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To the Graduate Council:

I am submitting herewith a dissertation written by Charles Wayne Alderman entitled "An Empirical Analysis of the Impact of Selected Audit Opinion Qualifications on the Market Risk Components." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Business Administration.

Norman E. Dittrich, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

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Graduate Studies and Research

Thesis
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AN EMPIRICAL ANALYSIS OF THE IMPACT OF SELECTED AUDIT OPINION QUALIFICATIONS ON THE MARKET RISK COMPONENTS

A Dissertation

Presented for the

Doctor of Business Administration

Degree

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Charles Wayne Alderman

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Any attempt to assign the origin of this idea to any particular person, seminar, or discussion would be fruitless. There are, however, particular individuals who should be recognized. Among these are the persons whose names are affixed to this document as representatives of my dissertation committee.

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ABSTRACT

Attestation regarding the degree to which a firm's financial statements are fairly presented is among the most basic services provided by the public accounting profession. The profession recognizes that a significant aspect of the attest function is its contribution to the communicative effectiveness of financial reporting.

Financial literature widely recognizes that the valuation of any asset is determined by its risk and return characteristics. The Financial Accounting Standards Board formally recognizes that only those disclosures apprising investors about risk and return constitute relevant information. Thus, attestation, as an independent assessment of the quality of financial information, can be viewed as conveying information regarding relative risk and returns.

The objective of this study is to determine the apparent informational impact of audit opinions containing either consistency or uncertainty qualifications. Their impact is measured by their apparent effect on the capital market risk components, elements of the widely recognized financial market model.

Based on certain general and opinion pattern criteria, samples of firms receiving qualified opinions and related control samples of firms receiving only unqualified opinions were selected from Accounting Trends and Techniques. Changes in risk components were measured for each sample company for two 36-month time spans prior and subsequent to each tested audit report. Chi-square tests were applied to the data

measuring the time-series changes in systematic and unsystematic risk. Analyses supported the expectation that no significant differences in changes of the risk components existed between the samples.

This study indicates that audit opinions containing either consistency or uncertainty qualifications apparently have little impact on the risk components and thus, are only of marginal informational value to aggregate investor groups. Also, results of this study analyzing risk measures support conclusions of market efficiency found in earlier studies analyzing security returns.

An ancillary phase of this study involved cross-sectional analyses of comparative risk levels between control and experimental samples. No significant differences in risk levels were noted between the sample of firms receiving consistency qualifications and the related control sample. However, firms receiving uncertainty qualifications consistently exhibited significantly greater levels of unsystematic risk than those firms that received only unqualified opinions. This behavior may logically result from relatively large adjustments of the security's price by the market as a result of changes in perceptions regarding future security returns.

Findings of this study, to the effect that audit opinions qualified for consistency or uncertainty have little informational impact, raise important questions regarding the function of these qualified opinions and serve as a basis for the identification of several related areas of important research.

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CHAPTER I

INTRODUCTION AND PURPOSE OF THE STUDY

Attestation regarding the degree to which a firm's financial statements present fairly the results of operations and financial condition of the firm in accordance with generally accepted accounting principles is among the most basic services provided by the public accounting profession. The profession has historically recognized the communication process as one important aspect of this attest function.

In financial theory, the relevant informational items in the valuation of any asset are the asset's risk and return characteristics. The purpose of this investigation is to measure the informational aspects of selected audit opinion qualifications in terms of their impact on financial measures of risk, the capital market risk components.

Representing an interdisciplinary research effort, the foundation of the study includes salient financial and accounting concepts. In this chapter, these concepts are reviewed and the formal statement of the purpose and expected contributions of the study are delineated.

A. THE CONCEPT OF ATTESTATION

The auditing function and the resultant expression of an opinion by the independent public accountant represents one of the profession's

most important and widely recognized responsibilities.[1] As such, the role of the attest function has been a major concern for the accounting profession.

Upon engagement by the client the auditor performs selected tests and procedures in accordance with generally accepted auditing standards established by the profession. Representing a basic component of professional literature, these standards are broadly classified into three areas: general, field work and reporting.

Among the reporting standards is the requirement that the auditor upon conclusion of the examination must express or disclaim an opinion on the financial statements. An important element of the attest function is the effectiveness of the opinion as a informational process. Following a formal delineation of the applicable reporting standard, selected aspects of the attest function are examined.

The Fourth Reporting Standard

Formal definition of the standard. Representing a generally accepted auditing standard, the fourth reporting standard requires that:

> The report shall either contain an expression of opinion regarding the financial statements, taken as a whole, or an assertion to the effect that an opinion cannot be expressed. When an overall opinion cannot be expressed, the reasons therefore should be stated. (4:80)

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[1]The role and importance of the attest function is noted by Carmichael (22), Lenhart and DeFliese (50), Mautz and Sharaf (56), and Willingham and Carmichael (72).

(1) Application of the standard. The standard, thus, requires the auditor to express or disclaim an opinion upon conclusion of the audit examination. Expressions of opinion have been categorized into three broad types by the accounting profession: adverse, unqualified, and qualified.

(2) Adverse opinion. The auditor renders an adverse opinion when he believes that the financial statements are not fairly presented. Since the occurrence of this type of opinion is infrequent, adverse opinions are not examined in the study (3:10).

(3) Unqualified opinion. In contrast to the adverse opinion, the unqualified opinion indicates that the financial statements present fairly financial position, results of operations, and changes in financial position in conformity with generally accepted accounting principles applied on a consistent basis (3:10).

(4) Qualified opinion. Representing a gradation between the adverse and unqualified opinion, qualified opinions assert that the financial statements present fairly financial position, results of operation, and changes in financial position in conformity with generally accepted accounting principles applied on a consistent basis "except for" or "subject to" the effects of specific matter(s) relating to the qualification (3:10).

Qualified opinions are expressed when there are restrictions on the scope of the examination or a lack of sufficient competent evidential matter, or when the auditor believes that:

a. "the financial statements contain a departure from generally accepted accounting principles, the effect of which is material,

b. there has been a material change between periods in accounting principles or in the method of their application, or
c. there are significant uncertainties affecting the financial statements,

and he has decided not to express an adverse opinion or to disclaim an opinion" (3:10).

Consistency qualifications. As indicated in the fourth reporting standard, the independent auditor must express a qualified opinion when the financial statements of the firm under examination include a material change in accounting principles. Statement on Auditing Standards (SAS) No. 1 requires that:

> Where there is a change in accounting principle, the independent auditor should modify his opinion as to consistency indicating the nature of the change. (4:114)

Uncertainty qualifications. In those cases where significant uncertainties exist that could materially affect the financial statements, the independent accountant must express a qualified opinion. This requirement by the profession, also stated in SAS No. 1, provides that:

> In cases where the probable effects of a matter are not reasonably determinable at the time of the opinion, such as in the case of certain lawsuits, tax matters, and other contingencies, which may have a material effect upon the financial statements, and the final outcome is dependent upon the decision of parties other than management, the independent auditor should appropriately qualify his opinion. (4:121)

Uncertainty qualifications generally result from questions regarding the availability of adequate financing, the outcome of current litigation, realization or valuation of assets, claims in connection

with contracts, or the outcome of tax renegotiation proceedings.[2] These uncertainties generally appear in the financial press prior to the expression of an opinion by the independent accountant. Further, these uncertainties are frequently not resolved for prolonged periods of time, often extending for several years. During the interim, new information regarding the final resolution of the uncertainty is often released. Thus, the audit opinion qualification represents only one of many events regarding the uncertainty that occurs during the period preceding its final resolution.

Selected Aspects of the Role of Attestation

Communicative aspects. Representing a basic service of the profession, attestation serves several important and varied purposes. Among these purposes is the role of the attest function as a communicative process between the independent public accountant and the users of financial statements. Recognizing this characteristic, the Committee on Basic Auditing Concepts of the American Accounting Association states that:

> Opinions and evaluations reached at the conclusion of the audit investigation are generally implicitly stated and communicated by means of an audit report. This phase of auditing is fundamentally a communication process. (1:21)

Also noting that attestation is essentially a communication process, Anderson, Giese, and Booker observe that accounting statements and their accompanying audit opinion are reported to the capital market

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[2] In the 1968-1971 editions of Accounting Trends and Techniques (2), these categories represent 81 percent of all uncertainty qualifications.

which, in turn, uses these reports to evaluate the performance of the firm and the firm's securities (6). Thus, they state that: "Presumably, attestation of the reliability of management's representations of their operations is an essential link in this process of resource allocation" (6:525).

Signification of degree of credibility. In addition to the recognition of the role of attestation as a communication process, the Committee on Basic Auditing Concepts further observes that:

> The purpose of the primary communication process [accounting reports] is to convey relevant information about the subject matter to meet the user's informational needs. The purpose of this secondary communication between the auditor and users is directly related to the primary communication and is aimed at assisting the user in determining the quality of information being received. (1:27-28)

As an indicator of quality, the audit opinion is frequently perceived as an expression of the degree of credibility that is properly associated with the financial statements. In this regard, the Committee states that:

> Auditors have established a series of graded opinions representing a rough expression of varying degrees of credibility. Opinions may be unqualified, qualified for various reasons, adverse, or disclaimed. (1:60)

Carmichael (22) and Anderson, Giese, and Booker (6) also recognize the existence of graded opinions. Anderson, Giese, and Booker rank the unqualified opinion as the best type of opinion with the opinion qualified due to scope, the "except for" opinion (generally, consistency qualifications), the "subject to" opinion (generally, uncertainty qualifications), and the disclaimer of opinion ranking progressively below the unqualified opinion (6). They further note that:

> Given the existence of a set of graded opinions one must ask the question: Do the different grades have any impact on the allocation of resources. (6:525)

Summary

Representing a generally accepted auditing standard of the accounting profession, the fourth reporting standard requires the auditor to express or disclaim an opinion in the audit report. The accounting literature demonstrates that the informational aspects of attestation represent one important role of the function. Recognizing the existence of gradations of audit opinions, this research endeavors to measure informational aspects of consistency and uncertainty audit opinion qualifications, as evidenced by the impact on the financial concept of market-determined risk.

B. FINANCIAL CONCEPT OF RISK

In financial and microeconomic theory, the relevant measures of value for an asset are the asset's risk and return characteristics. For securities traded in the capital market, financial researchers and theorists have developed models to measure security risk levels assigned by the capital market. The market risk components are briefly discussed after the role of risk in asset valuation is developed.

Relevance of Risk to Investors

Indicating the importance of risk and return in asset valuation, the efficient set theorem provides that either for a given level of risk, investors seek to maximize return or for a given level of return,

investors seek to minimize risk.[3] Consequently, those items related to a firm's risk and return characteristics are of relevant informational value to investors.

Noting the importance of risk and return the Financial Accounting Standards Board (FASB) states in the discussion memorandum on the conceptual framework of accounting that "the essence of investment and lending decisions is to balance expected rate of return and expected risk" (36:24). Reflecting this view again in the recent publication, "Scope and Implications of the Conceptual Framework Project," the FASB observes that

> Therein lies the principal role of financial reporting: to furnish the investor and lender with information useful to assess the prospective risk and returns associated with an investment. (35:3-4)

Definition of Risk

In financial literature, the perceived risk of an asset is related to the anticipated uncertainty of that asset's future returns and is broadly defined as ". . . the likely variability of future returns" (71:309). Thus, there is little, if any, perceived investor risk associated with U. S. Treasury Bills since the amount of future returns is stable rather than variable, and the eventuality of that return is certain rather than uncertain. However, for the vast majority of securities, returns are both variable and uncertain, and thus, risk is an important factor in the market valuation of these securities.

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[3] Fama and Miller (34) and Haley and Schall (43) provide excellent developments and discussion of this theorem.

The Capital Market Risk Components

With the development of portfolio theory, the concept of risk has been further examined. Intensive study has prompted the development of two components of risk: unsystematic and systematic risk. Representing the covariability of the security's return to general market conditions, systematic risk cannot be eliminated through diversification. Thus, variability in a security's returns related to market movements comprises the systematic risk component. Alternatively, unsystematic risk represents the portion of risk not related to general market conditions. This risk component results primarily from variability in returns unique to the security and consequently, can be eliminated by the investor through diversification of his portfolio. The systematic and unsystematic risk components comprise total security risk as perceived in the capital market. In the context of an efficient capital market, these risk components provide unbiased estimates of the risk of a security and, as such, are the risk measures utilized in this study.

Summary

In conjunction with security rates of return, measures of risk represent informational items to investors. Prompted by development of portfolio theory, models have been devised to measure the two components of risk, systematic and unsystematic risk. These relevant concepts comprise the financial foundation for this research effort.

C. PURPOSE AND EXPECTED CONTRIBUTION OF THE STUDY

The purpose of this study is to determine the informational impact of consistency and uncertainty audit opinion qualifications as evidenced by their effect on the two components of risk as described above.

An examination of the impact of the attest function should significantly contribute to auditing research and practice. Recognizing the importance of the attest function, the Commission on Auditing Responsibilities, a study group of the American Institute of Certified Public Accountants (AICPA), has included attestation in its delineation of basic issues for consideration. Further, the Commission designates the auditors' responsibilities for reporting on uncertainties and the related formulation of an opinion as specific issues for examination (26). As this research effort examines two selected audit opinion types, consistency and uncertainty qualifications, using an innovative methodological approach, contributions should result from the examination of each type.

Consistency Qualifications

Prior empirical studies of the relationship between consistency qualifications and market-determined measures have focused on unexpected returns.[4] By examining this relationship, researchers have generated

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[4]Such studies include those of Archibald (7), Ball (8), Baskin (11), Kaplan and Roll (48), Scott (61), and Sunder (67). These studies are discussed in detail in Chapter II.

empirical evidence regarding the efficiency of the capital markets and the informational content of the audit opinion qualification. Generally, the evidence has indicated that the consistency qualification has little informational content and has confirmed market efficiency. As noted previously, however, risk also represents a relevant informational item to investors. Thus, by measuring the impact of consistency qualifications on risk, this study represents an alternative approach for a determination of informational aspects of the audit opinion and market efficiency. Such an approach has been suggested by Scott (61) and others in the accounting literature.

Uncertainty Qualifications

Corresponding with the examination of consistency qualifications, the study of the impact of uncertainty qualifications on the capital market risk components will provide empirical evidence regarding informational aspects of this type of audit opinion. Specifically, if the uncertainty qualification indicates a lesser degree of credibility and more uncertainty regarding future returns of the firm and its securities, then changes in the capital market risk levels and possibly return levels should be expected. Thus, this research effort also attempts to measure the informational effect of this opinion type in terms of the impact on risk, a relevant item in asset valuation.

D. SUMMARY

One function of attestation, a basic service of the accounting profession, is its role as a communication process. In financial

theory, the relevant informational items for asset valuation are the asset's return and risk characteristics. This research inquiry attempts to measure the informational aspects of consistency and uncertainty qualifications as evidenced by their impact on the capital market risk components.

Prior research attempted to measure the impact of consistency qualifications on returns. Finding no strong relationship, researchers have concluded that consistency qualifications have little informational content. This research offers an alternative approach for the determination of the informational content of consistency qualifications using market-determined risk measures rather than market-determined returns. Likewise, the study should provide evidence regarding the informational aspects of the other opinions examined in the study, uncertainty qualifications. Summarily, this research endeavor represents an interdisciplinary study that applies the widely-recognized financial concept of market risk components to measure informational aspects of selected audit opinions.

CHAPTER II

REVIEW OF RELATED RESEARCH EFFORTS

As indicated in Chapter I, this study measures informational aspects of selected audit opinions as evidenced by the impact on the capital market risk components. Expanding upon the concepts presented in the preceding chapter, this chapter includes a discussion of relevant prior research and their related implications. The interdisciplinary aspects of using a financial construct to measure the impact of an auditing function requires a focused gleaning of both financial and accounting literatures.

A. RELATED FINANCIAL RESEARCH EFFORTS

Risk components employed in the study to measure the impact of selected audit opinions are determined from the utilization of the market model. As justification for the use of the risk components, the market model and the role of the market risk components in the model are reviewed. Further theoretical support and the mathematical development of the market model and the market risk components are presented in Appendix A.

The Market Model

As proposed by Markowitz (55) and later extended by Sharpe (62), the market model holds that a security's return is a simple linear

function of the market return. This function, as illustrated by Line AB in Figure II-1, is determined by the ordinary least squares procedure of minimizing the squared differences of the observations to the line. Time-series observations of security and market returns are represented by the points in Figure II-1.

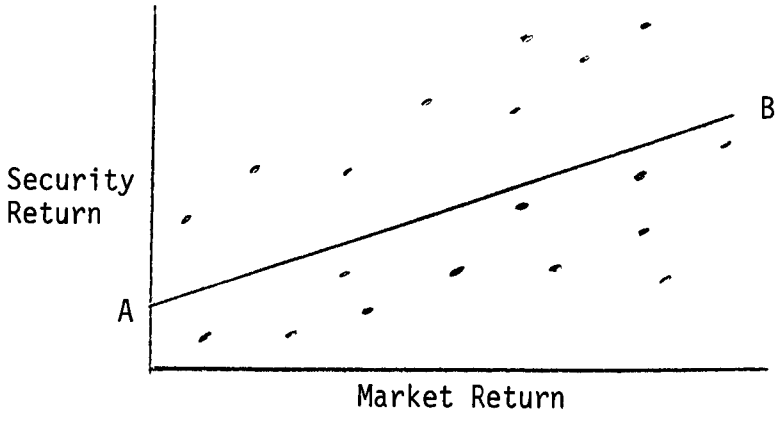


FIGURE II-1. Representation of the market model.

