.02% and 3.9%, respectively.

ROA, PM, AT, and ΔREV are included in the benchmark model in order to capture information concerning future firm financial performance contained in the financial statements and other quantitative financial information included in the sample firm's Form 10-K filing for 2002. As noted in Section 3.5.2, inclusion of these variables in the baseline regression model is consistent with previous research that draws upon fundamental analysis techniques (See also Section 2.1.1.1 for discussion of fundamental analysis).

The two remaining variables in the benchmark model, DA (the ratio of total debt to total assets at the end of the sample year) and BM (the ratio of firm book value to market value), are included as a means of capturing qualitative

information about the sample firm. DA, for example, provides information regarding the level of financial risk employed by the firm. The ratio of book value to market value (BM) is included in order to capture other, non-financial performance measures. BM serves as a proxy for the underlying qualitative subject matter included in the annual report. These two variables are also typical of variables used in prior research that employed fundamental analysis techniques. The mean and median debt to assets ratio of sample firms is 44.23% and 43.5%, respectively. The BM variable has mean and median values of 59.74% and 52.08% of book value to market value, respectively.

The preceding discussion suggests it is important that the sample data compiled for this study be carefully examined to be certain that the information generated for use herein is consistent with the assumptions and requirements implicit in the use of OLS regression. For a complete discussion of the data and regression diagnostics used and their results see Appendix D.

Results of the diagnostic processes discussed in Appendix D suggest the data exhibits a problem with outliers. In order to mitigate the potential influence on the estimated regression coefficients, the data used in this study were Winsorized. Data diagnostics also indicate a problem with heteroskedasticity which has been addressed by the use of robust regression techniques for this study. Further, the residual values generated by the model appear to be non-normal. The non-normality, as measured by skewness and kurtosis, has been reduced (but not eliminated) by the use of Winsorized data

as well as data transformation of certain of the control variables. Some literature suggests that the non-normal errors are potentially associated with the presence of heteroskedasticity. Nothing further was done to sample data with respect to the non-normality issue.

Table 3 presents the correlation matrix for all of the accounting, financial-market, and textual-analysis variables used to analyze Hypotheses 1a and 1b. Several of the independent variables are significantly correlated. Some of the potential problems presented by significant correlation between independent variables have been moderated by the use of the multivariate techniques employed in this study. The diagnostic procedures described in Appendix D also include tests for multicollinearity. The presence of multicollinearity was not found.

4.3.1 Benchmark Model Regression Analysis

Table 4 presents results of the regression analysis of Equation 1, the benchmark or baseline model. As noted previously, the purpose of the baseline equation is to capture information available from accounting and financial-market variables concerning future financial performance of the firm. Through the use of a baseline model, it is possible to determine the amount of incremental information about future firm performance provided by the addition, in Equation 2, of the tonal variables OPT and PESS. The regression analysis of the baseline model reveals a p-value of zero to four decimals for the model F-test. The p-value indicates that the model is useful for our purposes. In other

words, the independent variables of the model reliably predict the dependent variable, FUTROA. The baseline model has an R^2 of .8345 indicating that approximately 83% of the variability of the dependent variable, FUTROA, is accounted for by the variables in the model. In this case the adjusted R^2 also indicates that about 83% (.8321) of the variability of FUTROA is accounted for by the variables in the model, even after taking into account the number of predictor variables included in the model.

The results shown in Table 4 indicate that all of the independent variables in the baseline model provide significant information concerning future firm performance. The parameter coefficients are all significant at the 1% level with the exception of Δ REV which is significant at the 5% level.

Consistent with prior research (Davis, et. al.) and as we expected, the coefficient of ROA is estimated to be positive and less than one. The coefficient (parameter estimate) is .84. For every one percent increase in ROA, a .84 percent increase in FUTROA is predicted. Conversely, for every one percent increase in FUTROA, ROA is predicted to be higher by .84 percent.

Also as expected and consistent with prior research, the regression coefficients of PM and AT are both positive suggesting that each variable has a positive relationship with future firm performance. These facts indicate that positive firm profit margins (PM) and higher levels of asset turnover (AT) suggest positive levels of predicted future firm performance. DA, the model proxy for firm risk is, as expected, negatively related to future performance.

DA's regression coefficient of $-.0385$ suggests that higher levels of debt (and thus firm risk) cause predicted future firm performance to be lower. The negative coefficient on BM, book-to-market ratio, reflects a negative or inverse relation to future firm performance. Higher levels of this ratio suggest that investors hold the belief that the non-financial measurements for which BM is a proxy foretell negative future firm performance for the firm. Finally, ΔREV has a positive regression coefficient suggesting that positive year over year changes in sample firm revenue are positively related to firm performance in the first operating period after the sample year. Recall, that each of the baseline model variable coefficients is significant.

4.3.2 Addition of Tonal Variables to Benchmark Model

The purpose of Hypotheses H1a and H1b is to establish the presence (or lack of presence) of an association between the positive/negative tone of a firm's MD&A and its future financial performance. To make such an assessment two tonal variables, OPT and PESS, were added to the benchmark model just discussed. Regression analysis of Equation 2 that results in significant regression coefficients for the Benchmark model as well as significant coefficient's for the tonal variables will support Hypotheses H1a and H1b.

Table 4 presents the results of the regression analysis of Equation 2. As expected the independent variables included in the Benchmark model all have regression coefficients that are approximately the same as in the analysis of Equation 1 and that are all significant at the 1% level, including ΔREV .

However, the tonal variables OPT and PESS, are not significant. Because of the insignificance of these variables, we are unable to reject the null hypothesis in this case that the coefficients of OPT and PESS are equal to zero. We cannot, therefore, assert that there is an association between manager's language tone and the firm's future performance as we posit in Hypothesis H1a and H1b. Although not statistically significant, the tonal variables have the signs that we expected them to have. The regression coefficient of OPT is positive and that of PESS is negative as we expected.

In Section 4.2 the statistical information relative to OPT and PESS is discussed. As was pointed out there-in, the percent of MD&A words used in this study were found to be the inverse of like statistics used in the prior research of Davis, Piger, & Sedor (2007). In the Davis et al. study, the percentage of total words in earnings press releases that are positive exceeded the percentage of words that are negative. As noted in Section 4.2 (page 74), in the MD&A documents used in this study, the percentage of positive words is less than the percentage of negative words....an inverse result from the Davis et al. study.