The Market Risk Components

Systematic risk. Risk, defined as the variability of returns, may be categorized in the context of the market model into two components: systematic risk and unsystematic risk. Representing the variability in a security's returns explained by general market movements, systematic risk is defined as the slope of the regression line or beta coefficient. Figure II-2 demonstrates the concept of systematic risk and the differences in this risk component between two hypothetical securities,

Security 1 and Security 2. As illustrated in the figure, the systematic risk of Security 1, B_1, is greater than the systematic risk of Security 2, B_2, since the return of Security 1 is more sensitive to changes in market returns.

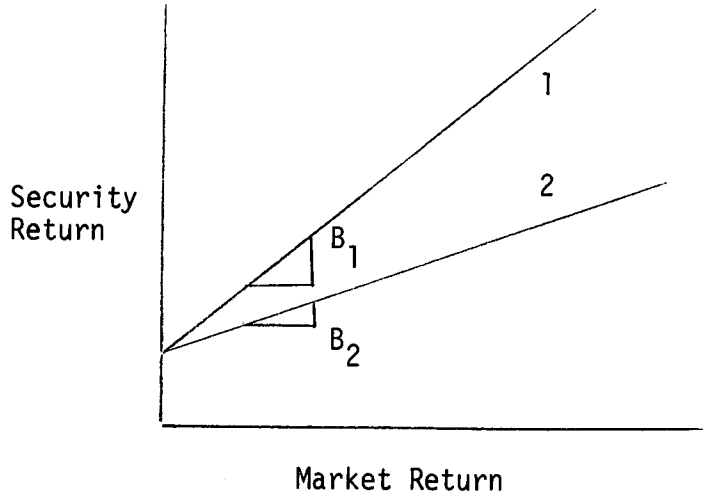


FIGURE II-2. Illustration of differences in systematic risk between securities.

Unsystematic risk. Unsystematic risk represents the variability of a security's return that cannot be explained by general market conditions and is defined as the variance of the residuals of the market model. The residuals, u_{it}, are represented by the distance between the points and the regression line as illustrated in Figure II-3.

As shown in Figure II-3, the residuals are smaller for Security 1 than Security 2. Consequently, the variance of the residuals and the indicated unsystematic risk are less for Security 1 than for Security 2.

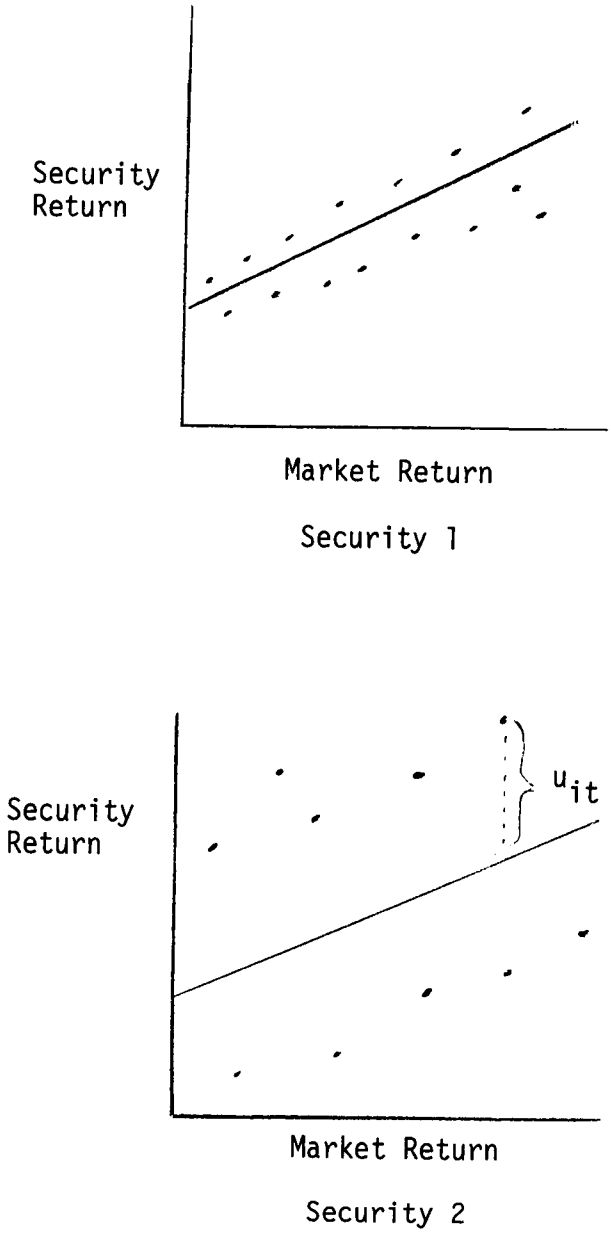


FIGURE II-3. Illustration of differences in unsystematic risk between securities.

B. RELATED ACCOUNTING RESEARCH EFFORTS

Building upon the analysis of the attest function presented in Chapter I, important accounting research efforts related to this study in either objectives or methodology are reviewed. Salient accounting studies may be broadly categorized into three areas: research efforts relating other selected accounting variables to the systematic risk component, studies involving the information content of audit opinions qualified due to changes in accounting principles, and research efforts of the correlation of audit opinion qualifications with selected variables. The review of related accounting research, therefore, includes an examination of the relevant accounting literature in these three areas.

Studies of the Relationship Between Selected Accounting Variables and Systematic Risk

With the development of the concept of systematic risk, researchers have examined the relationship of selected accounting variables to this market risk measure. Typically, these studies have addressed the question of the degree to which selected accounting variables predict future levels of systematic risk.

Beaver, Kettler, and Scholes.

(1) Methodology. Beaver, Kettler, and Scholes (BKS) investigated various accounting determined risk measures to determine if such measures were associated with the market measure of systematic risk (15). They used seven accounting measures of risk including divident payout,

growth, financial leverage, liquidity, asset size, variability of earnings, and covariability of earnings.

(2) Results. Comparing these measures to the market measure of systematic risk as determined by the beta coefficient, BKS found significant associations at the individual security level between beta and the accounting variables of payout, financial leverage, variability of earnings, and covariability of earnings. In addition to this test, they formed portfolios based on (1) accounting risk measures, and (2) the market risk measure to examine the ability of each portfolio to predict future systematic risk. Finding that portfolios formed on the basis of accounting numbers performed as well as the market risk measure in predicting future systematic risk, they concluded that "the evidence supports the contention that accounting measures of risk are impounded in the market price base risk measure" (15:679). BKS further notes that:

> . . . more precisely, a strategy of selecting and ranking portfolios according to the accounting risk measures is essentially equivalent to a strategy of ranking those same portfolios according to the market determined risk measures. (15:679)

(3) Criticisms. Some conclusions of this study have been criticized by Gonedes who notes that the measures of variability of earnings and covariability of earnings used by BKS were income numbers scaled to market price numbers (40). Thus, these two measures are not strictly accounting numbers and, as a consequence, the significant associations between the accounting variability and covariability numbers and the market risk measure may result from the independent and dependent variables representing market price functions.

Beaver and Manegold.

(1) Methodology. Attempting to resolve the same general issue, Beaver and Manegold investigated a variety of specifications to test the association between covariability of earnings ("the accounting beta") and the market risk measure (16). For the examination of the association between the two measures, selected correlation procedures and predictive ability tests were utilized.

(2) Results. Concurring with the results of the BKS study, they found that "across a variety of specifications for accounting and market betas, there is a statistically significant correlation between the two" (16:279). They further noted that this correlation was not caused by scaling of the accounting risk measure to the market price since the effect also existed when non-market measures were used to scale the accounting income numbers. However, Beaver and Manegold also observed that the accounting measure appeared to be only one of many explanatory factors that determined the market risk measure.

Sunder.

(1) Methodology. Developing an engineering and econometric model based on the beta coefficient in the market model, Sunder examined the relationship between changes in inventory valuation methods and stock market response (67). Sunder observed that the average relative risk of firms that had switched to the LIFO inventory method increased slightly while the average relative risk decreased slightly for those firms that changed from LIFO.

(2) Results. Modifying the measurement model to adjust for the observed changes in beta, Sunder examined the residuals around the period of change in inventory valuation methods. He concluded that:

> The results support the hypothesis that changes in market price of stocks are associated with the changes in the economic value of the firms rather than with the changes in reported earnings. (67:314)

In addition, Sunder noted that:

> These results obtained after making adjustment for risk changes are substantially similar to the results obtained by the researcher in a previous study in which adjustment for risk changes was not made. (67:314)

Summary. These studies represent efforts by accounting researchers to determine the extent to which accounting data can be used to evaluate the relative riskiness of firms' securities. Evidence from these studies indicate that accounting numbers do indeed provide information to evaluate the risk of securities. Representing an extension of these research efforts, this study examines communicative aspects of selected forms of attestation, another accounting function as measured by its impact on the systematic and unsystematic risk components.

Studies of the Information Content of Audit Opinions Qualified Due to Changes in Accounting Principles

Several accounting researchers have studied the informational content of changes in accounting principles by measuring market reaction to the announcement of such changes. In an efficient market context, changes in accounting principles have little informational content since these changes generally result in only illusory changes in income. Prior studies have relied upon the residuals of the market

model, or a modified version thereof, to measure stock market reaction.

Archibald.

(1) Methodology. To determine whether the market recognizes that certain changes in accounting techniques result in only illusory income, Archibald utilized the market model to analyze stock price behavior of 65 firms that had changed from an accelerated depreciation method to the straightline method (7). To reduce the effects caused by any unusual movements of a single stock, the market model residuals were averaged across firms to obtain an indicator of market reaction.

(2) Results. Archibald analyzed this average residual for the 24-month periods preceding and following the change in accounting principles. Noting that the analysis offered no conclusive evidence as to the market reaction to changes in accounting principles, Archibald concluded that:

> It is not an easy task to interpret these findings. Unfortunately, the data can be invoked by a believer of either of the competing hypotheses [naive investor hypothesis and the efficienc market hypothesis] in order to support his particular position. (7:28)

Kaplan and Roll. In a paper originally presented at the 1971 American Accounting Association Convention, Kaplan and Roll reported the results of their study into the stock market reaction to firms that changed selected accounting principles (48). As in the Archibald study, Kaplan and Roll employed residuals from the market model to measure market reaction.

(1) Methodology. Two types of accounting changes were selected for examination in the study: changes to the straight-line method of depreciation from an accelerated method and changes to the flow-through method of investment tax credit from the deferred method. Using Accounting Trends and Techniques, Kaplan and Roll identified 275 firms that changed the method for accounting for the investment tax credit and 71 firms that switched depreciation methods. The researchers also identified 57 firms that had not changed their method of accounting for the investment tax credit and, as a consequence, served as a control group. No control group was selected for the experimental sample of firms changing depreciation methods.

(2) Results. Based upon their analysis of the residuals, Kaplan and Roll concluded that changes in the selected accounting principles had little permanent influence on stock prices. They further note that:

> . . . one can conclude that security prices increase around the date when a firm announces earnings inflated by an accounting change. The effect appears to be temporary, and, certainly by the subsequent quarterly report, the price has resumed a level appropriate to the true economic status of the firm. (48:245)

Baskin.

(1) Methodology. Investigating a wider variety of changes in accounting principles than either Archibald or Kaplan and Roll, Baskin employed a somewhat different methodological design to examine market response (11). Baskin divided his sample of 254 firms into three groups: a control group of firms which had not switched accounting

principles and two experimental groups of firms which had changed accounting techniques. The experimental groups were dichotomized on the basis of whether the effects of the change in accounting principles were disclosed with the annual earnings announcement.

(2) Results. Baskin examined the residual or unexpected returns from the market model to measure the informational impact of consistency exceptions in the auditors' opinion. Based upon his analysis, Baskin concluded that "the results . . . suggest that the consistency exception opinion does not appear to have information content for most investors" (11:50). Unfortunately, Baskin appears to have mis-specified his measurement model and, as a result, his conclusions are questionable.[1]

Ball. By selecting 267 firms from Accounting Trends and Techniques that had changed accounting principles during the period 1946-1960, Ball sought to measure the effect of accounting changes that alter net income on security prices (8). As in the studies previously discussed, Ball utilized the market model in his analysis.

(1) Methodology. Noting that the portfolio of firms that changed accounting techniques exhibited consistently poor performance for a substantial period surrounding the date of change, Ball suspected that some assumptions of the market model were being violated. Ball

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[1]Scott, for example, notes that Baskin's examination of the average relative of the residuals appears to be mis-specified by the inclusion of all firms in the sample statistics. Scott states that a dichotomization based on whether the accounting change is included with the annual earnings announcement would be more appropriate (61:32). Unfortunately, the effects of Baskin's measurement error on his conclusions are not determinable.

modified his methodology to test the model's sensitivity to varying regression intercepts. Subsequent analysis indicated that a relaxation of the assumption of a constant regression intercept had no significant effects on the initial results.

Seeking to explain the poor performance pattern, Ball examined the model's assumption of a constant beta coefficient. Testing this assumption, Ball found that the average beta coefficient had indeed increased during the period of analysis. Upon examination, this result is not surprising. Approximately 30 percent of the accounting changes examined by Ball were changes to the LIFO method of inventory valuation. The Internal Revenue Service requires that firms which use LIFO for tax purposes must also use the method in financial reporting. Thus, unlike most other accounting changes, a switch to LIFO could alter cash flows and, therefore, affect the systematic risk level of the security. Consequently, to correct for changing risk levels, Ball used a moving series of observations to obtain the regression parameters for each period of the analysis for the cross-sectional model.[2]

(2) Results. Based upon this modified model, Ball concluded that observed changes in accounting technique were recognized as illusory by the market. He also found that changes in accounting technique "do not appear to be associated with market adjustment in a consistent direction for the average firm" (8:23). He further noted that:

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[2]To compute the ordinary least squares parameters for period t, Ball used 100 observations from period (t-50) through period (t+50) excluding period t.

> . . . most accounting changes are accompanied by an audit qualification in the form of a "consistency exception." The result that a consistency exception does not appear to create any systematic market reaction would be surprising to some. (8:23)

Although Ball's findings represent a significant contribution, implications drawn from the study are somewhat limited by the time frame of his analysis. Current disclosure requirements promulgated by the AICPA were first introduced by Statement of Auditing Procedure (SAP) No. 31 in 1961 and modified by Statement on Auditing Standards (SAS) No. 2 in 1974. Both dates are subsequent to the period of Ball's analysis, 1946-1960.

Scott.

(1) Methodology. In a recent study, Scott utilized the disturbance term of the market model to examine the informational content of audit opinions qualified for changes in accounting principles (61). Scott's sample was composed of selected firms which were identified from Accounting Trends and Techniques as having changed accounting methods during the period 1965-1968. The sample of firms receiving consistency qualifications was dichotomized on the basis of whether the accounting change was disclosed when the earnings announcement was made.

(2) Results. Observing that firms disclosing the change in accounting technique at the earnings announcement date had larger residuals of market reaction, Scott concluded that the consistency disclosure does provide information for market participants and that the "market responds to illusionary earnings created solely by a change in accounting principles" (61:80). Scott recognized the potential bias in

his results due to the assumption of a constant beta coefficient inherent in the market model. Discussing limitations and extensions of the study, he also noted that "the nature of risk changes and their impact on the specification of the market model need additional clarification" (61:99). In addition, Scott raised the question as to "whether the systematic risk coefficient behaves differently for firms exhibiting one kind of accounting change versus another" (61:99).

Summary. Examining the impact of changes in accounting principles on the residuals of the market model or a modified version thereof, these studies have attempted to measure the efficiency of the market based on security returns. Generally, these research efforts have supported the concept of market efficiency and have indicated that consistency qualifications resulting from changes in accounting principles have little informational content. The present study expands upon these prior studies by examining informational aspects of consistency qualifications as evidenced by its impact on risk, the other security valuation component. A summary of these prior studies is presented in Table II-1.

Studies of the Correlation of Audit Opinion Qualifications to Selected Variables

In studies previously discussed the relationship between selected accounting variables and financial market measures were examined. Other studies, however, have related attestation, the relevant accounting function in this study, to non-market determined measures.

TABLE II-1. A summary of related research studies of market reaction to accounting changes.

Researcher	Period of Analysis	Return Period	Maximum Sample Size	Market Index	Model
Archibald	1955-66	Month	65	Fisher's	Log Version of the Market Model
Ball	1947-61	Month	267	Fisher's	Cross-sectional Model
Baskin	1965-68	Week	128	S & P 425[a]	Log Version of the Market Model
Kaplan and Roll	1962-69	Week	403	S & P 425[a]	The Market Model
Scott	1965-68	Daily	62	S & P 425[a]	Log Version of the Market Model
Sunder	1946-66	Month	155	Fisher's	The Market Model

[a]Standard and Poors 425 Industrial Index.

Gosman. Gosman, for example, examined the relationship between consistency exceptions and the selected variables of industry, company size, and auditing firm (42). He determined that the only significant correlation was a positive one between the variable, size of company, and the consistency qualification.

Warren. In a related study, Warren studied the relationship between the issuance of qualified audit opinions and the variables of industry, company size, auditing firm, the direction of changes in earnings, and the presence of extraordinary items (70). Utilizing a different methodological approach than Gosman, Warren concluded that the only significant correlations were positive ones existing between the issuance of the qualified audit opinion and the direction of changes in earnings and the presence of extraordinary items.

Summary. These studies measured the relationship between qualified audit opinions and selected variables. Representing an extension of these studies, this research effort examines the impact of selected audit opinion qualifications on the market components of risk.

C. SUMMARY

As an interdisciplinary research effort, both literatures containing related research studies are examined. The basic measurements of the study, systematic and unsystematic risk, are derived from the market model. The development of the market model and the role and nature of the risk components in the model are presented in the chapter.

Theoretical and mathematical development of the model appear in Appendix A.

Several studies in the accounting literature have examined the relationship of accounting variables other than attestation to the market risk components. In an alternative approach, other accounting researchers have studied the relationship between attestation and selected accounting variables. Expanding upon both types of studies, the present research effort measures one aspect of the relationship between the attest function and the market risk components.

A third group of research inquiries have studied the informational content of audit opinions qualified for changes in accounting principles as measured by market-determined returns. These findings generally support the efficiency of the market and indicate that changes in accounting principles have little informational content. Utilizing market data, the present study differs from these prior studies by examining uncertainty qualifications in addition to consistency qualifications. Further, this research inquiry is based upon market-determined risk measures rather than market-determined returns.

The review of related research efforts in the chapter indicates the interdisciplinary nature of the study and provides justification for the methodological approach utilized as presented in the following chapter.

CHAPTER III

SALIENT THEORETICAL CONSIDERATIONS AND METHODOLOGICAL DESIGN

Recognizing risk as an important valuation factor, this study examines informational aspects of uncertainty and consistency qualifications as evidenced by their impact on the capital market risk components. Earlier discussions of related research studies include an overview of relevant theoretical considerations. The objective of this chapter is to further elaborate on the theoretical foundations for the study and present the research methodology used.

A. SALIENT THEORETICAL CONSIDERATIONS

Representing an interdisciplinary research effort, this study includes reviews of relevant auditing and financial theoretical considerations. A discussion of relevant financial considerations is followed by a presentation of related auditing concepts.

Relevant Financial Considerations

Systematic and unsystematic risk, the relevant measures utilized in the study, are computed by employing a financial measurement model, the market model, that is grounded in the efficient market hypothesis. In this section the efficient market hypothesis and a descriptive summary of the market model, including recognized

limitations, are presented. In addition, the concepts of systematic and unsystematic risk are developed.

The efficient market hypothesis. Numerous studies have investigated stock market reactions to specific accounting and financial data. A basic premise of these studies is that market participants respond quickly and fully to new information. Thus, the market price of a security at any given time will reflect fully a subset of information relevant to the security. Consequently, market participants are unable to devise an investment strategy based on this information subset that will outperform the market. In the financial literature, such a market has been termed as "efficient."

This expectation regarding security market behavior is referred to as the efficient market hypothesis. Three versions of the hypothesis have been formulated based upon the degree to which market prices are assumed to reflect information.[1] The semi-strong version asserts that all publicly-available information is reflected in security prices. Since annual financial statements and audit reports represent publicly-available information, the semi-strong form of the hypothesis is considered the relevant form for this study.

The market model.

(1) Descriptive summary. The formulation of the efficient market hypothesis has prompted the development of several models that

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[1]The three forms of the efficient market hypothesis, the weak, semi-strong, and strong forms, as well as empirical tests of their validity are discussed in Appendix A.

measure the risk and return characteristics of securities and other financial assets. The market model, one of the earlier models developed, is frequently used in accounting and financial research.[2] In this model, a security's return is represented as a simple linear function of the market return. As indicated in Chapter I, the model isolates market reaction to firm-specific data from the security's return movements associated with general market conditions.[3] An assumption of the model is that the covariability between securities is represented by the securities' mutual dependence on the market factor. Although other models have been formulated to measure security characteristics, these models generally utilize the beta coefficient based on a prior computation employing the market model. Thus, representing the primary determinant of beta coefficients in other models, the market model is considered an appropriate technique for the computation of beta in this research study.

(2) Limitations. Although the market model offers a sufficient formulation of the behavior of security returns, the model does have certain limitations. While these limitations do not seriously restrict the scope of the study, a proper evaluation of the results of this research inquiry requires an awareness of these limitations.

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[2]This model was first proposed by Markowitz (55) and later extended by Sharpe (62). Among those studies that have employed the market model are the studies by Archibald (7), Ball and Brown (10), Baskin (11), Beaver (13), Fama, Fisher, Jensen, and Roll (32), and Kaplan and Roll (48).

[3]Theoretical support and the mathematical development of the model are discussed in Appendix A.

Industry effects. Since the market model holds that a security's return is a simple linear function of the market return, effects of any industry factors are ignored. Researchers have shown that although there is some interdependence between returns of securities within an industry, the industry factor accounts for less than 10 percent of the variance of a security's returns.[4] King found that the market factor explained approximately 52 percent of the variance of security returns for the period, 1927-1960, a much larger percentage than explained by the industry factor (49). Based on these findings, most studies including this research effort have considered the market model a sufficient representation of the stochastic nature of securities' returns.

Distribution of residuals. An underlying assumption of the market model is that the residuals of the regression equation are normally distributed with an expected value of zero. Examining the distribution of residuals, several researchers have found that the distribution more closely resembles the stable Paretian family rather than the normal distribution, a more restrictive subfamily of the Paretian distribution.[5] Other researchers, however, have noted that the violation of the assumption of normality generally does not bias the results given

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[4]For example, King (49), Meyers (57), and Cohen and Pogue (25).

[5]Studies of the distribution of the residuals include those of Fama (31, 31), and Mandelbrot (54).

by the model.[6] In this study differences between the two distributions have been assumed to be insignificant.

The concept of systematic and unsystematic risk. Total risk associated with a security as defined in Chapter I is the variability of the security's returns. In the context of the market model, the variance of returns, σ_i^2, is represented by:

$$\sigma_i^2 = B_i^2 \sigma_m^2 + \text{Var}(u_{it}) \qquad \text{(III-1)}$$

where B_i is the beta coefficient from the market model, σ_m^2 is the variance of the market returns, and $\text{Var}(u_{it})$ is the variance of the residuals of the market model.[7] Equation (III-1) holds that the variance of a security is composed of two parts: a systematic risk component, $B_i^2 \sigma_m^2$, and an unsystematic risk component, $\text{Var}(u_{it})$. Systematic risk represents movement in the security's returns related to general market conditions and, as a consequence, cannot be diversified away. Denoting that portion of risk unrelated to general market conditions, unsystematic risk is presumed to result from variations in the security's returns caused by firm-unique factors.

(1) Systematic risk. Since the variance of the market return, σ_m^2, is constant across all securities the beta coefficient, B_i, becomes

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[6]For example, Black, Jensen, and Scholes (17) note that the least squares procedure used in the market model is not inappropriate in the presence of the stable distribution.

[7]Derivation of Equation (III-1) is also included in Appendix A.

the relevant measure of systematic risk for a security. Theoretically, the representation of the beta coefficient of security i is:

$$B_i = \frac{Cov(R_{it}, R_{mt})}{\sigma_m^2} \quad . \qquad \text{(III-2)}$$

(2) Computation. In many empirical studies[7] beta has been estimated by fitting time-series data of security and market returns to the simple linear regression equation of the market model. The beta derived from the market model will approximate Equation (III-2) assuming that the beta coefficient is stationary over the time period of the regression analysis.

(3) Stability. Although this assumption has been made in most empirical work, some researchers have found evidence that the assumption is not always valid. Blume examined the relative stability of beta coefficients for single stocks and portfolios of various sizes using rank-order and product-moment correlation techniques (18). Computing betas from the market model over six consecutive seven-year periods, Blume compared correlations over time for individual securities and portfolios formed on the basis of the tanking of security betas in the first period. He found that correlation coefficients of the betas of individual securities were about 0.60 over time while the correlation coefficients of portfolios of ten stocks were around 0.90. The Blume

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[8]For example, Archibald (7), Ball (8), Ball and Brown (10), Baskin (11), Beaver (13), Beaver, Kettler, and Scholes (15), Blume (18), Fama, Fisher, Jensen, and Roll (32), Kaplan and Roll (48), and Scott (61).

study indicates that although there is some instability of beta over time at the individual security level, the behavior of beta at the portfolio level is remarkably stable.

In an exhaustive study of the time-series behavior of beta coefficients for individual securities, Sharpe and Cooper concluded that "there is substantial stability [of beta] over time, even at the level of individual securities" (63:54). The correlation coefficients obtained in the study, however, exhibited some degree of volatility and were consistent with the individual security correlation coefficients obtained by Blume. Regarding the conclusions reached by Sharpe and Cooper, Dyckman, Downes, and Magee note that the data from the study ". . . are consistent with viewing the stability assumption as at best an approximation" (27:61).

Several other studies have investigated the behavior and stability of beta coefficients over time. Using an approach similar to Blume, Levy found correlations that ranged from below 0.50 for individual securities to about 0.85 for ten-stock portfolios (51). Examining the stability of betas during the time period 1950-1967, Meyers concluded that:

> . . . depending on how one defines stationarity, the beta coefficient was stationary for no more than 75 per cent and possibly as few as 50 per cent of the stocks on the New York Stock Exchange between 1950 and 1967. (58:321)

Summarily, the evidence from these studies indicates that there is some instability in the behavior of beta coefficients over time at the individual security level. However, as the number of securities in the portfolio increase, the portfolio beta becomes quite stable.

Although some instability in beta is expected in this research endeavor, the occurrence of this phenomenon is not expected to differ between the experimental and control samples. Consequently, no adjustment for instability of beta ia made in this research effort.

(4) Mean-regression phenomenon. Another statistical phenomenon, the mean-regression tendency, that affects the time-series behavior of beta coefficients has been observed by Blume (18, 19) and Levy (51). Specifically, they observed that very high and very low betas both tended to regress towards one over time.[9] Although Blume (18) has proposed a method to correct for this tendency, unless the researcher has a sample which includes very high or very low beta coefficients the mean-regression phenomenon generally will not seriously bias the results. Extremely high and low betas are not expected in this study and, as a consequence, no adjustment of the data is made for the mean-regression tendency.[10]

(5) Appropriate data and time spans. Questions have also been raised regarding the appropriate data and time spans to use in the computation of the beta coefficient in the market model. In much empirical work, monthly data have been used. Not only are monthly data

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[9]The beta coefficient represents the covariability of the security or portfolio return to the market return. Thus, for the market portfolio, the beta coefficient would be one. Consequently, most individual security's beta coefficients center around one.

[10]Subsequent data collection and analyses indicate that approximately 3 percent of the betas were less than 0.50 and another 3 percent were above 2.00.

usually more convenient but its utilization in the market model explains roughly 30-40 percent of the variability of a security's return. This percentage is much higher than the 15 percent of variability explained using weekly data. Appropriate time spans for the regression analysis have also been empirically investigated. Gonedes has found that for monthly data the parameters of the market model at the individual security level are not stable for time periods longer than five to seven years (39). However, the time frame of the market model computations has varied tremendously among different empirical studies.[11] The utilization of monthly data over 37-month time periods as subsequently noted in the research methodology is, thus, considered adequate.

(6) Unsystematic risk. Although systematic risk has been the risk measure utilized in most empirical work, the importance of unsystematic risk should not be overlooked. Even though unsystematic risk represents risk that can be eliminated through diversification, this risk component represents an important factor in security valuation for poorly diversified investors. Equation (III-1) illustrates that unsystematic risk, as computed by the variance of the residuals from the market model, denotes risk unrelated to general market conditions. Representing variability in the security's returns that cannot be explained relative to the market factor, unsystematic risk is generally determined by firm-specific elements rather than common economic events.

Computationally, unsystematic risk is:

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[11] Time periods of computations, for example, has ranged from 65 weeks in Baskin's study (11) to 204 months in the study by Archibald (7).

$$\text{Var}(u_{it}) = \frac{\sum_{t=1}^{n} (u_{it})^2}{n-2} \qquad \text{(III-3)}$$

where n represents the total number of observations. The sum of the squared residuals is divided by (n-2) since two degrees of freedom are lost in the ordinary least squares regression. Since the mean or expected value of the residual is zero, the residuals themselves may be squared rather than performing the usual statistical procedure of squaring the mean differences.

Relevant Auditing Concepts

The objective of this study is to examine informational aspects of uncertainty and consistency qualifications. Expanding upon the role of these audit opinion qualifications presented in Chapter I, this section further pursues the development of this important underlying consideration.

Uncertainty qualifications. Issuance of an audit opinion qualified due to uncertainty indicates the occurrence or possibility of an occurrence of an event that could have a significant impact on the firm's accounting numbers. Uncertainty qualifications are generally issued subject to availability of adequate financing, outcome of current litigation, realization or valuation of assets, claims in connection with contracts or the outcome of tax renegotiation proceedings.[12]

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[12]These categories represent 81 percent of all uncertainty qualifications in the 1968-1971 editions of Accounting Trends and Techniques and 100 percent of uncertainty qualifications included in the subsequent analyses of this study.

Occurrence of these events could clearly have an impact on the returns of the firm's securities.

Generally, outcomes of such events are not dependent on macroeconomic conditions but rather are firm-specific.[13] In that regard, Carmichael notes in Auditing Research Monograph No. 1 that the resolution of many types of uncertainties, including most types examined in this study, are:

> . . . not attributable to general economic events occurring subsequent to the date of financial statements, but rather to some future specific events. . . . For example, renegotiation proceedings, utility revenue rate cases, and litigation of claims for damages are resolved by processes outside the market place. . . . (22:70-71)

Since qualifications due to litigation or tax renegotiations represent events whose outcomes generally do not depend on macroeconomic events, one may infer that losses resulting from the settlement of these proceedings do not alter the underlying covariability of the firm's returns to the market return. Likewise, valuation or realization of assets generally do not represent events whose outcomes are dependent upon general economic conditions. Most of these qualifications result from contract disputes (receivables) or uncertainties regarding the disposition of a firm's property in a foreign nationalization.[14] Consequently, these outcomes are not dependent upon market-wide conditions. These

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[13]Outcome of an uncertainty regarding the availability of adequate financing, however, may indeed be dependent upon general economic conditions. The sample selected in this study does not include firms receiving such qualifications.

[14]Four firms included in the analyses received uncertainty opinions qualified subject to valuation or realization of assets. All of these qualifications resulted from the above mentioned reasons.

expectations are incorporated in the hypotheses regarding uncertainty qualifications as subsequently described in the chapter.

Consistency qualifications. In addition to the examination of firms receiving uncertainty qualifications, firms receiving consistency qualifications due to changes in accounting principles are also studied. Most changes in accounting principles are considered illusory in the sense that such changes affect accounting income but have no impact on the economic income or value of the firm. These changes in accounting principles, therefore, should have little impact on the firm's market measured returns or the variability of these returns. These expectations are reflected in the development of the hypotheses regarding consistency qualifications as subsequently described in the chapter.

Overview of Salient Theoretical Considerations

Financial and auditing considerations relevant to this effort have been developed in greater depth in this section. The effect of several potential limitations in the use of the market model were explored. The specific structure of this study and the characteristics of the data, however, indicate that these limitations should have no significant effect on the results of the study. Consequently, no adjustment for the limitations are made in the study.

Characteristics of uncertainty and consistency audit opinion qualifications are also examined. Generally, outcomes of events that necessitate the issuance of an uncertainty qualification are not dependent upon macroeconomic conditions but rather are firm-specific. Most consistency qualifications result from changes in accounting

principles that affect accounting income but have little impact on the economic income of the firm. These generalizations are reflected in the subsequent formulation of the hypotheses.

B. RESEARCH METHODOLOGY

To measure informational aspects of consistency and uncertainty qualifications, the market model and appropriate measurement procedures to test hypotheses regarding firms selected on the basis of the sample design are utilized. Representing the study's research methodology, these factors are discussed in depth in this section.

Application of the Market Model

Use of the market model requires definitions of appropriate market and security returns and designation of the time-frame for the analyses.

Log_e of the price relative. For the measurement of returns, this study utilizes the natural logarithm of the return relative, a linear translation of the rate of return that equals the rate of return plus one. The relative offers certain advantages in that it is always greater than zero and has a natural logarithmic ($\log_e$) equivalent. As with several studies discussed in the preceding chapter, the natural logarithm is used in this research effort since its use, in effect, provides for continuous compounding of returns.

The relative of the return on security i in period t, R_{it}, is defined as:

$$R_{it} = \frac{P_{it} + D_{it}}{P_{it-1}} \qquad \text{(III-4)}$$

where P_{it} is the market price of security i at the end of period t, D_{it} is the cash dividend paid on security i in period t, and P_{it-1} is the market price of security i at the end of period (t-1) adjusted for capital changes in period t.