In Section 2.2, the reasons for the choice of the Management Discussion & Analysis as the subject of this study were presented and discussed at length. The MD&A was selected for this study primarily because it is arguably the most important source of information available to investors and other users of financial information. In the course of the discussion in Section 2.2, it was also

noted that MD&A is the subject of very rigorous review and oversight procedures by the SEC. Because the SEC subjects the MD&A to such detailed review, the document is subjected, prior to its submission to the agency, to very careful review by the filing firm's public accountants as well as its securities attorneys. By comparison, the quarterly and annual earnings reports used in prior research (Davis et al. (2007), and Henry (2006)) receives no scrutiny by the SEC and very little attention from the firm's public accountants and securities attorneys prior to their release. It seems clear that, given the results of the regression analysis of Equation 2, the stringent review of MD&A prior to its filing with the SEC, tends to eliminate much of the linguistic tone found in earnings reports used in the prior research. This study's finding of no association between the positive and negative linguistic tone of MD&A and future firm performance is, perhaps, not surprising in light of the heavy scrutiny the document receives prior to its filing. An interesting issue for subsequent research will be an analysis of the 2002 (the sample year) President's Letter from the Annual Report to Shareholders for this study's sample firms that investigates the same association as is anticipated in Hypotheses H1a and H1b in this study.

4.4 Tests of Hypotheses 2a and 2b—Short-run Market Reaction

This study's second set of hypotheses predicts that the level of optimistic (pessimistic) tone is positively (negatively) associated with market returns around the MD&A release (Form 10-K filing) date (the short event period). To

test the H2 Hypotheses, the market responses to the levels of optimism and pessimism in the MD&A are examined. Cumulative abnormal return (CAR) is the dependent variable in the regression model developed to test the H2 Hypotheses (see Equation 3, page 65). CAR is the difference between the actual firm return and its expected stock price return over the 20 day window which surrounds the MD&A release date. Table 5 indicates the mean CAR of a sample firm for the short event period is 0.56% while the median value of the variable is 0.31%. The minimum and maximum values of CAR are a negative 14.28% and a positive 17.28%, respectively.

Table 5 also contains descriptive statistics for the control variables included in Equation 3. Control variables ROA, PM, and BM are common to both of the regression models discussed thus far (Equation 1 and Equation 3). Of course OPT and PESS are also common to the two models. The statistical data for these variables was discussed previously in Section 4.3 (page 77 and after).

UE, unexpected earnings, is a control variable that represents the difference between sample firm earnings during the sample year of 2002 and the previous calendar year. The mean and median unexpected earnings for a sample firm are \$.0068 and \$.0054 per share, respectively.

Another control variable used to assess market reaction is the natural log of the market value, $\ln MV$, of sample firms. The size of a sample firm has been shown, in previous research, to have an effect upon market price reactions to

events or information. The mean and median value of the variable is 19.48 and 19.29, respectively. The use of the log transformation was necessary in this case as the untransformed market value data is highly skewed due to the presence of a few very large firms in the sample.

The last of the control variables in Equation 3 is LOSS. LOSS is a dummy variable indicating whether or not the sample firm incurred a loss in the sample period. The variable is one (1) if the firm incurred a loss and zero (0) otherwise.

The six control variables included in the regression model for the second set of hypotheses, ROA, UE, lnMV, LOSS, PM, and BM are included in the model as a means of capturing information contained in the financial statements and other quantitative financial information that is associated with future stock price performance of the firm. As noted in Section 3.5.2, inclusion of these variables in the regression model is consistent with prior research that draws upon fundamental analysis techniques in which the dependent variable is cumulative abnormal return. (See also Section 2.1.1.1 for discussion of fundamental analysis).

As was the case with the regression model used to analyze Hypotheses H1a and H1b, preliminary examination of the data collected for the control variables suggests it is important that the sample data be carefully examined to be certain the information generated using the regression model is consistent with the assumptions and requirements implicit in the use of OLS regression.

Therefore, data and regression diagnostics consistent with those applied to Hypothesis H1 data and discussed in Appendix D were used to analyze the data for Hypothesis H2.

Diagnostic results suggest that the Hypothesis H2 data exhibits a problem with outliers. In order to mitigate the potential influence on the estimated regression coefficients, the data used to test the second set of hypotheses was Winsorized. Diagnostics also indicate a problem with heteroskedasticity which has been addressed by the use of robust regression techniques for this study. Unlike the data discussed in Appendix D (Hypothesis H1 data), the residuals created when the regression was run using the Equation 3 data did not appear to exhibit significant non-normality.

Table 6 presents the correlation matrix for all of the accounting, financial-market, and textual-analysis variables used to analyze Hypotheses 2a and 2b. None of the independent control variables are significantly correlated. However, as a precaution, the diagnostic procedures described in Appendix D as tests for multicollinearity were performed on this data. The presence of multicollinearity was not found.

4.4.1 Equation 3 Regression Analysis

Table 7 presents results of the regression analysis of Equation 3. Although a baseline or benchmark model was not used with respect to Equation 3, it was expected that each of the six control variables in the model would be statistically significant and that the model, overall, would be useful in our

analysis. However, such was not the case. The regression analysis of the Equation 3 model reveals a p-value of .3614 for the model F-test. The p-value indicates that the independent variables of the model do not reliably predict the dependent variable, CAR. The model has an R^2 of .0200 indicating that approximately 2.00% of the variability of the dependent variable is accounted for by the variables in the model. The adjusted R^2 indicates that only about .58% (.0058) of the variability of CAR is accounted for by the variables in the model, after taking into account the number of predictor variables included in the model. The model is not useful for predicting stock price performance of the sample firm during the short event window.

The results shown in Table 7 indicate that none of the control variables in the model, except for UE, provide significant information concerning expected stock price performance during the short event period as none of the variables (excepting UE) is statistically significant. Variable UE is significant at the 5% level. The tonal variables OPT and PESS, like the control variables, are both statistically not significant.

Additionally, the signs of the estimated coefficients of the model variables resulting from the regression analysis are, in several cases, not as expected. LOSS, for example, is expected to have a negative sign indicating an inverse relationship between a firm experiencing a loss in the sample period (or not) and stock price performance during the short event period. Regression analysis of Equation 3 indicates a positive rather than negative sign for LOSS.

For the PM variable a positive association is expected between profit margin and stock price performance. As Table 7 shows, the sign resulting from the regression analysis of Equation 3 for PM is negative rather than positive. The signs for the remaining variables in Equation 3, including the tonal variables OPT and PESS are as expected.

The results of the regression analysis of Equation 3 are surprising and puzzling. The results of the analysis of Equation 3 suggest either a serious error in specifying the model or significant problems with the sample data. In an effort to identify the problem, the studies previously referenced in this research that discussed either fundamental analysis concepts or used fundamental analysis concepts in the context of their studies were reviewed a second time. Based upon the review of fundamental analysis concepts, it was determined that the design and specification of this study's model was appropriate. The variables included in the model have been used in prior research to make associations of the type we are attempting to make in our study. All of the sample data calculations were reviewed and tested for accuracy in their computation. It was determined that the data used in the analysis have been correctly computed. There remains only one reasonable explanation for the complete lack of performance of the Equation 3 model. The problem must reside in the dependent variable CAR. The methodology of the computation of CAR has been thoroughly double checked and the data used to compute CAR found to be correct.