The market factor. The Standard and Poors Industrial Index of 425 stocks (S and P 425) is used as the market index. The relative of the market return is the value of the index at the end of the period divided by the index at the beginning of the period. Some prior empirical work has employed alternative indices although other studies have used the S and P 425 index. In a study by King (49), the Standard and Poors Industrial Index was highly correlated with the market factor identified in his analysis. For the period, June, 1927 to December, 1960, the reported correlation was 0.97.

Time frame of the computations. To analyze the systematic and unsystematic risk components, the lease squares regression from the market model must be computed for selected periods using time-series data. Month M_0 was defined as the date of issuance of the audit report under examination and represents one period in which the risk components will be computed. To measure changes in the risk levels over time, the market risk components must also be computed for periods prior and subsequent to the audit report.

Since the market model employs a time-series analysis of returns, care must be exercised in selecting periods prior and subsequent to the audit report so that observations that overlap with observations used in the computations for month M_0 are minimized. Common observations in the periods under examination could result in measurement error regarding the impact of firm-specific events and thus, bias the results. However, minimization of common observations must be tempered by the need to have an appropriate number of observations for the analysis and yet have the periods close enough so that firm characteristics are stable. Based upon these factors, 36 months was selected as an appropriate time period for examination prior and subsequent to month M_0. These months, symbolically represented by M_{-36} and M_{36}, are the periods used to measure changes in systematic and unsystematic risk levels over time.

Thirty-seven observations were selected for the computations for each regression line since this provides an appropriate number of observations and minimizes common observations. Figure III-1 indicates each of the 73 months in which the market model is employed and the 37 observations used in each regression analysis. Systematic risk as given by the beta coefficient and unsystematic risk as measured by the variance of the residuals are computed by employing the market model and 37 monthly time-series observations centered around the appropriate examination month.

Development of Hypotheses

The primary objective of the study is to measure the impact of uncertainty and consistency qualifications on the market risk

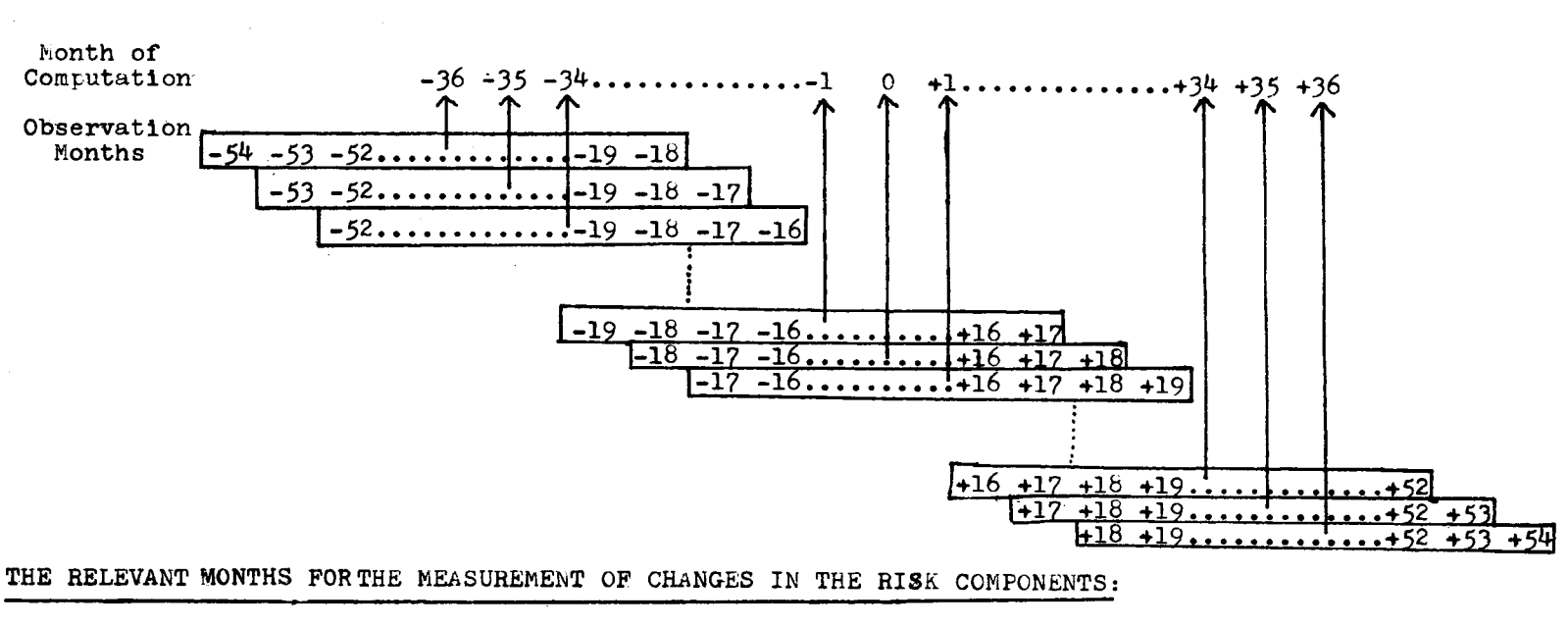


FIGURE III-1. Schematic representation of the months for which computations are made and the appropriate observations used in these computations.

components. Consequently, hypotheses regarding each type of qualification are developed. Formal statements of the hypotheses are presented in the following chapter.

Consistency qualifications. Generally, changes in accounting principles are illusory in the sense that they affect accounting income but have no impact on the economic income of the firm.[15] Consequently, changes in accounting principles should have little impact on the security's returns or the variability of those returns. Thus, behavior of the systematic and unsystematic risk components are not expected to differ over time between securities of firms changing accounting principles and securities of other firms. Expectations regarding the impact of consistency qualifications on the capital market risk elements represent the first of two major sets of hypotheses to be tested in the study.

Uncertainty qualifications. Since outcomes of events that necessitate the issuance of uncertainty qualifications seldom depend upon general economic conditions, the issuance of such qualifications should have only a minimal impact on the systematic risk of the firm's securities. Although changes in beta coefficients have been observed by several researchers, changes are not expected to be more prevalent for firms receiving uncertainty qualifications than for other firms.

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[15]Changes in accounting principles are considered illusory in the sense that the changes do not affect cash flows. This assumption has been made in most studies, including this one.

Events that necessitate uncertainty qualifications may indeed be reflected in the market's assignment of unsystematic risk levels. Since these events are generally firm-specific and indicate increased variability of returns, a larger level of unsystematic risk is anticipated. Although a greater measure of unsystematic risk would be expected across time for securities of firms receiving uncertainty qualifications, there is no strong reason to expect changes in the unsystematic risk level to be more prevalent for securities of these firms. Generally, events which prompt uncertainty qualifications are known by the market for some time before the qualified audit opinion is rendered by the independent accountant. Further, firms that receive uncertainty qualifications may exhibit certain characteristics (e.g., substantial and volatile foreign investments) which cause a continued greater degree of unsystematic risk. Thus, although these firms should experience larger unsystematic risk levels across time, changes in this risk component should not be more widespread for securities of firms receiving uncertainty qualifications than for securities of other firms. These expectations regarding the impact of uncertainty qualifications on the capital market risk components provide the orientation for the second set of hypotheses examined in the study.

Measurement Procedures

The hypotheses developed in this study are tested using time-series analyses of the measurement variables. Two measurement procedures are utilized: (1) the frequency of significant risk changes, and (2) the frequency of risk level changes.

Significant risk changes. Frequency of significant risk changes measures the number of firms in each sample that experience changes over time in the appropriate risk component, the magnitude of which is statistically significant.

Risk level changes. Frequency of risk level changes measures the number of firms in each sample that experience either increases or decreases over time in the appropriate risk component. Here, the relative magnitude of such changes is disregarded; the key phenomenon is the frequency and direction of such changes. The pattern of all changes, whether otherwise statistically significant or not, is of concern here.

Sample Design

To examine the hypothesized relationships, samples of firms receiving consistency qualifications, uncertainty qualifications, and unqualified opinions must be selected. After the initial population of firms are identified, selected criteria are applied for the final determination of the samples' composition.

Initial source of identification. Each year the American Institute of Certified Public Accountants (AICPA) publishes Accounting Trends and Techniques (ATT), a survey of the accounting and reporting practices of 600 industrial and retail firms as presented in the firms' annual reports to the stockholders. Firms selected for the survey are those that the AICPA believes are representative of American companies. The surveyed firms generally continue to appear in ATT as long as the firms remain viable going concerns and distinct business entities.

Primarily, the securities of firms surveyed in ATT are traded on the New York Stock Exchange (NYSE) and thus, are representative of the largest, most visible group of American business enterprises. Although the characteristics of these firms are not indicative of all American companies, they nonetheless are representative of large American companies whose securities are widely traded and for which information is widely disseminated. Consequently, one would expect the securities market for NYSE firms to exhibit a high degree of efficiency as compared to other capital markets. In this regard, Blume and Friend have noted that although the market model has not worked well as an explanation of returns on all financial assets, the model has been "a tenable approximation of the empirical relationship between return and risk for NYSE stocks over the period [1955-1968] covered" (20:26). Accordingly, the firms listed in ATT provide an appropriate basis for the population of the study.

Screening criteria.

(1) General criteria. Firms in ATT during the years 1968-1971 are identified for initial inclusion in the samples. Table III-1 presents the number of firms in ATT for each of the four years receiving the various types of audit opinions. This time frame is selected for the analyses since it represents a relatively recent period with a large number of audit opinion qualifications.

To ensure that stock price and divident data are readily available, each firm is required to be included in either the CRSP monthly

TABLE III-1. Frequency distribution of audit opinion types.

Description	ATT Annual Edition			
	1968	1969	1970	1971
An Unqualified Opinion	547	513	510	515
A Qualified Opinion	52	86	90	83
A Disclaimer of Opinion	1	1	0	2
Totals	600	600	600	600

tape or the COMPUSTAT quarterly tape.[16] This requirement eliminates only two firms each from the samples of firms receiving either consistency or uncertainty qualifications. After applying subsequent requirements, data sources for the final samples are presented in Table III-2.

(2) Opinion pattern requirements. To isolate the impact of the opinion qualification, the sample of firms were limited to those that (1) received only unqualified opinions for each year of the analysis except the qualification year and (2) received no multiple qualifications. Since the time frame of the analysis for each firm covers seven years, firms selected for examination are required to be included

[15]The CRSP (Center for Research in Security Prices) tapes of the Graduate School of Business at the University of Chicago include monthly stock and return data for NYSE firms for the period 1926-1976. The COMPUSTAT quarterly tapes contain detailed financial information as well as monthly security prices and quarterly dividends. The COMPUSTAT tapes are maintained by Investors Management Services, Denver, Colorado.

TABLE III-2. Summary of data sources for each sample.

Sample	CRSP Tapes	COMPUSTAT Tapes	Total
1	58	1	59
2	19	1	20
3	52	7	59
4	20	0	20
Totals	149	9	158

in ATT for a similar period (three years prior and subsequent to the appropriate audit report and the year of the audit report) to facilitate the determination of the firm's opinion pattern. As the examination period covers the four year period, 1968-1971, the study includes an examination of ten editions of ATT (1965-1974) even though firms under consideration for the samples are required to be in only seven editions.

Although the requirement of three unqualified opinions before and after the audit qualification does not represent a critical limitation for firms receiving consistency qualifications (Sample 1), the restriction severely limits the sample size of firms that received uncertainty qualifications (Sample 2). In most cases, firms that receive a qualified audit opinion for uncertainty continue to receive such qualifications for several years after the initial qualification. Due to this factor, no restriction is placed on subsequent audit opinions for those firms that received uncertainty qualifications.

In the listings of ATT, accounting principle changes are reported in the financial statements in one of two ways. Comparative data can be left as originally reported and the effect of the change on the current period's statements provided. In this case, the audit opinion would state that accounting principles have been consistently applied "except for" the accounting change. Alternatively, accounting changes may be reported by restating data pertaining to prior periods in accordance with the newly adopted accounting principles and disclosing effects of such restatements. In this instance, the opinion would report that accounting principles have been consistently applied "after restatement" for the accounting change. In this research endeavor, both types of audit opinions are considered consistency qualifications.

Control samples (Sample 3 and Sample 4) of firms receiving only unqualified opinions are also selected. These firms are randomly selected from 121 firms that received unqualified opinions during the span of the ATT analysis, 1965-1974, and are randomly assigned to the control samples. Years for examination of the audit report for firms receiving only unqualified audit opinions are paired randomly so that the years under examination per ATT match between the qualified opinion samples and the control samples. Allowable opinion patterns for firms in the four samples are shown in Table III-3. The number of firms comprising each of the four samples, the frequency of firm selection from editions of ATT, and the frequency of the firms' fiscal year ends are illustrated in Table III-4.

TABLE III-3. Summary of audit opinion patterns.

Sample	ATT Year 1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Experimental										
1	0	0	0	QC	0	0	0	-	-	-
	-	0	0	0	QC	0	0	0	-	-
	-	-	0	0	0	QC	0	0	0	-
	-	-	-	0	0	0	QC	0	0	0
2	0	0	0	QU	-	-	-	-	-	-
	-	0	0	0	QU	-	-	-	-	-
	-	-	0	0	0	QU	-	-	-	-
	-	-	-	0	0	0	QU	-	-	-
Control										
3,4	0	0	0	0	0	0	0	0	0	0

NOTE: Key--0 = Unqualified Opinion; QC = Qualified Opinion due to one change in accounting principles; and QU = Qualified Opinion due to one uncertainly item.

TABLE III-4. Summary of samples and the edition in ATT.

Sample	Month	Edition in ATT 1971	1970	1969	1968	Total
1	Jan.	1	0	1	1	3
	Feb.	1	0	0	0	1
	March	0	0	0	1	1
	April	0	0	1	0	1
	May	0	1	0	0	1
	June	1	0	0	0	1
	July	1	0	1	0	2
	Aug.	0	0	1	0	1
	Sept.	1	2	1	1	5
	Oct.	0	0	2	0	2
	Nov.	0	1	1	0	2
	Dec.	9	7	10	13	39
	Total	14	11	18	16	59
3	Jan.	0	0	1	0	1
	Feb.	0	0	1	0	1
	March	0	0	1	1	2
	April	0	0	0	0	0
	May	0	0	0	0	0
	June	0	0	1	0	1
	July	0	1	0	0	1
	Aug.	0	1	0	1	2
	Sept.	2	1	1	0	4
	Oct.	0	1	0	2	3
	Nov.	1	0	0	0	1
	Dec.	11	7	13	12	43
	Total	14	11	18	16	59
2	Jan.	0	0	0	0	0
	Feb.	0	0	0	0	0
	March	1	0	0	0	1
	April	0	0	0	0	0
	May	0	0	0	0	0
	June	1	0	0	0	1
	July	0	0	0	0	0
	Aug.	0	0	0	0	0
	Sept.	0	0	1	0	1
	Oct.	1	0	1	0	2
	Nov.	0	0	0	0	0
	Dec.	5	5	1	4	15
	Total	8	5	3	4	20

TABLE III-4. (continued)

Sample	Month	Edition in ATT				
		1971	1970	1969	1968	Total
4	Jan.	0	0	1	0	1
	Feb.	1	0	0	0	1
	March	0	0	0	0	0
	April	0	0	0	0	0
	May	0	0	0	0	0
	June	1	0	0	0	1
	July	0	0	0	0	0
	Aug.	0	2	0	0	2
	Sept.	0	0	0	0	0
	Oct.	1	0	0	0	1
	Nov.	0	0	0	0	0
	Dec.	5	3	2	4	14
	Total	8	5	3	4	20

NOTE: The 1968 edition of ATT surveyed annual reports for the year ending not later than January 10, 1968. The 1969, 1970, 1971 editions surveyed reports for the years ending not later than February 10.

Determination of audit report dates. Although the fiscal year end of all companies surveyed is noted in ATT, the date of issuance for each firm's audit report is not given. Generally, the audit report is issued from four to eight weeks subsequent to the company's fiscal year end. In some circumstances, however, the date of issuance of the audit report can significantly differ from this pattern. To ascertain the date of the audit report under examination, the appropriate annual report and audit opinion of each firm are examined. The date of the audit report is defined as month M_0 and is illustrated in Table III-5 for each firm in the four samples. Dates in this table differ from those in Table III-4 due to variations between the release of the audit opinion and the fiscal year end among firms.

Overview of Research Methodology

This section further develops the research methodology used to measure the impact of uncertainty and consistency qualifications on the market risk components. Justification for the specifications of the market model, the development of hypotheses, the measurement procedures, and sample design are presented and discussed.

C. SUMMARY

This chapter presents the detailed theoretical basis and the research methodology utilized to determine informational aspects of selected audit opinion qualifications as measured by the impact on the market risk components.

TABLE III-5. Summary of the month of issuance of the audit report (M_0) for each sample.

Sample	Month	Fiscal Year Ending in 1971	1970	1969	1968	1967	Total
1	Jan.	2	4	2	0	0	8
	Feb.	7	2	7	11	0	28
	March	1	3	1	3	0	8
	April	0	1	0	0	0	1
	May	0	0	0	0	1	1
	June	0	0	0	1	0	1
	July	0	0	1	0	0	1
	Aug.	0	0	0	0	0	0
	Sept.	0	2	0	0	0	2
	Oct.	0	0	0	2	0	2
	Nov.	0	1	1	1	1	4
	Dec.	0	0	1	2	0	3
	Total	10	13	14	20	2	59
3	Jan.	5	2	5	4	0	16
	Feb.	6	4	7	4	0	21
	March	2	0	2	4	0	8
	April	0	0	0	1	0	1
	May	0	0	0	2	0	2
	June	0	0	0	0	0	0
	July	0	0	0	0	0	0
	Aug.	0	0	0	1	0	1
	Sept.	0	0	1	0	0	1
	Oct.	0	0	1	1	1	3
	Nov.	0	2	2	0	1	5
	Dec.	0	0	0	0	1	1
	Total	14	8	18	17	3	59
2	Jan.	2	0	0	1	0	3
	Feb.	2	3	1	0	0	6
	March	2	2	0	3	0	7
	April	0	0	0	0	0	0
	May	0	1	0	0	0	1
	June	0	0	0	0	0	0
	July	0	0	0	0	0	0
	Aug.	0	1	0	0	0	1
	Sept.	0	0	0	0	0	0
	Oct.	0	0	0	1	0	1
	Nov.	0	0	0	0	0	0
	Dec.	0	0	0	1	0	1
	Total	6	7	1	6	0	20

TABLE III-5. (continued)

Sample	Month	Fiscal Year Ending in 1971	1970	1969	1968	1967	Total
4	Jan.	3	1	0	1	0	5
	Feb.	2	1	2	2	0	7
	March	0	1	1	1	0	3
	April	0	1	0	0	0	1
	May	0	0	0	0	0	0
	June	0	0	0	0	0	0
	July	0	0	0	0	0	0
	Aug.	0	1	0	0	0	1
	Sept.	0	0	0	0	0	0
	Oct.	0	0	2	0	0	2
	Nov.	0	0	0	0	0	0
	Dec.	0	1	0	0	0	1
	Total	5	6	5	4	0	20

The concurrent evolvement of the efficient market hypothesis and the market model has resulted in the development of the concepts of systematic and unsystematic risk components. Systematic risk or non-diversifiable risk is measured by the beta coefficient. Unsystematic risk, however, represents risk that can be eliminated through diversification and is measured by the variance of the residuals. Certain limitations regarding the omission of industry effects and the distribution of the residuals of the market model, the instability of beta over time, and the mean-regression tendencies in beta have been observed by several researchers. These limitations are not expected to have a significant impact on the results of the study and consequently, no adjustments for these phenomena are made.

Two types of audit opinions, consistency and uncertainty qualifications, are examined in the study. General characteristics of these opinions are utilized to develop the anticipated impact of each type of opinion on the market risk components.

To examine the risk components, unsystematic and systematic risk are computed using certain specifications of the market model for securities of each firm for each of the 73 months surrounding the month of the appropriate audit report. For each of the 73 firm regression lines, 37 time-series observations centered around the month under examination are used. Changes in risk are measured for two time intervals, M_{-36} to M_0 and M_0 to M_{36}, using two measurement procedures: (1) frequency of significant risk changes, and (2) frequency of risk level changes. Hypotheses regarding each type of audit opinion qualification are

also developed. Formal statements of the hypotheses, however, along with data analyses are presented in the following chapter.

Samples are selected from the 1968-1971 editions of ATT applying certain general and opinion pattern criteria. Samples of firms receiving consistency qualifications, firms receiving uncertainty qualifications, and control samples of firms receiving only unqualified opinions are formed.

CHAPTER IV

HYPOTHESES AND DATA ANALYSES

Following an overview of the research and a review of the related literature, the preceding chapter further develops relevant auditing and financial concepts and presents the research methodology used including descriptions of the hypotheses to be tested. In this chapter, the measurement techniques for the appropriate intervals as stated in Chapter III are utilized to test the hypotheses. Chapter IV contains formal statements of the hypotheses and the presentation, analyses, and testing of the data.

A. HYPOTHESES AND DATA FOR TIME-SERIES ANALYSES

Formal Statements of Hypotheses

Generically, this research is an attempt to determine the informational impact of certain audit opinions on systematic and unsystematic risk. Expanding upon the relationships developed in Chapter III, hypotheses regarding the expectations of the impact on each of the capital market risk components are formally stated. A matrix of the variables incorporated in these hypotheses and the related indicators of the appropriate data presentation is shown in Figure IV-1.

Systematic risk. As developed in the preceding chapter, the behavior of systematic risk over time is not expected to differ between

	RISK COMPONENTS			
	Systematic		Unsystematic	
	M_{-36} to M_0	M_0 to M_{36}	M_{-36} to M_0	M_0 to M_{36}
CONSISTENCY QUALIFICATIONS				
Frequency of Significant Risk Changes	H_{SC1} Data Matrix 1	H_{SC2} Data Matrix 2	H_{UC1} Data Matrix 9	H_{UC2} Data Matrix 10
Frequency of Risk Level Changes	H_{SC3} Data Matrix 5	H_{SC4} Data Matrix 6	H_{UC3} Data Matrix 13	H_{UC4} Data Matrix 14
UNCERTAINTY QUALIFICATIONS				
Frequency of Significant Risk Changes	H_{SU1} Data Matrix 3	H_{SU2} Data Matrix 4	H_{UU1} Data Matrix 11	H_{UU2} Data Matrix 12
Frequency of Risk Level Changes	H_{SU3} Data Matrix 7	H_{SU4} Data Matrix 8	H_{UU3} Data Matrix 15	H_{UU4} Data Matrix 16

FIGURE IV-1. Schematic of variables incorporated in the hypotheses and related data matrices for the time-series analyses.

firms receiving either uncertainty or consistency qualifications and firms receiving unqualified audit opinions. To test these expectations, two sets of hypotheses are developed to determine whether significant differences exist between the samples in regard to the frequency of firms experiencing (1) significant risk changes over time, and (2) risk level changes over time.

(1) Significant risk changes. Since most changes in accounting principles only have an illusory effect on income consistency qualifications are expected to have little impact on systematic risk. Accordingly, the following hypotheses are formulated as a basis for testing whether the frequency of significant changes in systematic risk significantly differs between firms receiving consistency qualifications and firms receiving unqualified audit opinions.

H_{SC1}: Frequency of significant changes in systematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{SC2}: Frequency of significant changes in systematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

As in the case of consistency qualifications, frequency of significant changes in systematic risk is not expected to significantly

differ between firms receiving uncertainty qualifications and firms receiving unqualified audit opinions. To test this expectation, the following hypotheses are developed:

H_{SU1}: Frequency of significant changes in systematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

H_{SU2}: Frequency of significant changes in systematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

(2) Risk level changes. The formulation of the preceding four hypotheses provides for the measurement of frequency of significant changes but does not indicate whether significant differences exist between the samples regarding frequency of increases and decreases. A preliminary examination of the data indicated that very few firms experienced significant changes in systematic risk over the time periods studied. Although the firms in any sample may experience changes in beta in a consistent direction, if the changes are not of a magnitude to indicate a significant change then the phenomenon of changes in beta in a consistent direction would not be detected. Accordingly, to test the data for this occurrence the following four hypotheses are developed:

H_{SC3}: Frequency of increases and decreases in systematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{SC4}: Frequency of increases and decreases in systematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{SU3}: Frequency of increases and decreases in systematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

H_{SU4}: Frequency of increases and decreases in systematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

Unsystematic risk. Coupled with systematic risk, unsystematic risk comprises the total risk of a security's returns. As developed in Chapter III, the issuance of either consistency or uncertainty qualifications is not expected to have a significant impact on unsystematic risk. To determine the impact on this risk component, hypotheses are

developed to examine whether significant differences exist between the samples in regard to the frequency of firms experiencing (1) significant risk changes over time, and (2) risk level changes over time.

(1) Significant risk changes. To measure the frequency of significant changes in unsystematic risk between the securities of firms receiving either uncertainty or consistency qualifications and firms receiving unqualified audit opinions, the following hypotheses are formulated.

H_{UC1}: Frequency of significant changes in unsystematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{UC2}: Frequency of significant changes in unsystematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{UU1}: Frequency of significant changes in unsystematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

H_{UU2}: Frequency of significant changes in unsystematic risk over the time period M_0 to M_{36} does not significantly differ

between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

(2) Risk level changes. Corresponding to the examination of systematic risk, hypotheses are developed for measuring the frequency of increases and decreases for unsystematic risk over the appropriate time periods.

H_{UC3}: Frequency of increases and decreases in unsystematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{UC4}: Frequency of increases and decreases in unsystematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{UU3}: Frequency of increases and decreases in unsystematic risk over the time period M_{-36} to M_0 does not significantly differ between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

H_{UU4}: Frequency of increases and decreases in unsystematic risk over the time period M_0 to M_{36} does not significantly differ between securities of firms receiving uncertainty

qualifications and securities of firms receiving unqualified audit opinions.

Thus, sixteen hypotheses are developed to test the impact of the issuance of selected audit opinions on the capital market risk components over two three-year time spans.

Data Analyses

Based upon the relevant constraints and specifications set forth in the preceding chapter, data were collected for this research effort. To test the hypotheses previously developed, analyses of the data are performed including the application of relevant statistical procedures.

Systematic risk.

(1) Presentation of the data. Beta coefficients and the related standards errors of the estimate (σ_b) are computed for each firm for each of the 73 examination months using 37 time-series observations of security and market returns centered around the appropriate examination month. To measure the frequency of increases and decreases and significant changes,[1] two three-year intervals are selected: M_{-36} to M_0 and M_0 to M_{36}. Beta coefficients and standard errors of the estimate for each firm are shown in Tables B-5 through B-8 in Appendix B for Samples 1 through 4, respectively. The data from these tables are used

[1] Significant changes are determined at an alpha level of 0.05, using the test for parallel lines (see Brownlee (31), pp. 354-357).

to form eight, 2 x 2 matrices that provide a basis for testing the systematic risk hypotheses. Matrices 1 through 8 and the related hypotheses are shown in Figures IV-2 and IV-3.

(2) Analyses. To determine if the samples in each matrix differed with respect to the defined systematic risk change, a chi-square (X^2) analysis is performed.[2] The chi-square test, a non-parametric procedure, indicates whether significant differences exist between groups and, consequently, is an appropriate statistically procedure for testing the systematic risk hypotheses.

To reject each null hypothesis and accept the alternate hypothesis with an alpha level of 0.05, the chi-square value for the appropriate matrix must be greater than 3.841.[3] As this was not the case with any of the matrices, the eight hypotheses could not be rejected. Based on the data of this study and the statistical procedures employed, neither the frequency of risk level changes nor the frequency of significant risk changes in systematic risk are more prevalent for firms that received

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[2]The Chi-square values were computed for each of the eight matrices without an adjustment for continuity. When sample sizes are small, chi-square values are often adjusted for continuity (see Siegel (64), pp. 107-110). The adjustment generally reduces the chi-square statistic and thus, offers a more conservative approach when the researcher expects the null hypothesis to be rejected. However, in this research study, the null hypotheses are not expected to be rejected. The chi-square statistic unadjusted for continuity provides a larger chi-square value and consequently, offers the more conservative approach given prior intuition. The chi-square statistics both adjusted and unadjusted for continuity are presented in Table B-22 in Appendix B.

[3]For an alpha level of 0.10, the appropriate value for rejection of the null hypothesis is 2.706. For any 2 x 2 matrix, there exists one degree of freedom.

MATRIX 1
Hypothesis H_{SC1}

	Significant Change[b] in Beta by Firm over the Period M_{-36} to M_0	
	Significant	Not Significant
Consistency	8 (4/4)[a]	51
Unqualified	10 (7/3)[a]	49

$X^2 = 0.262$

MATRIX 2
Hypothesis H_{SC2}

	Significant Change[b] in Beta by Firm over the Period M_0 to M_{36}	
	Significant	Not Significant
Consistency	10 (7/3)[a]	49
Unqualified	11 (7/4)[a]	48

$X^2 = 0.058$

MATRIX 3
Hypothesis H_{SU1}

	Significant Change[b] in Beta by Firm over the Period M_{-36} to M_0	
	Significant	Not Significant
Uncertainty[d]	1 (0/1)[a]	19
Unqualified	1 (0/1)[a]	19

$X^2 = 0.000$

MATRIX 4
Hypothesis H_{SU2}

	Significant Change[b] in Beta by Firm over the Period M_0 to M_{36}	
	Significant	Not Significant
Uncertainty[d]	7 (5/2)[a,c]	13
Unqualified	7 (5/2)[a]	13

$X^2 = 0.000$

FIGURE IV-2. Matrices of significant changes in beta.

[a]Numbers within parentheses represent the breakdown of significant increases and decreases, respectively.

[b]Significant changes were determined at an alpha level of 0.05. Significant changes were also examined at alpha levels of 0.10 and 0.20. Concurring with the results at the 0.05 level, no significant differences between the samples were noted.

FIGURE IV-2. (continued)

[c]The Fisher Exact Probability Test (see Siegel (64), pp. 96-104) was applied to test the null hypothesis: H_0; Period M_{-36} to M_0 and Period M_0 to M_{36} show equal proportions of significant increases and decreases. The probability of H_0 occurring was 0.393. Thus, with an alpha level of 0.05, the null hypothesis could not be rejected.

[d]Subcategorization by opinion type is presented in Table B-17 in Appendix B.

MATRIX 5
Hypothesis H_{SC3}

	Change in Beta by firm over the period M_{-36} to M_0	
	Increase	Decrease
Consistency[a]	28	31
Unqualified	36	23

X^2 - 2.185

MATRIX 6
Hypothesis H_{SC4}

	Change in Beta by firm over the period M_0 to M_{36}	
	Increase	Decrease
Consistency[a]	27	32
Unqualified	32	27

X^2 = 0.847

MATRIX 7
Hypothesis H_{SU3}

	Change in Beta by firm over the period M_{-36} to M_0	
	Increase	Decrease
Uncertainty[a]	10	10
Unqualified	10	10

X^2 = 0.000

MATRIX 8
Hypothesis H_{SU4}

	Change in Beta by firm over the period M_0 to M_{36}	
	Increase	Decrease
Uncertainty[a]	11	9
Unqualified	12	8

X^2 = 0.102

FIGURE IV-3. Matrices of risk level changes--beta.

[a]Subcategorization by opinion type is presented in Table B-18 in Appendix B.

either uncertainty or consistency qualifications than for firms that received unqualified opinions.

Unsystematic risk.

(1) Presentation of the data. The ordinary least squares procedure used in the computation of beta coefficients provides the appropriate data for the measurement of unsystematic risk. Unsystematic risk for each of the three months, M_{-36}, M_0, and M_{36}, is shown in Tables B-9 through B-12, in Appendix B for the firms in the samples. To test the unsystematic risk hypotheses, the data from Tables B-9 through B-12 are used to form Matrices 9 through 16 as shown in Figures IV-4 and IV-5.

(2) Analyses. Corresponding to the analyses of systematic risk, the non-parametric chi-square test is applied to the data to determine whether significant differences exist between the samples with respect to the defined unsystematic risk change.[4] Rejection of each of the eight unsystematic risk hypotheses at an alpha level of 0.05 requires the chi-square statistic to be greater than 3.841. As each chi-square statistic is less than 3.841, the eight hypotheses are not rejected. Consequently, the results obtained in this study indicate that frequency of risk level changes and the frequency of significant risk changes in unsystematic

[4]As with the examination of systematic risk, chi-square values for the unsystematic risk matrices are computed without an adjustment for continuity. For a discussion of the appropriate reason for this procedure, see page 69, footnote 2.

MATRIX 9
Hypothesis H_{UC1}

	Significant Change[a] in Unsystematic Risk by Firm over the Period M_{-36} to M_0	
	Significant	Not Significant
Consistency[c]	2 (0/2)[b]	57
Unqualified	2 (1/1)[b]	57

$X^2 = 0.000$

MATRIX 10
Hypothesis H_{UC2}

	Significant Change[a] in Unsystematic Risk by Firm over the Period M_0 to M_{36}	
	Significant	Not Significant
Consistency[c]	4 (0/4)[b]	55
Unqualified	5 (0/5)[b]	54

$X^2 = 0.000$

MATRIX 11
Hypothesis H_{UU1}

	Significant Change[a] in Unsystematic Risk by Firm over the Period M_{-36} to M_0	
	Significant	Not Significant
Uncertainty[c]	1 (0/1)[b]	19
Unqualified	1 (1/0)[b]	19

$X^2 = 0.000$

MATRIX 12
Hypothesis H_{UU2}

	Significant Change[a] in Unsystematic Risk by Firm over the Period M_0 to M_{36}	
	Significant	Not Significant
Uncertainty[c]	1 (0/1)[b]	19
Unqualified	0 (0/0)[b]	19

$X^2 = 0.003$

FIGURE IV-4. Matrices of significant changes in unsystematic risk.

[a]Significant changes were determined at an alpha level of 0.05, using the test for parallel lines (see Brownlee (31), pp. 354-357). Significant changes were also examined at an alpha level of 0.10 and 0.20. Concurring with the results at the 0.05 level, no significant differences between the samples were noted.

[b]Numbers within parentheses represent the breakdown of significant increases and decreases, respectively.

[c]Subcategorization by opinion type is presented in Table B-19 in Appendix B.