Our work has identified a well specified model as well as accurately collected and computed sample data for both the dependent and independent variables. Could some sort of market disturbance or anomaly have occurred during the short event period that was of sufficient magnitude to cause the Equation 3 model to fail to reliably predict market returns for the sample firms? A search was performed to identify events that occurred before and during the short event window the nature and significance of which could move the capital markets sufficiently to cause such unusual market results for sample firms.

In early October, 2002, the Dow Jones Industrial Average (DJIA) was at 7422.84. By mid January, 2003, after an uninterrupted rise during the fourth calendar quarter of 2002, the DJIA reached 8842.62. However, beginning on January 15, 2003, and for the two months thereafter, the DJIA suffered an erratic decline that lead to a low of 7524.06 on March 11, 2003. Immediately thereafter, the DJIA began a renewed upward move and once again topped 8521 by March 21, 2003. Market volatility during the first quarter of 2003 was significantly greater than it had been in the fourth quarter of 2002. Numerous events that drove the erratic market behavior of the period have been identified. During the first quarter of 2003, the world experienced a torrent of events that lead up to the invasion of Iraq on March 19th. In early February, Secretary of State Colin Powell made an historic presentation to the United Nations Security Council of the United States' case for war against Iraq. Around the world debate raged both for and against war in Iraq leading to worldwide unrest and

uncertainty. In a speech to the American people on March 6th, President Bush again laid out the evidence and case for war. Coalition forces invaded Iraq thirteen days later on March 19.

With the backdrop of the build-up to the Iraq war, during the short event window the Bush Administration announced very large Federal budget deficits (January 15th), and on March 7th the Labor Department announced large U.S. job losses in February amounting to 308,000 jobs. On February 7, Homeland Security announced a move to the highest possible security alert level with respect to terror attacks (only the second time since 9-11 that such a high alert level had been deemed necessary). On February 1st the U.S. space shuttle exploded on reentry over Texas dealing a heavy blow to the U.S. space program.

Internationally, in early March fear of a SARS flu pandemic originating in Asia spread throughout the world. On March 3, North Korean jets forced an unarmed U.S. Air Force plane to land in North Korean creating great concern for peace and stability in the Pacific Rim.

Clearly the domestic and international events of the first 75 days of 2003 were sufficiently serious and destabilizing as to be the confounding events that could cause the capital markets to act in a highly unusual and erratic manner. The events described herein caused the markets to react abnormally and, as a result, rendered this study's Equation 3 model inoperative during the short event window.

There is one further fact supporting the idea that confounding events which occurred during the first quarter of 2003 caused the Equation 3 model to fail. The final step in our study will be an analysis of the third set of hypotheses (see Section 4.5). In analyzing Hypotheses 3a and 3b, we will utilize the same independent variables as were used in Equation 3 in a model that looks at long-run market reaction to linguistic tone. The only difference between the two regression models is dependent variables which cover different periods of time. When the regression analysis for the set of H3 Hypotheses was run (see Section 4.5, page 93 and after), the model proved to be useful in the prediction of long-run CAR. Additionally, the control variables are significant with respect to the prediction of sample firm stock price performance (see Table 8). In short, the same model that failed in the prediction of a short period CAR works in the prediction of long-run CAR. It seems clear that the failure of the Equation 3 model to perform as expected is the result of abnormal market conditions that caused highly unusual and erratic market behavior during the short period window used in our analysis.

4.5 Tests of Hypotheses 3a and 3b—Long-run Market Reaction

The third set of hypotheses in this study predicts that the level of optimistic (pessimistic) tone projected by managers in the preparation of MD&A narrative comments has value in the prediction of future stock price performance of the firm. Specifically the H3 Hypotheses posit that the level of optimistic (pessimistic) linguistic tone in a firm's MD&A is positively (negatively)

associated to market returns for the 12 and 24 month periods subsequent to the MD&A release (filing) date. Cumulative abnormal return (CAR) is the dependent variable in the regression model (see Equation 4, page 67) with the independent variables the same as those developed to test the H2 Hypotheses (see Equation 3, page 65). In the H3 model, CAR is the difference between actual firm stock price return and its expected stock price return over the 12 and 24 month periods subsequent to the filing date of Form 10-K for the sample year.

4.5.1 12 Month Period Regression Analysis

The mean CAR for a sample firm for the 12 month period (April 1, 2003 through March 31, 2004) is 46.44% while the median value of the variable is 18.70%. The minimum and maximum values of CAR for the 12 month period are a negative 33.92% and a positive 215.03%, respectively.

The control variables used in Equation 4 regression analysis are the same as those used in Equation 3 analysis. Table 5 contains descriptive statistics for the control variables included in Equation 4. The statistics and background related to the control variables used in Equation 4 are discussed in Section 4.4 (page 85 and after).

The correlation matrix for the H3 12 month event period model (matrix not presented) includes all of the accounting, financial-market, and textual-analysis variables used to analyze Hypotheses 3a and 3b. None of the independent control variables are significantly correlated. However, as a

precaution, a diagnostic procedure to assess the variance inflation factor (vif) was run on the variables as a test for multicollinearity. The presence of multicollinearity was not found.

Table 8 presents results of the regression analysis of Equation 4 with respect to the 12 month event window. Although a baseline or benchmark model was not used with respect to Equation 4, it was expected that each of the six control variables in the model would be statistically significant and that the model, overall, would be statistically useful in our analysis. The analysis of Hypothesis H3, unlike that of Hypothesis H2, fulfilled our expectations. The regression analysis of the Equation 4 model for the 12 month event period reveals a p-value of zero to four decimal places for the model F-test. At an alpha level of 5% the p-value indicates that the independent variables of the model reliably predict the dependent variable, CAR. The model has an R^2 of .2234 indicating that approximately 22.00% of the variance in CAR can be predicted from the independent variables in the model. The adjusted R^2 indicates that about 21% (.2084) of the variability of CAR is accounted for by the variables in the model, after taking the number of predictor variables included in the model into account. The model is useful in predicting stock price performance of the sample firm during the 12 month event period.

The results shown in Table 8 indicate that each of the control variables in the model provide significant information concerning expected stock price performance during the 12 month event period. The tonal variables OPT and

PESS are both statistically insignificant indicating that they are not statistically associated with sample firm stock price performance during the 12 month event period.

The signs of the estimated coefficients of the Equation 4 model variables which were the result of the regression analysis are about as expected with one or two exceptions. The model in Equation 2 (Table 4) attempted to predict future firm financial performance (future ROA). Regression analysis for Equation 2 revealed an estimated coefficient for ROA that is positive suggesting that greater current period ROA is a useful predictor of the next accounting year's ROA. Regression analysis of Equation 4 for the 12 month event window (and the 24 month period as well) reveals an estimated coefficient for ROA that is negative. This suggests an inverse relationship between sample period ROA and future period stock price returns. In other words, the negative relationship indicates that perhaps investors do not believe that higher current period ROA leads to higher future period ROA and therefore, do not reward the firm with higher future stock prices based on current period ROA. This result is at odds with our findings in the analysis of Equation 2 which finds a statistically significant relationship between current period and future period ROA.