MATRIX 13
Hypothesis H_{UC3}

	Change in Unsystematic Risk by Firm over the Period M_{-36} to M_0	
	Increase	Decrease
Consistency[a]	39	20
Unqualified	36	23

$X^2 = 0.329$

MATRIX 14
Hypothesis H_{UC4}

	Change in Unsystematic Risk by Firm over the Period M_0 to M_{36}	
	Increase	Decrease
Consistency[a]	34	25
Unqualified	32	27

$X^2 = 0.138$

MATRIX 15
Hypothesis H_{UU3}

	Change in Unsystematic Risk by Firm over the Period M_{-36} to M_0	
	Increase	Decrease
Uncertainty[a]	11	9
Unqualified	9	11

$X^2 = 0.400$

MATRIX 16
Hypothesis H_{UU4}

	Change in Unsystematic Risk by Firm over the Period M_0 to M_{36}	
	Increase	Decrease
Uncertainty[a]	10	10
Unqualified	11	9

$X^2 = 0.100$

FIGURE IV-5. Matrices of risk level changes--unsystematic risks.

[a]Subcategorization by opinion type is presented in Table B-20 in Appendix B.

risk does not significantly differ between firms that receive either uncertainty or consistency qualifications and other firms.

B. HYPOTHESES AND DATA FOR CROSS-SECTIONAL ANALYSES

The preceding analyses disclosed that neither consistency nor uncertainty qualifications had a significant impact on the capital market risk components. An important related aspect not examined in the preceding analyses involves differences in the levels of unsystematic risk between samples over time.[5] Regrouping of the data provides a basis for disclosing any significant differences between the samples. To test this expectation, two hypotheses are formally stated. Data are also presented along with the appropriate statistical tests.

Formal Statement of Hypotheses

Securities of firms receiving uncertainty qualifications are expected to have greater levels of unsystematic risk than securities of firms that received unqualified opinions. No differences in unsystematic risk levels, however, are expected between securities of firms receiving consistency qualifications and securities of firms receiving unqualified

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[5]Preliminary examination of differences in levels of systematic risk between samples across time was inconclusive. Levels of systematic risk were significantly greater (at an alpha level of 0.10) for firms receiving uncertainty qualifications than its related control sample for 1 of the 73 periods. Levels of systematic risk were significantly greater (at an alpha level of 0.10) for firms receiving consistency qualification than its related control sample for 26 of the 73 periods. These significant differences occurred during the first portion of the 73-month time span. During this period, beta coefficients for the control sample were low (many firms were below the market average of 1.00) but steadily increased.

audit opinions. Based on these expectations as developed in Chapter III, the following hypotheses are formulated:

H_{UC5}: Levels of unsystematic risk are not significantly different between securities of firms receiving consistency qualifications and securities of firms receiving unqualified audit opinions.

H_{UU5}: Levels of unsystematic risk are not significantly different between securities of firms receiving uncertainty qualifications and securities of firms receiving unqualified audit opinions.

Data Analyses

Presentation of the data. To test these hypotheses, unsystematic risk as measured by the variance of the residuals is computed for each firm for each of the 73 time periods. In addition, the average level of unsystematic risk for each sample is computed as:

$$\overline{Var}\ (u_t) = \frac{1}{n} \sum_{i=1}^{n} \sigma^2_{u_{it}} \qquad \text{(IV-1)}$$

where $\overline{Var}\ (u_t)$ is the average level of unsystematic risk for period t and $\sigma^2_{u_{it}}$ is the variance of the residuals for firm i in period t. Average unsystematic risk for each sample during the time period of the analysis is given in Table B-23 in Appendix B and plotted against time in Figure IV-6 and Figure IV-7.

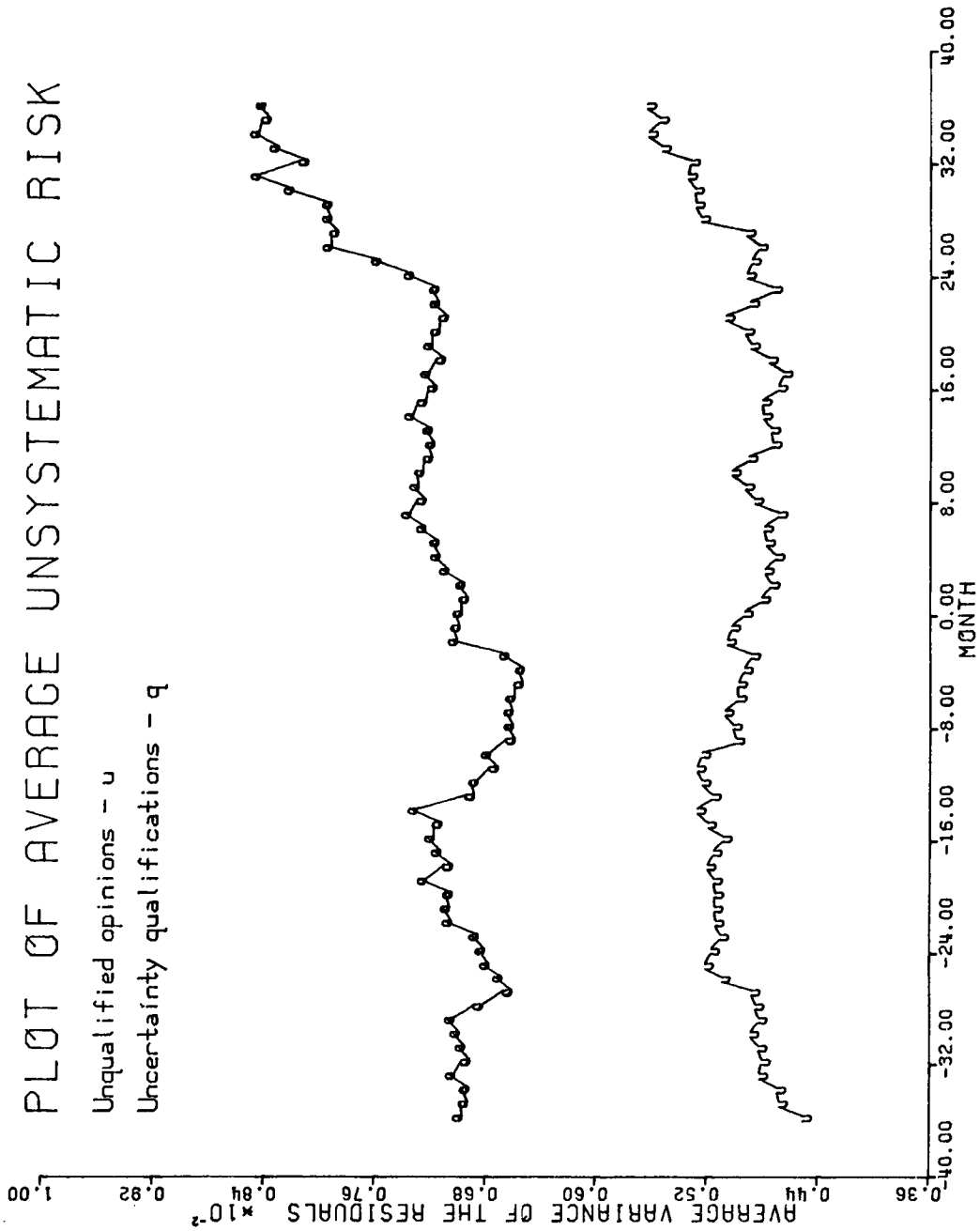


FIGURE IV-6. Plot of average unsystematic risk--consistency qualifications.

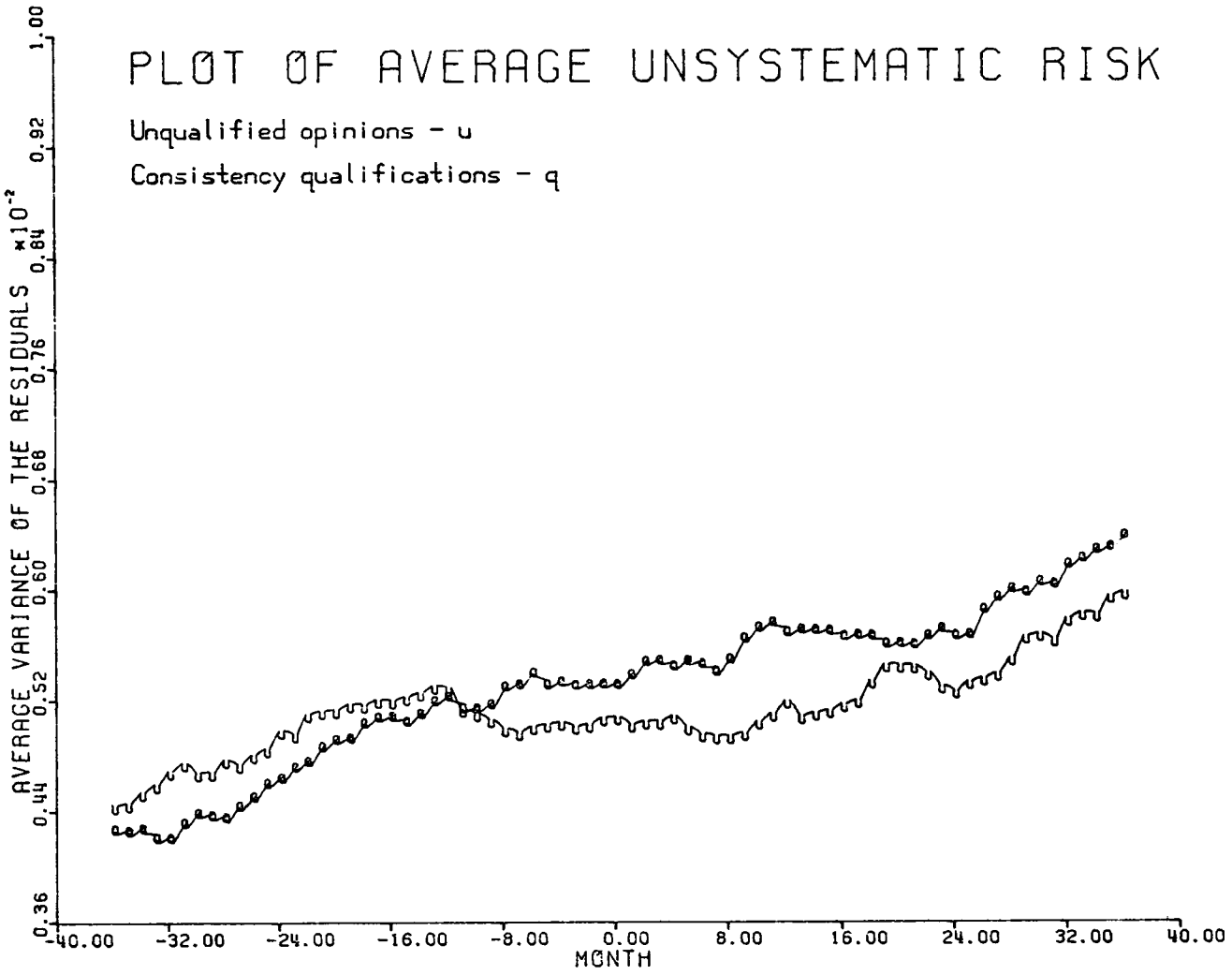


FIGURE IV-7. Plot of average unsystematic risk--uncertainty qualifications.

Analyses. To determine whether firms that received either uncertainty or consistency qualifications exhibited greater levels of unsystematic risk, the Mann-Whitney u test, a non-parametric test, is utilized. The u statistics shown in Table B-24 in Appendix B are computed for each period comparing Sample 1 to Sample 3 to test Hypothesis H_{UC5}. U statistics to test Hypothesis H_{UU5} shown in Table B-25 in Appendix B are derived from comparing Sample 2 to Sample 4 for each period.

Examination of the u statistics for the comparison of Sample 1 and Sample 3 reveals little significant difference in unsystematic risk levels between securities of firms that received consistency qualifications and securities of firms that received unqualified audit opinions. For Sample 1 and Sample 3, the u statistic is significant at the 0.10 level (one-tailed test) for only 2 of the 73 periods tested. Thus, the null hypothesis H_{UC5} is not rejected.

For 68 of the 73 periods tested for the comparison of Sample 2 to Sample 4, however, the u statistic is significant at the 0.10 level (one-tailed test). The remaining 5 periods' statistics are significant at an alpha level of 0.20. These statistics provide rather conclusive evidence to reject the null hypothesis H_{UU5} and accept its alternative hypothesis. Thus, based on the data and the statistical tests employed, it appears that securities of firms that received uncertainty qualifications exhibited significantly greater unsystematic risk levels than securities of firms that received unqualified audit opinions.

C. SUMMARY

Sixteen hypotheses are formally stated and tested to measure the informational impact of uncertainty and consistency qualifications as evidenced by frequency of significant risk changes and frequency of risk level changes for risk components. Data relating the unsystematic and systematic risk components for the experimental and control samples over the two time periods, M_{-36} to M_0 and M_0 and M_{36}, are collected to examine these time-series hypotheses.

Two additional hypotheses are developed to determine whether the securities of firms receiving selected opinion qualifications are characterized as securities with greater levels of unsystematic risk. Hypotheses related to these cross-sectional analyses are tested in a comparative analysis of relative unsystematic risk levels over a 73-month period.

For both the time-series and cross-sectional analyses, appropriate statistical procedures are applied to test the data. Chi-square analyses are performed for data related to the 16 time-series hypotheses while the Mann-Whitney u test is performed for data related to the cross-sectional hypotheses.

Analyses of the data indicate that the 16 null hypotheses regarding the time-series analyses could not be rejected. Thus, the evidence indicates that the issuance of either uncertainty or consistency qualifications has little impact on the market risk components. For the cross-sectional analyses, the hypothesis for the examination of uncertainty qualifications was rejected but the hypothesis regarding

consistency qualifications could not be rejected. Consequently, it was concluded that the securities of firms receiving uncertainty qualifications exhibited significantly larger levels of unsystematic risk than the related control sample while no significant difference was noted between the securities of firms receiving consistency qualifications and its related control sample. Further development of these conclusions and related accounting implications are presented in Chapter V.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Recognizing risk as an important valuation factor, this study examines informational aspects of uncertainty and consistency qualifications as evidenced by their impact on the capital market risk components. In Chapter IV the data from the study and results of the statistical tests were presented. In this chapter, detailed discussions of conclusions and related implications based upon the preceding chapter's results are presented. Limitations of the study and research extensions are also considered.

A. RESEARCH CONCLUSIONS

Since this research effort includes time-series and cross-sectional data analyses, research conclusions and related accounting implications are grouped and presented in that order.

The Impact of Qualified Audit Opinions on Capital Market Risk Components

Measurement of the impact of selected audit opinions on the market risk components was approached through time-series analyses. Related data and statistical tests presented in the preceding chapter underlie the basis for the research conclusions regarding consistency and uncertainty qualifications.

Consistency qualifications.

(1) Results. Data analyses and statistical tests presented in Chapter IV indicate that the eight null, time-series, hypotheses regarding consistency qualifications are not rejected. Thus, behavior of the systematic and unsystematic risk components does not significantly differ between securities of firms changing accounting principles and securities of firms receiving unqualified audit opinions.

(2) Implications. Indicating that the consistency qualification has little informational impact to investors, these results provide additional evidence of market efficiency. Most changes in accounting principles are illusory and result only in changes in accounting numbers; i.e., the economic income of the firm is unchanged. Accordingly, in an efficient market context such changes are recognized as illusory and no change in the risk assessment of the security occurs. This expectation is supported by the findings. As indicated in Chapter II, examinations by other researchers of the communicative aspects of consistency qualifications and market efficiency have been based on unexpected returns rather than risk. The results of this study concur with those of earlier studies while providing an alternative methodological approach. Further, the examination of the effect of changing accounting principles on beta over time responds to issues raised by Scott (61) and others in the accounting literature.

Uncertainty qualifications.

(1) Results. Application of statistical tests in Chapter IV to the time-series data regarding uncertainty qualifications indicated that the eight null hypotheses could not be rejected. Consequently, it was concluded that the issuance of an uncertainty qualification by the independent accountant had little impact on security risk levels.

(2) Implications. This finding indicates that the market has previously recognized the impact of the uncertainty on risk and accordingly, has reflected the assessment in the price of the security. In the environment of an efficient market, the price of the security fully reflects the appropriate underlying risk characteristics of the security. Unless the uncertainty qualification provides new information on the risk assessment, no changes in risk levels should be expected.

Many accountants may find this result surprising since it is often believed that an uncertainty qualification communicates a lesser degree of credibility regarding the firm's financial statements and more uncertainty regarding the firm's future accounting income and returns. Although it is often inferred that an uncertainty qualification indicates a change in the risk characteristics of the firm and its securities to investors, the data from this study do not support that view.

In most cases, uncertainty qualifications result from the occurrence or possible occurrence of an uncertainty event that indicates a lesser degree of credibility for specific aspects regarding the firm's financial statements. However, the market generally has recognized the

impact of the possible occurrence of the uncertainty event prior to the issuance of the qualification. Consequently, the opinion provides little new information regarding the degree of credibility of a firm's financial statements.

Since the impact of the uncertainty qualification on market risk is apparently insignificant, then questions arise regarding the economic benefits derived from the expression of this type of opinion. Thus, the results of this study suggest that a further examination of informational content of uncertainty qualifications respond to issues raised by the findings of this study.