On the other hand, investors apparently do appreciate a firm that can improve its earnings per share from one period to the next as is demonstrated by the regression coefficient for the UE variable. UE is the percentage of increase in earnings from the accounting period just prior to the sample year

and the sample year. Table 8 shows that UE has a positive regression coefficient indicating that greater unexpected earnings in the sample year are viewed positively by investors regarding the firm's future earnings potential. Accordingly investors reward the firm with greater CAR at the end of 12 month event period.

The regression coefficient for $\ln MV$, the log of the market value of the sample firm at the end of the sample year, is negative. This result suggests that firms with larger market caps are not rewarded by investors with the same level of increases in stock price as are smaller firms. Recent market history suggests that most significant moves are lead by small and mid-cap firms rather than larger cap firms. In mid 2003 the market began to recover, in earnest, from the dot com bubble explosion of early 2000. This market rally was led by mid-cap firms confirming the historical observation. Thus the negative sign related to the coefficient for the $\ln MV$ variable that is a proxy for firm size is reasonable.

The dummy variable LOSS indicates that the sample firm did (variable = 1) or did not (variable = 0) incur a loss in the sample year. This variable has a positive sign indicating that investors are optimistic about the relation between a current operating loss and the firm's ability to recover and generate future profits. This investor attitude is consistent with research suggesting that operating losses by firms are not permanent and that the loss firm soon returns to profitability.

The variable PM, firm profit margin, has a positive regression coefficient.

The firm profit margin indicates the quality of firm earnings and is also a proxy for the quality of firm management. Investors view higher profit margins positively with respect to the prospect of future earnings performance and, as a result, reward the firm with better stock price returns.

BM, the book to market value ratio of the sample firm, has a positive regression coefficient. The variable is a proxy for other non-financial, non-quantitative information that is included in the Form 10-K. The positive coefficient of variable BM indicates that greater amounts of information about the firm create an investor attitude about the firm's future that is positive. This positive attitude appears to continue into future periods in terms of the investor's willingness to pay prices for firm stock that yield positive cumulative abnormal returns.

As noted earlier, regression analysis for Equation 3 for the 12 month event period yielded variables OPT and PESS that are not statistically significant. This result indicates that we must again fail to reject our null hypothesis that the coefficients of OPT and PESS are zero. Therefore, there does not appear to be a statistically significant association between the level of positive or pessimistic tone in manager's qualitative comments and future cumulative abnormal returns on a firm's stock price during the 12 month event period following the filing of the Form 10-K. It is noteworthy that, although the coefficients of these two variables are not statistically significant, the signs of

both OPT and PESS are respectively positive and negative...as we expected them to be.

4.5.2 24 Month Period Regression Analysis

The H3 Hypotheses included both a 12 month and a 24 month event period event study. The purpose of the second, longer, event window is to determine if the effect of language tone, if any, is long lived. Therefore, the final analysis of this study uses a model identical to that used for the H2 and H3 12 month regression analysis. The difference obviously rests in the computation of CAR which uses the cumulative abnormal return for the period the beginning April 1, 2003 and ends March 31 2005.

The mean CAR for a sample firm for the 24 month period (April 1, 2003 through March 31, 2005) is 25.7% while the median value of the variable is 3.94%. The minimum and maximum values of CAR for the 24 month period are a negative 65.56% and a positive 190.37%, respectively.

The control variables used in the Equation 4 24 month event period regression analysis are the same as those used in the Equation 3 12 month event window analysis. Table 5 contains descriptive statistics for the control variables included in Equation 4. The statistics and background related to the control variables used in Equation 4 are discussed in Section 4.4 (page 85 and after).

The correlation matrix for the H3 24 month event period model (matrix not presented) includes all of the accounting, financial-market, and textual-

analysis variables used to analyze Hypotheses 3a and 3b. None of the independent control variables are significantly correlated. However, as a precaution, a diagnostic procedure to assess the variance inflation factor (vif) was run on the variables as a test for multicollinearity. The presence of multicollinearity was not found.

Table 8 presents results of the regression analysis of Equation 4 with respect to the 24 month event window. With respect to Equation 4, it was expected that each of the six control variables in the model would be statistically significant and that the model, overall, would be statistically useful in our analysis. The regression analysis of the Equation 4 model for the 24 month event period reveals a p-value of zero to four decimal places for the model F-test. The very small p-value indicates that the independent variables of the model reliably predict the dependent variable, CAR. The model has an R^2 of .1289 indicating that approximately 13% of the variance in CAR can be predicted from the independent variables in the model. The adjusted R^2 indicates that about 11% (.1120) of the variability of CAR is accounted for by the variables in the model, after taking into account the number of predictor variables included in the model. The model continues to be useful in the prediction of stock price performance of the sample firm for the 24 month event period. However, the R^2 of the 24 month event period is approximately half of the R^2 of the 12 month event period. This result is not unexpected due to the greater amount of time between the end of the 12 month event window and the

end of the 24 month window. As time elapses between the end of the sample year and the close of the event window, more events can take place or additional information can become known that has an impact upon firm performance results and thus stock price performance.

The results shown in Table 8 indicate that not all of the control variables remain statistically significant at the end of the 24 month event period. The firm size variable, $\ln MV$, as well as the book to market ratio variable, BM , remain negative and positive, respectively, in relation to CAR and are significant at the 1% level. Firm profit margin, PM , continues to be positive and is statistically significant at the 5% level of significance. The dummy variable $LOSS$ also remains positive in relation to CAR but is significant only at the 10% level. The ROA and UE , unexpected earnings, variables retain the same signs as with the 12 month event period analysis. However, both of the variables are no longer statistically significant. As occurred with the R^2 factors between the 12 and 24 month event windows, the diminishing levels of statistical significance noted for the control variables in the 24 month model is the result of the greater amount of elapsed time between the calculation of the control variables and the dependent variable for the 24 month event window. Like the 12 month event period analysis, the tonal variables OPT and $PESH$ are not significant statistically indicating that they are not statistically associated with sample firm stock price performance during the 24 month event period.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Chapter 5 is organized in the following manner. Section 5.1 presents a summary of the study including justification for the study, hypotheses, methodology, and results. Section 5.2 presents the implications and conclusions that can be drawn from the results of the study. Section 5.3 presents the limitations of the study, and Section 5.4 will present suggestions for future research.

5.1 Summary Findings

In Regulation S-K, the SEC states that the purpose of MD&A is to provide investors and other financial statement users with information necessary for the assessment of the financial condition and results of operation of the registered firm. The information content of the quantitative aspects of financial reports has been a focus of a great deal of research beginning with Ball and Brown (1968) and Beaver (1968). Because of the importance of narrative or qualitative disclosures, during the 1980's researchers began to examine management's narrative communications by attempting to assess the information content of the president's letter as well as quarterly earnings announcements. The purpose of our study was to determine if the linguistic tone (optimistic/pessimistic) used by managers in the preparation of MD&A is

useful in the prediction of both future financial performance and future stock price return of a firm.

Similar previous research found positive results when the same questions were asked about the president's letter (contained in the annual report to shareholders) as well as quarterly and annual earnings announcements. Management Discussion and Analysis (MD&A) which is a required part of Form 10-K, the annual filing to the SEC required of all domestic, publically registered and traded companies has not previously been the subject of the type of research undertaken herein. To assess the optimistic and pessimistic language contained in the MD&A narrative comments, a computer program, Diction 5.0, was used to count positive and pessimistic words used by managers in the MD&A. From the word counts, a tonal index of positive and pessimistic language used in the commentary was compiled. With the tonal index terms as a part of a regression model, our research attempted to identify an association between future financial results of the firm and the linguistic tone managers used in their narrative comments (Hypothesis H1). Further, the same tonal index terms were used to determine if there is an association between future stock price returns and the tone managers use in their narrative comments (Hypotheses H2 and H3).

The regression model used to analyze the H1 hypothesis used future return on assets for the firm as the dependent variable. The analysis of the H2 and H3 hypotheses used cumulative abnormal return on the firm stock price as

the dependent variable. Careful sample selection and the use of variables (sample period ROA, unexpected earnings, firm profit margin, market value of the firm, book to market ratio, and others) that have been shown to have information content in prior fundamental analysis based research controlled for possible compounding effects of information other than that contained in the tonal index terms.

The results presented in Chapter 4 provide evidence that the MD&A tonal index terms used in the analysis of all three sets of hypotheses (H1, H2, and H3) are not useful in the prediction of future firm financial performance or future stock price performance. No association is indicated between linguistic tone and future firm financial performance (hypothesis H1) or between linguistic tone and future stock price returns for the firm (hypotheses H2 & H3). It should be noted that the results of the analysis of H2 appear to be problematic as there are confounding economic and world events that occurred immediately before or during the short event period that make the regression results impossible to accurately assess.

5.2 Implications

The results of this study provide evidence about the usefulness of MD&A to financial information users. Although managers do not appear to use linguistic tone as a means of revealing information to users, our research suggests that the SEC has achieved its goal of making the MD&A a reliable, unbiased information source upon which users may depend. Manager's use of

linguistic tone as a means of signaling information to users could certainly give users greater insight into manager beliefs about the future of the firm. However, the manager's use of linguistic tone can also lead to manipulation investors with misleading information that can result in erroneous investment decisions. Although we have not proven our original hypotheses, we have succeeded in validating SEC efforts to make the MD&A one of the premier sources of reliable information about a firm. Based upon our research, investors do not have to be concerned about being misled either by a manager's misplaced enthusiasm about their firm's future or by a manager's sinister attempts to manipulate investor actions.

5.3 Limitations of the Study

The results of this study may have been affected by several limitations. The sample for the study was drawn from the NYSE, the ASE, and the NASDAQ. No limitations were placed upon firm size which resulted in a sample that includes a very wide range of firms with respect to size. Further, the sample was drawn from firms in the SIC codes of 20xx and 30xx. Although the firms in these two SIC codes are industrial companies, there is a range of different industries included in the sample. The firm size and industry differentials found in the sample may be problematic with respect to the results of this study. For example, larger firms (with greater resources) may have access to legal counsel more experienced in the practice of preparing and reviewing Form 10-K documents for filing. Further, larger firms often use the

larger accounting firms that also have more experience dealing with SEC matters. These two facts may result in larger firms filing Form 10-K documents that have been “scrubbed” more completely of the words that give rise to the positive or negative tone upon which our research has focused. Smaller firms may not be able to secure the more experienced, more costly counsel that would help rid their submissions of tonal influence. Our research may have yielded different results had sample firms been more comparative as to size.

The limitation of our study with respect to industry differentials is similar to that of the size limitation. Reporting styles and techniques vary among industries. Certain types of information that are important in one industry may not be so important in another requiring different language and styles of presentation. For this reason, the use of a sample that includes a variety of firms from different industries may be problematic for our results. Research that includes a homogenous sample population could lead to a different research result.

5.4 Future Research

Based upon the results of this study, further research may be indicated. First, the limitations described in Section 5.3 suggest additional ways to expand the current research into meaningful and productive areas. Limiting samples so that the sample populations are homogenous as to industry may eliminate differences between sample firms that distort analytical results. Such additional research may eliminate differences between industries that tend to offset each

other in our current research. The differential result could be a finding that, in some industries, managers do tend to provide information by way of the language they use in MD&A.

With respect to firm size, segregating sample firms by market value or some other size marker may eliminate the problems of distortion caused by the effect of firm size differences. A firm with greater resources to use to secure outside consulting services from attorneys and accountants may very well end up filing significantly different documents with the SEC than a smaller firm. Sample populations made up of firms of approximately the same size may yield a different result from that of this current research.

Finally, our research has focused upon MD&A and found that managers do not use language to communicate additional information to investors. Prior research has clearly demonstrated contrary results with respect to the president's letter as well as quarterly and annual earnings announcements. A logical extension of our research would be to perform the same analysis as performed herein on tonal index terms drawn from the president's letter from the annual report to shareholders for the sample year 2002 for the same sample population used herein. It is my belief that the results from such additional research would confirm our original hypotheses.

APPENDIX A

DESCRIPTION OF DICTION 5.0 TEXTUAL ANALYSIS SOFTWARE

Diction 5.0 is a Windows-based software program that uses multiple dictionaries to search textual passages for a total of thirty-five semantic and linguistic features and sub-features. Diction performs its searches using a 10,000 word list that is divided into dictionaries based upon the features and sub-features that each word connotes. Users can create custom dictionaries for use in specific research projects. Upon scanning a document, Diction's output includes raw word count totals, percentages, and standardized statistical scores relative to the linguistic features for which searches.

Diction begins its analysis with pre-established dictionaries from 35 theoretically-based linguistic categories. The word lists included in Diction 5.0 have been used to study narrative text in numerous social science arenas including politics and communication (Hart and Jarvis, 1997) as well as business reports (Henry, 2006; Davis, Piger, and Sedor, 2007; and Yuthas, Rogers, and Dillard, 2002). Diction performs its analysis of narrative text using pre-existing search rules and algorithms. It is systematic and essentially free of subjectivity and potential bias which is common when semantic analysis is performed judgmentally by researchers. Though designed originally to analyze political rhetoric, Diction 5.0 is well suited for the analysis of business reports as the subject matter is similar to that of political discourse (discussing goals and plans as well as discussing the past, the present, and the future).