Cross-Sectional Analyses of Unsystematic Risk

In addition to the performance of time-series analyses for the market risk components, Chapter IV also presented the cross-sectional analyses of unsystematic risk. The following conclusions and implications are drawn from these cross-sectional analyses of the data.

Results. After applying statistical tests to the data, it was concluded that firms receiving uncertainty qualifications exhibited significantly greater levels of unsystematic risk than those firms receiving unqualified opinions across time. No significant differences, however, were noted in unsystematic risk levels between securities of firms receiving consistency qualifications and the related control sample.

Implications.

(1) Consistency qualifications. Results from the analyses of consistency qualifications indicate that variability of security returns does not significantly differ between firms changing accounting principles and other firms. Consequently, the evidence from this research corroborates evidence from prior studies by indicating that most changes in accounting principles are illusory and thus, do not affect the risk assessments of the market.

(2) Uncertainty qualifications. The results for the examination of uncertainty qualifications, however, did indicate that the security returns of these firms have a greater degree of variability that cannot be explained by the market factor. Examination of the nature of the typical event that necessitates an uncertainty qualification explains this behavior pattern. The characteristics of the uncertainty indicate that relatively large adjustments to the security's price by investors would occur due to changes in perception regarding future security returns. Continued greater levels of unsystematic risk, therefore, would be expected for these firms. Thus, although uncertainty qualifications have little impact on the risk components, the securities of firms receiving such qualifications exhibit continued higher levels of unsystematic risk across time.

B. LIMITATIONS

An interpretation of the results of the research effort should appropriately consider the several methodological and data access

limitations that were necessarily incorporated in the study.

Time-Series Data

Two methodological limitations result from the employment of time-series data in the least-squares regression estimation of systematic and unsystematic risk. The first limitation relates to the equal weights given time-series observations in the regression analyses. The second limitation arises from the utilization of time-series data which assume stability of firm characteristics over the time period that the regression procedure is employed.

Equal weights to observations. The regression procedure of giving equal weights to each time-series observation seriously dilutes by the averaging process any dramatic short-run effects of risk changes. The procedure, however, does indicate trends over time. In that regard, the econometric model developed by Sunder (67) offers some promise. Although based on time-series data, this model varies the weights assigned to the time-series observations during the period in which these observations are utilized.

Stability of firm characteristics. In addition to the assignment of equal weights to the observations, the use of time-series data provides another potential source of bias. If firm characteristics do not remain stable over the period of the regression analysis, then possible measurement error could result from the use of time-series data. In this study, 37 months was selected as an appropriate time period for the analysis as a means of reducing this potential source of

bias. The concern for stability in firm characteristics over the time period of the regression analysis must be tempered by the need to have an appropriate number of observations in the regression analysis. The 37-month period was selected to balance concern for both objectives. Any significant changes, however, in the characteristics of firms examined in this study over the 37-month periods would impair an inherent assumption of the study.

Sample Size

Along with the limitations imposed by the use of time-series data, another methodological constraint resulted from the number of firms in Sample 2 (uncertainty qualifications). Comprising twenty firms, the small sample size partially results from the limited number of uncertainty qualifications issued each year. The additions to the population of firms receiving uncertainty qualifications, however, is less than this number since many of these qualifications are for firms that had received uncertainty qualifications in several prior years. Thus, samples of firms receiving this type of qualification are necessarily limited. The twenty firms included in the present research analyses, however, are adequate to draw statistical inferences and reach conclusions.

Market Characteristics of Firms Examined

Results of this study cannot be applied to small, privately-held companies. Firms examined in the study are large, publicly-held companies that are required to have a report by the independent accountant accompany the annual financial statements. Although capital

markets for the firms examined in this study exhibit a high degree of efficiency, the accounting profession also has responsibilities to users for fair presentation of financial statements of companies that are not large and publicly held. The capital market for these firms may not possess this relatively high degree of efficiency. An evaluation of uncertainty qualifications based on the results of this research inquiry should be tempered by an awareness of the efficiency of the capital market examined.

C. IMPLICATIONS FOR FUTURE RESEARCH

As with most research inquiries, this study has identified other areas for possible future research. In addition to parallel studies avoiding the limitations of the present research endeavor, areas for future research include analyses that offer alternative approaches for the examination of the problem addressed in the study.

Measurement of Systematic Risk Using Alternative Models

Limitations inherent in the use of time-series data indicate that an examination of systematic risk based on an alternative computation of the beta coefficient as proposed by Sunder (67) could provide additional insights into the behavior of systematic risk. A study of this type could mark a significant contribution to the literature and provide additional clarification of the results obtained in this study.

Examination of Firms that Frequently Change Accounting Principles

For the examination of firms changing accounting principles, the sample was restricted to those firms that had changed accounting

principles in a specific year but had received only unqualified opinions for the three-year periods prior and subsequent to the change in accounting technique. As a consequence, firms that engaged in frequent changes of accounting principles were excluded from this study. These firms may very well exhibit different risk characteristics than those firms that changed accounting principles only once. Specifically, although representing illusory changes in accounting income, frequent changes in accounting technique may provide information by signaling the market of other firm characteristics. This interesting issue was not addressed in this research.

Residual Analysis for Firms Receiving Uncertainty Qualifications

This research inquiry examines the impact of rendering uncertainty qualifications on the capital market risk components. A study of the informational content of uncertainty qualifications based upon an examination of unexpected returns or residuals could provide additional insights and evidence for a reasoned assessment of the effect of the audit opinion qualification. An examination of unexpected returns during the periods in which (1) the announcement is made regarding the uncertainty, (2) the rendering of the audit opinion qualified for uncertainty, and (3) resolution of the uncertainty occurs could be a useful approach. Several research efforts noted in Chapter II studied the informational content based upon unexpected returns for consistency qualifications. A related study of uncertainty qualifications could make a significant contribution to accounting literature.

Laboratory Study of Users' Reactions to Uncertainty Qualifications

By examining securities' prices, this study has aggregated the varying reactions of individual investors. Although such an approach is both useful and appropriate, an investigation of individual users' responses to uncertainty qualifications could benefit the accounting profession. A study of aggregate market behavior towards audit opinions may differ significantly from a study of individual creditors and investors responses to audit opinions. Consequently, a laboratory study of individual users' reactions to audit qualifications could provide additional and worthwhile insights for a carefully reasoned evaluation of qualified audit opinions.

D. SUMMARY

This chapter presents the conclusions drawn from the examination of the results of the research analyses presented in Chapter IV. Conclusions and implications are drawn from the time-series and cross-sectional analyses for the examination of securities receiving consistency and uncertainty qualifications.

Through the time-series examination of consistency qualifications, this study provides additional evidence that this type of qualification has little informational content and that the market is relatively efficient. These conclusions are supported by an examination of risk components as contrasted to earlier studies based upon analyses of returns.

Examination of firms that had received uncertainty qualifications indicated that these qualifications had little impact on the capital

market risk components and thus, had little informational content to investors. These results raise questions regarding the role and purpose of the uncertainty qualification and indicate that additional research in the area may prove worthwhile.

Cross-sectional analyses of unsystematic risk indicate that security returns of firms receiving uncertainty qualifications exhibited a consistently larger level of unsystematic risk and thus, a greater degree of variability in returns than the securities of other firms. This behavior results from frequent adjustments to the security's price by the market based on changes in perceptions regarding future security returns.

As with most empirical studies, certain limitations exist in regard to the study. The employment of time-series data in the regression procedure represents a primary limitation of the study. Not only does this procedure assign equal weights to the time-series observations, but it also assumes that firm characteristics remain stable over the time period of the analysis. Other limitations result from the small sample size of firms receiving uncertainty qualifications and the special market characteristics of firms examined.

Possible areas for future research have been identified by the study. Utilization of models that make adjustments for problems in time-series data represent one potential research extension. Other areas for future research include an examination of firms that frequently change accounting principles, residual analyses of firms receiving uncertainty qualifications, and a laboratory study of users' reactions

to uncertainty qualifications. The results of this study indicate that further investigation of the concepts examined in the present analyses would prove not only interesting but also beneficial to both the users of financial statements and accountants.

CHAPTER VI

SUMMARY

Attestation regarding the degree to which a firm's financial statements are fairly presented is among the most basic services provided by the public accounting profession. The profession has historically recognized that one important aspect of this attest function is its communicative effectiveness.

In financial theory, the salient items in the valuation of any asset are the asset's risk and return characteristics. As noted by accounting standard-setting groups and financial theorists, only those items that apprise investors about risk and return are of relevant informational value. Consequently, if attestation represents a communication process then the function should convey information regarding risk and returns.

With the advent of portfolio theory, the concept of systematic and unsystematic risk has been developed to measure security risk characteristics. Representing the covariability of security returns to the market return, systematic risk is non-diversifiable. Unsystematic risk is computed by the variance of the residuals and indicates risk that can be eliminated through diversification.

A. OBJECTIVE OF THE STUDY

The objective of this study was to examine informational aspects of uncertainty and consistency audit opinion qualifications, as evidenced by their impact on the capital market risk components, a widely recognized financial concept.

Consistency Qualifications

Prior empirical research has attempted to measure the informational content of consistency qualifications based on the impact on returns. Finding that the consistency qualification has little impact on market-determined returns, several researchers have indicated that an inquiry into the impact of the qualification on risk could be worthwhile. Responding to this issue, this study offers an alternative technique based on risk for the measurement of informational aspects of consistency qualifications.

Uncertainty Qualifications

Representing an initial effort to measure the informational aspects of uncertainty qualifications based on market-determined data, this study includes an examination of the impact of uncertainty qualifications on capital market risk levels. If uncertainty qualifications indicate a lesser degree of credibility and more uncertainty regarding future returns, then a change in capital market risk levels would be expected.

B. METHODOLOGY

The Model

To measure the impact of audit opinions on the risk components the market model was utilized for the computation of systematic and unsystematic risk. To examine these risk components, the market model was employed for each sample firm for each of the 73 months surrounding the month of the appropriate audit report. For each of the 73 firm regression lines, 37 time-series observations centered around the month under examination were used. Thus, risk levels for each firm were known for each of the 36 months prior to the audit report, the month of the audit report, and the 36 months subsequent to the audit report.

Samples

Samples were selected from the 1968-1971 editions of ATT applying certain general and opinion pattern criteria. Samples of firms receiving consistency qualifications, firms receiving uncertainty qualifications, and control samples of firms receiving only unqualified audit opinions were formed.

Time-Frame

To examine the impact of qualifications of the securities, changes in risk component were measured for two time spans comparing three months, M_{-36} to M_0 and M_0 to M_{36}, where the subscripts represent the month relative to the issuance of the appropriate audit report. Changes were measured in two ways: (1) the frequency of significant risk changes, and (2) the frequency of risk level changes, regardless of magnitude.

Hypotheses

As uncertainty and consistency qualifications were not expected to convey information to investors regarding risk, it was hypothesized that there would be no significant differences between the experimental and control samples regarding the defined changes in the risk components for the time spans examined. In addition to the time-series hypotheses that form the basis of the study, cross-sectional hypotheses were also formulated. For firms receiving uncertainty qualifications, security returns were expected to exhibit a greater degree of variability across time as a result of continued uncertainty and relatively large changes in investor perception regarding future returns. Although changes in unsystematic risk were not expected to differ significantly, levels of unsystematic risk across time were expected to be larger for firms receiving uncertainty qualifications.

C. ANALYSES AND IMPLICATIONS

Analyses

For the measurement of the time-series changes in systematic and unsystematic risk, chi-square tests were applied. The expectations that no significant differences in changes of the risk components over time existed among the samples were supported by the analyses.

Testing of the cross-sectional hypotheses required the application of the Mann-Whitney u test. Results indicated that firms receiving uncertainty qualifications consistently exhibited significantly greater levels of unsystematic risk than those firms that received only unqualified audit opinions. No significant differences

were noted between firms receiving consistency qualifications and the related control sample.

Implications

Consistency qualifications. Indicating that the consistency qualification had little effect on risk levels the results support the conclusion that the consistency qualification has little informational impact and that the market is relatively efficient. The results are based on an examination of risk components as contrasted to earlier studies that supported market efficiency based on analyses of returns.

Uncertainty qualifications. The examination of firms that had received uncertainty qualifications indicated that the time-series behavior of the risk characteristics of these firms did not significantly differ from other firms. It was concluded, therefore, that uncertainty qualifications have little effect on the capital market risk components and thus, have little informational content. Cross-sectional analyses of unsystematic risk demonstrated that security returns of firms receiving uncertainty qualifications exhibited a consistently larger level of unsystematic risk than other firms. This behavior results from relatively large adjustments to the security's price by the market as a result of changes in perceptions regarding future security returns.

D. LIMITATIONS AND EXTENSIONS

Certain limitations and research extensions also existed in regard to the study.

Time-Series Data

A primary limitation resulted from the use of time-series data in the regression analyses. This procedure gave equal weights to all observations and assumed stability of firm characteristics over time. Researchers have recently developed other techniques for the examination of systematic risk that do not assign equal weights to all observations. The use of these techniques offers a potential improvement over this research and represents a logical extension of the present analysis.

Characteristics of Firms Examined

The results of this study cannot be extended to small, privately-held companies since this research examined only large, publicly-held companies. For smaller firms, the impact of audit opinion qualifications may significantly differ. An examination of individual users' responses to audit opinions may provide evidence regarding the impact of the opinion for smaller companies and thus, provide insights for a reasoned evaluation of audit qualifications.

Examination of Residuals

While other researchers have examined the impact of consistency qualifications on returns, this study examines the impact of consistency and uncertainty qualifications on market-determined risk measures. An examination of the informational content of uncertainty qualifications based on unexpected returns could make a significant contribution to the accounting literature.

Others

Another methodological constraint resulted from the small sample size of firms receiving uncertainty qualifications. Although the number of firms was adequate to draw statistical inferences and reach conclusions, a larger sample might provide additional weight to the results of this research. The examination of consistency qualifications was restricted to firms receiving unqualified audit opinions the three years prior and subsequent to the consistency qualification. Frequent changes of accounting principles by firms, however, may provide certain signals to the market. An examination of these firms, although excluded from this research, may prove worthwhile.

E. SUMMARY

Recognizing risk as an important valuation factor, this study included an examination of informational aspects of uncertainty and consistency qualifications as evidenced by their impact on the capital market risk components. The results indicate that these types of opinions are of only marginal informational value to investors.

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APPENDICES

APPENDIX A

THE EFFICIENT MARKET HYPOTHESIS AS A FINANCIAL CONCEPT

The Three Forms of the Efficient Market Hypothesis

For security markets, certain expectations regarding market behavior are referred to as the efficient market hypothesis. Three versions of the efficient market hypothesis have been formulated and tested: the weak form, the semi-strong form, and the strong form. The three forms differ with respect to what degree market prices are assumed to reflect information.

Weak Form

The first version of the hypothesis to be suggested and tested was the weak form, sometimes referred to as the random walk hypothesis. This form holds that current security prices fully reflect the information implied by the historical sequence of security prices. This approach implies that successive price changes are independent and is expressed mathematically as:

$$Pr(P_{jt+1}|X) = Pr(P_{jt+1}) \qquad (A\text{-}1)$$

where P_{jt+1} is the price of security j at period (t+1) and X is the information set containing the sequence of past security prices. If successive price changes are not independent then it would be possible to formulate an investment strategy based on the behavior of past

security prices (e.g., "charting") that would provide an expected return above the equilibrium return for the various portfolios. Numerous studies of the random walk hypothesis have been conducted and the findings strongly support the weak form of the efficient market hypothesis.[1]

Strong Form

At the other end of the continuum is the strong form of the efficient market hypothesis. This form holds that the prices of securities reflect not only the information that is generally known through public announcements but also information that is not publically available. Thus, under the strong form all information is fully reflected in the current equilibrium value of a security and, as a consequence, no trading strategy may be devised that would yield abnormal returns.

Empirical tests of the strong form have consisted of evaluations and analyses of the performance of portfolios managed by those groups which might have access to inside information. Although results of these studies have generally supported the strong form of the hypothesis, there has also been some evidence as to market inefficiencies.[2] Consequently,

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[1]See, for example, Arnold B. Moore, "Some Characteristics of Changes in Common Stock Prices" in Paul H. Cootner, The Random Character of Stock Prices (Cambridge, Mass.: The MIT Press, 1964), pp. 139-161; Eugene F. Fama, "The Behavior of Stock Prices," Journal of Business, XXXVIII (January, 1965), pp. 34-105; Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work." Journal of Finance, May, 1970, pp. 383-417.

[2]Dyckman, Downes, and Magee (27) cite several studies that indicate some evidence of market inefficiencies.

there is some degree of uncertainty regarding the validity of the strong form of the hypothesis.

Semi-Strong Form

The intermediate version of the efficient market hypothesis is referred to as the semi-strong form and is the relevant form in this study. Advocates of this form assert that all publically available information is reflected in security prices. The semi-strong form, thus, provides that since annual financial statements and the audit report are widely distributed to stockholders, any new information contained in these reports would be reflected in the price of the security.