APPENDIX B

DICTION 5.0 TONAL MEASURE WORD LISTS

Panel A: Diction 5.0 Word Lists Used to Construct Positive Tone Measure (POS)

Praise Word List

Description: ¹	Affirmations of some person, group or abstract entity. Included are terms isolating important social qualities, physical qualities, intellectual qualities, entrepreneurial qualities, and moral qualities. All terms in this list are adjectives.
Number of Words:	195
Sample Words:	best, better, capable, favorable, good, great, important, positive, profitable, strong, successful

Satisfaction Word List

Description: ¹	Terms associated with positive affective states, with moments of undiminished joy and pleasurable diversion, or with moments of triumph. Also included are words of nurturance.
Number of Words:	315
Sample Words:	applaud, attracts, celebrate, comfortable, confident, delighted, enjoy enthusiasm, excited, pleased, satisfied

Inspiration Word List

Description: ¹	Abstract virtues deserving of universal respect. Most of the terms are nouns isolating desirable moral qualities as well as attractive personal qualities. Social and political ideals are also included.
Number of Words:	122
Sample Words:	commitment, dedication, enrichment, improvement, loyalty, productivity, progress, promise, quality

¹ Descriptions of each word list obtained from Diction 5.0 documentation (Hart, 2000).

Panel B: Diction 5.0 Word Lists Used to Construct Negative Tone Measure (NEG)

Blame Word List

Description: ¹	Terms designating social inappropriateness and evil. In addition, adjectives describing unfortunate circumstances or unplanned vicissitudes are included. Also contains outright denigrations.
Number of Words:	346
Sample Words:	adverse, bad, bleak, careless, costly, grim, hard, mediocre, struggling, troubled, unstable, upsetting

Hardship Word List

Description: ¹	Contains natural disasters, hostile actions and censurable human behavior. Also includes unsavory political outcomes as well as normal human fears and incapacities.
Number of Words:	470
Sample Words:	abuse, alarmed, battle, burden, conflict, depressed, disappointing, discouraged, fail, fear, hardship, problem, regret, setback, threaten, unfortunately, weakness

Denial Word List

Description: ¹	Consists of standard negative contractions, negative function words, and terms designating null sets.
Number of Words:	39
Sample Words:	aren't, cannot, didn't, shouldn't, don't, nor, not, nothing

¹ Descriptions of each word list obtained from Diction 5.0 documentation (Hart, 2000).

APPENDIX C

CUSTOM LISTS OF POSITIVE AND NEGATIVE WORDS

The following are lists of positive and negative words used by Elaine Henry (2005) to establish the positive or negative orientation of annual press releases using DICTION 5.0:

POSITIVE word list: positive positives success successes successful succeed succeeds succeeding succeeded accomplish accomplishes accomplishing accomplished accomplishment accomplishments strong strength strengths certain certainty definite solid excellent good leading achieve achieves achieved achieving achievement achievements progress progressing deliver delivers delivered delivering leader leading pleased reward rewards rewarding rewarded opportunity opportunities enjoy enjoys enjoying enjoyed encouraged encouraging up increase increases increasing increased rise rises rising rose risen improve improves improving improved improvement improvements strengthen strengthens strengthening strengthened stronger strongest better best more most above record high higher highest greater greatest larger largest grow grows growing grew grown growth expand expands expanding expanded expansion exceed exceeds exceeded exceeding beat beats beating

NEGATIVE word list: negative negatives fail fails failing failure weak weakness weaknesses difficult difficulty hurdle hurdles obstacle obstacles slump slumps slumping slumped uncertain uncertainty unsettled unfavorable downturn depressed disappoint disappoints disappointing disappointed disappointment risk risks risky threat threats penalty penalties down decrease decreases decreasing decreased decline declines declining declined fall falls falling fell fallen drop drops dropping dropped deteriorate deteriorates deteriorating deteriorated worsen worsens worsening weaken weakens weakening weakened worse worst low lower lowest less least smaller smallest shrink shrinks shrinking shrunk below under challenge challenges challenging challenged

APPENDIX D

ANALYSIS OF OLS DATA GENERATION ASSUMPTIONS

An Ordinary Least Squares regression model is used for this study. The Ordinary Least Squares (OLS) model consists of several basic assumptions about the way in which data observations are generated. This appendix contains a discussion of the OLS assumptions and of the tests performed on the data used in this research study in order to ensure that all of the assumptions are essentially satisfied. The statistical analysis for this study was performed using Stata Statistics/Data Analysis rel. 9.2 software which is manufactured by Stata Corp. All of the nonparametric data analysis discussed herein as well as the regression analysis discussed in the main body of this research used test routines included in Stata rel. 9.2.

In Section 4.1, while discussing sample firm statistics, it was suggested that, due to the significant diversity in size of the sample firms, certain of the control variables could have problems with unusual or influential data observations in the form of outliers. Though not thought of as an OLS assumption, outliers can unduly influence the coefficient estimates of OLS regression models. To ascertain the magnitude of any outlier problems, data scatter plots and histograms were prepared for the dependent and each of the independent variables used in the regression model for Hypothesis 1 (Equations 1 and 2). Additionally, a scatter plot matrix was prepared containing plots of each independent variable against the dependent variable as well as against the other independent variables. The scatter plots and histograms all

indicate the presence of outliers that appeared capable of significantly affecting the coefficient estimates for all of the variables. Other Stata supporting tests provide the same indications. As a result of the above analysis, the data observations used in this research will be Winsorized.

One of the OLS assumptions is that the dependent variable of the regression model be calculable as a linear function of the set of independent variables, plus an error term. Review and analysis of the scatter plot matrix, described in the preceding paragraph, as well as review of related Stata analytical routines, indicates that the relation between the dependent variable and each independent variable is linear in nature. The linearity issue is not of concern with the sample data used in this study.

Two other OLS assumptions require that the mean of the errors around the line of the regression be normally distributed and that they be equal to zero for all values of the independent variables. The Equation 1 regression model applied to the sample data in this study generates residual values with a mean of zero. After examining numeric data descriptions as well as histograms and normal probability plots for each of the model variables, there appeared to be problems with the certain of the variables with respect to normality of the distributions. Significant levels of skewness and kurtosis were present in the data. After transforming several of the variables, the skewness of those variables was significantly reduced. Subsequent histograms of the data suggest that the symmetry of the data is approximately normal. However,

kurtosis, though significantly reduced, is still present. The transformed data was regressed a second time using Equation 1 and residual values were recomputed. The newly computed error terms have a mean value of approximately zero and symmetry approximating a normal distribution curve, indicating that skewness is not significantly present in the residuals. However, kurtosis is still present and as a result, the distribution of the residual values continues to reflect some non-normality. This observation is based upon a review of the error term histogram, a normal probability plot, a probability density plot, and a Shapiro-Wilk test for normality.

A fourth OLS assumption is that the variance of the residuals is the same for each value of independent variable. The assumption here is that the variance (σ_e^2) of the residual population does not change as the value of the independent variables change. This is the assumption of homoscedasticity. By applying both the Breusch-Pagan test for heteroskedasticity and the White's test for heteroskedasticity as well as an inspection of the data plot of residual values against the dependent variable, FUTROA, it was determined that heteroskedasticity is present in the sample data. It is likely that the heteroskedasticity problem also has a causal role with respect to the problem of non-normality noted in the preceding paragraph. In order to mitigate the issues caused by heteroskedasticity, a robust form of regression analysis must be used in this study.

Another OLS assumption is that the errors associated with one observation are not correlated with the errors of any other observation. Stated differently, the residual values must be independent of each other by virtue of there being no linear relationships between the independent variables. A lack of independent residuals results in multicollinearity. Using variable inflation factors as analytical tools, it was determined that multicollinearity is not a factor with the sample data in this study.

The pilot study upon which this research has been built included a small sample of 15 predominately large industrial firms. Equation 1, as presented in the original proposal for this research, included three variables that are not a part of the model in its final form. One additional variable has been added to the model since its original proposal. The change in the model is the result of analysis performed, after the complete data sample was selected, in order to determine if the model, as originally constituted, was the optimum association of variables, given the completed sample. Stata includes several model specification routines for use in assessing specification errors and in identifying optimum variable groupings. Applying two of the Stata routines (ovtest and linktest) to the original Equation 1, it was determined that three of the variables originally included did not add value to the model. Further, through the process of analyzing a number of variables that were not included in the original model, a previously omitted variable that does add value to the results was identified and added to the model. The regression coefficients and the R^2 of the final

model were significantly improved over the results obtained in the pilot study as a result of the omission and addition of variables to the model.

The preceding evaluation and diagnostic analysis of regression data has been done three times through the course of this research, once for each set of Hypotheses (H1, H2, and H3). The diagnostic routines and data analysis processes used for each of the three hypotheses were the same. Rather than include a complete description and discussion of the analysis for each of the three data set variations, this Appendix has been provided to demonstrate the specific analytical approaches used. Since the approach has been the same for each hypothesis, hereafter the diagnostic results and their effects upon the regression analysis will be discussed in the body of Chapter IV. Detailed discussion of the various procedures as described in this Appendix will not be presented.

APPENDIX E

DATA TABLES

Table 1

Number of Sample Firms By Industry Group

97	Chemicals, Pharmaceuticals & Allied Products
62	Electronic Equipment, Generators, Appliances, Communication Equip.
61	Laboratory & Medical Equip., Instrumentation, Photographic Equip., Watches
56	Farm & Construction Machinery, Industrial Equipment, Computer Equipment
18	Motor Vehicles, Aircraft, Ship Building, Railroad Equipment, Motorcycles
15	Food & Allied Products
13	Primary Metal Products, Foundries, Smelting
13	Metal Cans, Cutlery, Doors, Sheet Metal, Screws, & Bolts
10	Papers & Allied Products
10	Rubber, Plastics & Allied Products
9	Publishing or Publishing & Printing
9	Jewelry, Musical Instruments, Toys, Sporting Goods, Writing Instruments
8	Household Furniture
8	Leather & Leather Products
8	Glass, Cement, Clay, & Stone Products
5	Lumber & Wood Products
5	Petroleum Refining & Related Products
4	Textile Mill Products
3	Apparel & Other Finished Products of Fabrics
9	Miscellaneous
423	Total Sample Firms

Table 2**Descriptive Statistics: Hypothesis 1a and 1b**

	Mean	Median	Min.	Max.	Std. Dev.
FUTROA	0.01912	0.06057	-0.30254	0.18955	0.14660
ROA	-0.00099	0.05824	-0.34847	0.16575	0.16155
PM	-0.15489	0.06174	-1.47281	0.17328	0.50382
AT	0.87953	0.85440	0.19750	1.61890	0.45041
DA	0.44229	0.43500	0.12800	0.79260	0.22214
BM	0.59742	0.52080	0.16820	1.18470	0.33796
Δ REV	0.08021	0.03891	-0.21116	0.52401	0.21391
OPT	0.00889	0.00844	0.00408	0.01520	0.00359
PESS	0.01825	0.01746	0.00800	0.03062	0.00474

This table presents the descriptive statistics for all accounting, financial-market, and textual-analysis variables. FUTROA is the sample firm return on assets for the calendar year following the sample year of 2002. ROA is the sample firm return on assets for the sample year of 2002. ROA is computed by dividing firm operating income by firm total assets at December 31, 2002. PM is sample firm profit margin for the sample year. PM is computed by dividing operating income by total firm revenue for the sample year. AT, asset turnover, is a measure of the efficiency with which firm assets are utilized. It is computed by dividing total assets at December 31, 2002, by total revenue for the sample year. DA, total sample firm liabilities divided by total firm assets, is a measure of firm risk. BM is the ratio of sample firm book value to market value at December 31, 2002. This is a measure of non-financial variables that can impact future firm earnings performance. Δ REV is computed as the difference between sample year total revenue and that of the prior year scaled by prior year total revenue. OPT and PESS are, respectively, the ratios of optimistic and pessimistic words to total words in the sample firm MD&A for 2002.

Table 3

Correlation Matrix: Hypothesis 1a and 1b Variables

	FUTROA	ROA	PM	AT	DA	BM	ΔREV	OPT	PESS
FUTROA	1.0000								
ROA	0.9003	1.0000							
PM	0.8406	0.8904	1.0000						
AT	0.5671	0.5660	0.5723	1.0000					
DA	0.1817	0.1978	0.2254	0.2191	1.0000				
BM	-0.0831	0.0067	0.0866	0.0667	-0.1522	1.0000			
ΔREV	-0.0217	-0.0209	-0.0490	-0.0196	-0.0408	-0.2516	1.0000		
OPT	0.0827	0.0925	0.0799	0.0522	0.0797	-0.0062	0.0301	1.0000	
PESS	-0.0566	-0.0612	-0.0313	0.0098	-0.1007	0.0839	-0.0159	-0.0289	1.0000

This table reports correlation coefficients for all accounting, financial, and textual-analysis variables for the regression model used to analyze Hypotheses 1a and 1b. Variable definitions are presented in Table 2.

Table 4**Tests of Association Between Tone and Future Firm Performance
Equation 1a and 1b**

$$\text{FUTROA}_i = \beta_0 + \beta_1\text{ROA}_i + \beta_2\text{PM}_i + \beta_3\text{AT}_i + \beta_4\text{DA}_i + \beta_5\text{BM}_i + \beta_6\Delta\text{REV}_i + \beta_7\text{OPT}_i + \beta_8\text{PESS}_i + \varepsilon_i$$

Variable	Equation 1	Equation 2
Intercept	-0.0424*** (6.58)	0.0480*** (6.36)
ROA	0.8359*** (38.27)	0.8123*** (35.87)
PM	0.0248*** (3.50)	0.0307*** (4.19)
AT	0.0102*** (2.37)	0.0117*** (2.61)
DA	-0.0385*** (-5.18)	-0.0399*** (-5.19)
BM	-0.0247*** (-4.99)	-0.0258*** (-5.02)
ΔREV	0.0126* (1.65)	0.0134*** (1.71)
OPT		0.1098 (0.45)
PESS		-0.1729 (-1.12)
Adjusted R ²	.8321	0.8313

This table presents hypothesis test results regarding the association between measures of future firm performance and levels of optimistic and pessimistic tone in MD&A (i.e. Equations 1 & 2). FUTROA is the Return on Assets of the sample firm for the calendar year following the sample year of 2002. All other variable definitions are discussed in Section 4.1. *T*-statistics computed using White (1980) heteroskedasticity robust standard errors are presented in parenthesis.

*/**/*** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed *t*-test.

Table 5**Descriptive Statistics: Hypotheses 2a and 2b**

	Mean	Median	Min.	Max.	Std. Dev.
CAR	0.00569	0.00312	-0.14288	0.17288	0.09462
ROA	-0.00099	0.05824	-0.34847	0.16575	0.16155
UE	0.00676	0.00540	-0.11410	0.14140	0.07179
lnMV	19.47690	19.29729	15.20804	25.35189	2.04942
LOSS	0.42316	0.43500	0.00000	1.00000	0.49464
PM	-0.15489	0.61739	-1.47281	0.17328	0.50381
BM	0.59742	0.05208	0.16820	1.18470	0.33796
OPT	0.00938	0.00844	0.00094	0.10744	0.00662
PESS	0.01892	0.01746	0.00000	0.12434	0.01062

This table presents the descriptive statistics for all accounting, financial-market, and textual-analysis variables. CAR is the difference between the sample firm actual stock price return and the value weighted NYSE Index return for the 20 day period around the MD&A filing date. ROA is the sample firm return on assets computed for the sample year 2002. ROA is computed by dividing firm operating income by total net assets at December 31, 2002. UE represents unexpected earnings calculated as the difference between sample year earnings and prior year earnings. The variable lnMV is the natural log of the market value of the sample firm and is a proxy for firm size. LOSS is a dummy variable indicating whether or not the sample firm incurred a loss for the sample year. PM is sample firm profit margin for the sample year. PM is computed by dividing operating income by total revenue for the year. BM is the ratio of sample firm book value to firm market value at December 31, 2002. BM is a measure of non-financial variables that can have an impact upon future firm earnings performance. OPT and PESS are, respectively, the ratios of optimistic and pessimistic words to total words in the sample firm MD&A for 2002.

Table 6

Correlation Matrix: Hypothesis 2a and 2b Variables

	CAR	ROA	UE	lnMV	LOSS	PM	BM	OPT	PESS
CAR	1.0000								
ROA	-0.0515	1.0000							
UE	0.1033	0.0972	1.0000						
lnMV	0.0105	0.3084	-0.0672	1.0000					
LOSS	0.0355	-0.6921	-0.2512	-0.1856	1.0000				
PM	-0.0585	0.8904	-0.1038	0.2572	-0.5822	1.0000			
BM	-0.0689	0.0067	-0.0795	-0.4022	0.0543	0.0866	1.0000		
OPT	0.0000	0.0925	0.0082	0.0645	-0.1089	0.0799	-0.0062	1.0000	
PESS	-0.0493	-0.0612	0.0188	-0.0525	0.0973	-0.0313	0.0839	-0.0289	1.0000

This table reports correlation coefficients for all accounting, financial, and textual-analysis variables for the regression model used to analyze Hypotheses 2a and 2b. Variable definitions are presented in Table 5.

Table 7**Test of Short-run Market Response to Linguistic Tone in MD&A Comments
Hypothesis 2a and 2b**

$$CAR_i = \beta_0 + \beta_1 ROA_i + \beta_2 UE_i + \beta_3 \ln MV_i + \beta_4 LOSS_i + \beta_5 PM_i + \beta_6 BM_i + \beta_7 OPT_i + \beta_8 PESS_i$$

Variable	Equation 3
Intercept	-0.0038 (-0.06)
ROA	0.0094 (0.12)
UE	0.1679** (2.28)
lnMV	0.0008 (0.28)
LOSS	0.0088 (0.60)
PM	-0.0116 (-0.52)
BM	-0.0143 (-0.85)
OPT	0.2228 (0.29)
PESS	-0.4057 (-0.85)
Adjusted R ²	0.0058

This table presents hypothesis test results for whether or not the market responds to optimistic and pessimistic tone in MD&A around the time of the filing of Form 10-K. CAR is the cumulative abnormal return for the period of time beginning nine (9) days prior to the filing of Form 10-K and ending ten (10) days following the filing date. All other variable definitions are detailed in Table 5. *T*-statistics computed using White (1980) heteroskedasticity robust standard errors are presented in parenthesis. */**/**** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed *t*-test.

Table 8**Test of Long-run Market Response to Linguistic Tone in MD&A Comments
Hypothesis 3a and 3b**

$$CAR_i = \beta_0 + \beta_1 ROA_i + \beta_2 UE_i + \beta_3 \ln MV_i + \beta_4 LOSS_i + \beta_5 PM_i + \beta_6 BM_i + \beta_7 OPT_i + \beta_8 PESS_i$$

Variable	Benchmark	12 Months	Benchmark	24 Months
Intercept	.8775** (2.18)	.9173** (2.20)	1.3206*** (2.80)	1.3821*** (2.90)
ROA	-1.6994*** (-3.30)	-1.6860*** (-3.26)	-.6205 (-1.04)	-.6332 (-1.06)
UE	.9698** (2.02)	.9740** (2.02)	.3092 (.55)	.3886 (0.69)
lnMV	-.0412** (-2.20)	-.0414** (-2.19)	-.0704*** (-3.21)	-0.0669*** (-3.05)
LOSS	.2759*** (2.89)	.2740*** (2.83)	.1723* (1.55)	.1796* (1.60)
PM	.3209** (2.20)	.3160** (2.15)	.3757** (2.23)	.3884** (2.30)
BM	.3629*** (3.31)	.3694*** (3.34)	.3999*** (3.12)	.4247*** (3.30)
OPT		4.9404 (0.54)		3.4130 (0.59)
PESS		-.4071 (-0.09)		-6.4690 (-1.78)
Adjusted R ²	0.2121	0.2084	.1103	0.1120

This table presents the results of hypothesis tests to determine whether the market responds to optimistic and pessimistic tone in MD&A during the 12 and 24 month periods following the filing of Form 10-K. CAR for the 12 month period begins on the first day of the 2nd quarter of calendar 2003 and ends on March 31st of 2004. The 24 month period begins on the first day of the 2nd quarter of 2003 and ends on March 31st of 2005. All other variable definitions re discussed in Section 4.1. *T*-statistics computed using White (1980) heteroskedasticity robust standard errors are presented in parenthesis. */**/*** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based upon a two tailed *t*-test.

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After more than thirty years in industry in Controllershship and CFO positions, Mr. Elrod desired to cap his successful professional career by teaching and doing research. During his doctoral program his teaching work validated his interest in teaching. Mr. Elrod plans to continue his research in the area of financial reporting as well as developing skills and techniques that will continue to improve his effectiveness in the classroom.