The first empirical study of the semi-strong form of the efficient market hypothesis was conducted by Fama, Fisher, Jensen, and Roll (FFJR) who investigated the informational content of stock split announcements (32). FFJR hypothesized that stock splits, which are usually accompanied by dividend increases, conveyed information about a higher level of dividends and an increase in the earnings of the firm that would be required to sustain the higher level of dividend payments. The sample for the study was defined as all of those stock splits of 25 percent or more on the New York Stock Exchange during the period 1927-1959. Employing the market model in the study, FFJR regressed the natural logarithm of the monthly returns of a security against an index of monthly market returns. By removing the impact of general market conditions the residuals from this regression equation were then indicative of only the informational effects pertaining to the security.

A cross-sectional average was taken for the residuals of those securities that had been split and a cumulative term (CAR) was calculated for the periods of 29 months before and after the date of the split. The CAR consistently increased up to the date of the announcement of the stock split. After the split, however, the cumulative term leveled off indicating a normal relationship between rates of return on these stocks and the return on the market as a whole. This behavior pattern led FFJR to conclude that:

> . . . on the average, the market has correctly evaluated the implications of a split for future divident behavior and that these evaluations are fully incorporated in the price of the stock by the time the split occurs. (32:20)

They further concluded that:

> Thus, the results of the study lend considerable support to the conclusion that the stock market is "efficient" in the sense that stock prices adjust very rapidly to new information. (32:20)

Using a methodology similar to that of the FFJR study, Beaver examined the effect of accounting earnings on the behavior of the market as reflected both in returns and volume activity (13). Recognizing that corporate management releases the annual earnings figure to the financial press before the mailing of annual reports, Beaver used the annual earnings announcement as the relevant stimulus for the expectation of market reaction.

Beaver examined both the size of price changes through the use of the market model and the levels of trading volume surrounding the earnings announcement. He found that the absolute values of the price changes and the volume of trading were significantly higher during the earnings announcement week. Further, price changes and volume in the

week following the announcement week returned to preannouncement levels. Based upon these results, Beaver concluded that the market reacts quickly and efficiently to the new information contained in the annual earnings announcement.

There have been numerous other studies that have also attempted to measure whether the market does indeed act quickly and without bias to new information.[3] These studies have generally supported the semi-strong form of the efficient market hypothesis. Thus, the literature contains numerous studies that provide strong evidence to support both the weak and semi-strong forms of the efficient market hypothesis. However, evidence regarding the strong form has been inconclusive and, as a consequence, its validity has been questioned.[4]

The Market Model

The market model has been developed to measure the risk and return characteristics of securities in the context of an efficient capital market.[5] An ordinary least squares time-series linear regression of security returns against a market return is utilized in the market model. As a consequence, the model isolates market reaction to firm-specific data from general market movements. In terms of the model:

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[3]For example, Ball (8), Ball and Brown (10), Gonedes (40), and Kaplan and Roll (48).

[4]For an excellent discussion of studies of the strong form of the efficient market hypothesis, see Dyckman, Downes, and Magee (27), Chapter II.

[5]The market model was first proposed by Markowitz (55) and later extended by Sharpe (62).

$$E(R_{it}) = a_i + B_i E(R_{mt}) \quad \text{(A-2)}$$

$$R_{it} = a_i + B_i R_{mt} + u_{it} \quad \text{(A-3)}$$

$$E(u_{it}) = 0 \quad \text{(A-4)}$$

where

R_{it} = the return of security i in period t

a_i = the regression intercept term

B_i = the slope of the regression line giving the linear relationship between R_{it} and R_{mt}

E = notation of expected value

R_{mt} = the market return in period t

u_{it} = stochastic portion of the individualistic component of R_{it} or disturbance term.

The Components of Market Risk

The Development of the Risk Components

Total risk associated with security i is defined as the variability of its returns. The variance of returns (σ_i^2) is represented statistically by:

$$\sigma_i^2 = [R_{it} - E(R_{it})]^2 \quad \text{(A-5)}$$

Substituting Equations (A-3) and (A-2) yields:

$$\sigma_i^2 = [(a_i + B_i R_{mt} + u_{it}) - (a_i + B_i E(R_{mt})]^2 \quad \text{(A-6)}$$

Reducing this equation, the variance becomes:

$$\sigma_i^2 = [B_i E(R_{mt}) - B_i R_{mt} + u_{it}]^2 \qquad \text{(A-7)}$$

Since by definition $E(u_{it}) = 0$ (Equation (A-4), Equation (A-7) may be rearranged so that:

$$\sigma_i^2 = B_i^2 \ \sigma_m^2 + Var(u_{it}) \ . \qquad \text{(A-8)}$$

Equation (A-8) holds that the variance of a security is composed of two parts: a systematic risk component, $B_i^2 \ \sigma_m^2$, and an unsystematic risk component, $Var(u_{it})$. The systematic risk represents that movement in the security's return that is related to general market conditions and, as a consequence, cannot be diversified away. The unsystematic risk, however, denotes that portion of the risk of the security return that is unrelated to general market conditions. Representing risk unrelated to general market conditions, unsystematic risk generally results from variations in the security's returns that are caused by firm-unique factors.

The effect of Diversification

Scholarly inquiry into the behavior of the securities market and the related formulation of the various forms of the efficient market hypothesis have contributed to the development of portfolio theory as well. The theory emphasizes that the relevant level of concern to the decision maker is the portfolio level, not the individual security level. In this regard, individuals evaluate the risk of the portfolio as a whole rather than the risk of each security that comprises the portfolio.

Hence, the impact of an individual security's return is relevant only to the extent that it affects the portfolio parameters of risk and return.

From the portfolio standpoint, the unsystematic risk component of a security may be reduced or eliminated through diversification. In the case of a portfolio in which an equal amount, x_i, is invested in each of the n securities, the variance of the return on the portfolio is given by:

$$\sigma_p^2 = \sum_{i=1}^{n} x_i^2 \sigma_i^2 + 2 \sum_i \sum_j X_i X_j \sigma_{ij} . \qquad \text{(A-9)}$$

Rearranging this equation, the variance of the portfolio becomes:

$$\sigma_p^2 = \frac{1}{n^2} \left[\sum_{i=1}^{n} \sigma_i^2 + \sum_{i-1}^{n} \sum_{j-1}^{n} \sigma_{ij} \right] . \qquad \text{(A-10)}$$

Substituting from Equation (A-8):

$$\sigma_p^2 = \frac{1}{n^2} \left\{ \sum_{i=1}^{n} [B_i^2 \sigma_m^2 + \mathrm{Var}(u_{it})] + \sum_{i=1}^{n} \sum_{j=1}^{n} B_i B_j \sigma_m^2 . \right. \qquad \text{(A-11)}$$

Equation (A-11) can be rewritten as:

$$\sigma_p^2 = \bar{B}^2 \sigma_m^2 + \frac{1}{n} \overline{\mathrm{Var}(u_{it})} \qquad \text{(A-12)}$$

where the bar indicates an average.

Upon examination of Equation (A-12) it is clear that as an investor diversifies his portfolio by increasing the number of securities n, the last term in the equation will decrease. In an empirical study by Evans and Archer, it was shown that the effects of diversification occur quite rapidly as one introduces additional securities, and with ten or more securities in the portfolio most of the effects of diversification have already occurred (28). Thus, for a well diversified portfolio the variance of the portfolio return will approximate $\bar{B}^2 \sigma_m^2$. Since the variance of the market return, σ_m^2, is a constant, $\bar{B}$ becomes the relevant factor in the consideration of portfolio risk.

APPENDIX B

DATA SUMMATION

TABLE B-1. Summary of firms--Sample 1 (Consistency Qualifications).

Firm Number	Firm	Qualification Type**	ATT Year
1	ACF Industries	Pensions	1969
2	Amalgamated Sugar	*Other	1968
3	American Air Filter	Depreciation	1969
4	Akzona, Inc.	Depreciation	1970
5	American Standard	*Other	1968
6	American Brands	*Consolidation	1968
7	Armco Steel	Depreciation	1969
8	Armstrong Cork	*Consolidation	1968
9	Babcock & Wilcox	Depreciation	1969
10	Bell & Howell	Inventory	1971
11	Bond Industries	Inventory	1969
12	Borg-Warner	*Consolidation	1970
13	Bristol-Myers	*Consolidation	1968
14	Burlington	Inventory	1970
15	Campbell Soup	Depreciation	1971
16	Carrier	*Consolidation	1969
17	Chrysler Corp.	*Inventory	1971
18	Cleveland Cliffs	*Consolidation	1968
19	Collins & Aikman	Depreciation	1971
20	Crane	Depreciation	1970
21	Cyclops	Depreciation	1969
22	Eastman Kodak	*Consolidation	1968
23	Fairchild Industries	Pensions	1971
24	Flintkote	*Other	1968
25	Foote Mineral	Other	1968
26	Garlocke	Depreciation	1971
27	GATX Corp.	*Consolidation	1971
28	General Tire	Depreciation	1970
29	Houdaille Industries	Depreciation	1970
30	Indian Head	*Other	1969
31	Johnson & Johnson	*Consolidation	1971
32	Kelsey-Hayes	*Consolidation	1969
33	Kimberly-Clark	*Other	1969
34	Macke	Other	1970
35	Medusa	Other	1971

TABLE B-1. (continued)

Firm Number	Firm	Qualification Type**	ATT Year
36	Marcor	*Consolidation	1971
37	G. C. Murphy	Pensions	1969
38	National Presto	*Other	1968
39	ConAgra	*Other	1971
40	J. C. Penney	*Consolidation	1968
41	Pet, Inc.	Depreciation	1968
42	Phillips Petroleum	*Consolidation	1968
43	Raybestos-Manhatten	Pensions	1968
44	Republic Steel	Depreciation	1969
45	Ampco-Pittsburgh	Pensions	1968
46	SCOA Industries	Other	1969
47	A. E. Stanley Mfg.	*Consolidation	1969
48	Standard Pressed Steel	Inventory	1969
49	Stokely-Van Camp	Depreciation	1970
50	Sun Oil	*Other	1971
51	Texaco	*Consolidation	1970
52	Textron	*Other	1969
53	Timken Co.	Pensions	1970
54	Triangle Industries	Inventory	1970
55	Trans Union	Consolidation	1969
56	U. S. Gypsum	Other	1968
57	Varian Associates	*Other	1971
58	Westinghouse Electric	*Consolidation	1971
59	Alan Wood Steel	Depreciation	1969

*Restatement reference.

**Represents classification per ATT.

TABLE B-2. Summary of firms--Sample 2 (Uncertainty Qualifications).

Firm Number	Firm	Qualification Type*	ATT Year
1	W. R. Grace	Foreign Takeover	1971
2	American Ship Building	Sales Claims	1969
3	IPCO Hospital Supply	Insurance Claim	1971
4	Bates Manufacturing	Tax Dispute	1970
5	Bemis Company	Other	1971
6	Dayco	Litigation	1971
7	Graniteville	Other	1971
8	Grummen	Tax Renegotiation	1969
9	Holly Sugar	Sales Claims	1971
10	Howmet	Litigation	1970
11	Lehigh Portland	Other	1970
12	Maremont	Litigation	1968
13	Martin-Marietta	Other	1968
14	Melville Shoe	Litigation	1970
15	Pepsico	Tax Dispute	1968
16	Pfizer	Litigation	1968
17	R. J. Reynolds	Litigation	1970
18	Superior Oil	Other	1971
19	Warner-Lambert	Other	1971
20	General Resources	Tax Dispute	1969

*Represents classification per ATT.

TABLE B-3. Summary of firms--Sample 3 (Control Sample 1).

Firm Number	Firm	ATT Year
1	F. W. Woolworth	1969
2	Wm. Wrigley, Jr., Co.	1970
3	Abbott Laboratories	1970
4	Airco	1968
5	Apco Oil	1970
6	Atlantic-Richfield	1968
7	Avon	1968
8	Blue Bell	1971
9	Brockway Glass	1970
10	Brown Group	1968
11	Burroughs	1969
12	Caterpillar Tractor	1968
13	Coca-Cola	1969
14	Cooper Industries	1969
15	Crown Cork	1969
16	Crown Zellerbach	1969
17	Cummins Engine	1968
18	Dravo	1970
19	Eagle-Picher	1971
20	Hershey Foods	1971
21	Emhart	1971
22	Fedders	1970
23	First National Stores	1969
24	Freeport Mineral	1968
25	General Foods	1968
26	General Motors	1971
27	General Signal	1969
28	Great Atlantic & Pacific	1969
29	Hobart Manufacturing	1971
30	Ingersoll Rand	1971
31	Interlake	1971
32	International Business Machines	1969
33	Interstate Brands	1971
34	Jim Walter Corp.	1968
35	R. H. Macy	1970
36	Maytag	1969
37	McGraw-Hill	1971
38	Mobil	1968
39	Kraftco	1971
40	National Distillers	1971

TABLE B-3. (continued)

Firm Number	Firm	ATT Year
41	Outboard Marine	1969
42	Proctor & Gamble	1969
43	Quaker State Oil	1968
44	Duplan	1971
45	G. D. Searle	1968
46	Singer Company	1971
47	Standard Brands	1969
48	Sun Chemical	1968
49	Tobin Packing	1968
50	Union Camp	1969
51	U. S. Tobacco	1968
52	Walgreen Company	1970
53	Anheuser-Busch	1968
54	Sears Industries	1969
55	Goldblatt Brothers	1969
56	George A. Hormel	1970
57	Mount Vernon Mills	1970
58	Pratt & Lambert	1970
59	Tecumseh Products	1969

TABLE B-4. Summary of firms--Sample 4 (Control Sample 2).

Firm Number	Firm	ATT Year
1	Parker Pen	1971
2	Phillip Morris	1968
3	Square D	1971
4	Abbott Laboratories	1970
5	Airco	1968
6	American Home Products	1971
7	Motorola	1968
8	Briggs & Stratton	1971
9	Brockway Glass	1971
10	Brown Group	1971
11	Caterpillar Tractor	1970
12	Coca-Cola	1969
13	Falstaff	1968
14	Neptune Meter	1970
15	Georgia Pacific	1971
16	Ingersoll Rand	1969
17	Interlake	1971
18	Jim Walter	1970
19	Marshall Fields	1969
20	Masonite	1970

TABLE B-5. Beta coefficient by firm--Sample 1.

Firm	Beta-Month -37	Standard Error Month -37	Beta-Month 0	Standard Error Month 0	Beta-Month 37
1	1.3138	0.2736	1.2234	0.3391	1.1114
2	0.6747	0.4411	0.3929	0.2817	0.5266
3	1.3065	0.3493	0.8950	0.3704	1.2201
4	1.7024	0.3596	0.9332	0.2366	1.1508
5	1.3944	0.3403	1.3601	0.3477	1.2698
6	0.9849	0.3027	0.7080	0.2041	0.5111
7	0.9490	0.2050	0.8128	0.2154	1.3514
8	0.9993	0.3251	1.1260	0.2103	1.2852
9	1.3214	0.3542	1.5489	0.3286	1.8605
10	1.4107	0.3026	1.6596	0.3333	1.4893
11	0.7816	0.3471	1.0432	0.2729	1.5823
12	1.3637	0.2120	1.2761	0.2047	0.2049
13	1.1439	0.2389	1.1233	0.2313	0.7625
14	0.7175	0.2884	0.8694	0.2244	1.9882
15	1.0045	0.2644	0.7559	0.1959	0.7925
16	1.7457	0.3746	0.8356	0.2699	0.8489
17	1.3858	0.2691	1.6214	0.2608	1.0908
18	1.8280	0.2764	1.0997	0.3172	1.0199
19	0.9006	0.3800	1.5425	0.2828	0.9222
20	1.5395	0.4099	1.0650	0.2217	0.7774
21	0.8628	0.2567	0.6324	0.3092	1.0554
22	1.1897	0.2181	0.8154	0.1686	0.7565
23	1.3775	0.4491	1.2250	0.4429	1.1012
24	1.0959	0.3288	1.8380	0.2924	1.4463
25	1.5228	0.4803	0.9072	0.4285	1.1063
26	0.8665	0.2771	0.9509	0.2189	0.6331
27	1.2177	0.3171	1.0221	0.2315	1.2448
28	1.1577	0.3315	1.2708	0.2341	1.5662
29	1.3962	0.3389	1.2552	0.2446	1.6068
30	1.5591	0.3801	1.8768	0.2453	0.8201
31	0.9495	0.2156	0.6533	0.2231	0.7336
32	1.0609	0.2859	1.3796	0.3115	1.0028
33	1.3359	0.1812	0.9103	0.2373	0.6350
34	1.6879	0.4016	1.4440	0.3462	1.6698
35	1.1734	0.2923	1.3120	0.2543	1.1769
36	1.8136	0.4095	1.2370	0.3074	1.1775
37	1.0292	0.1601	0.9271	0.2759	1.1181
38	1.1469	0.3813	1.5146	0.3780	0.9233
39	0.8184	0.4556	1.2044	0.2937	0.7464
40	1.0096	0.2734	1.4272	0.2325	1.1186

TABLE B-5. (continued)

Firm	Beta Month -37	Standard Error Month -37	Beta- Month 0	Standard Error Month 0	Beta- Month 37
41	1.2883	0.2948	1.4940	0.3570	0.6249
42	0.7008	0.2210	1.3894	0.2816	0.9724
43	0.3522	0.2547	0.4092	0.2517	1.6186
44	1.0293	0.1992	0.6430	0.1768	1.0417
45	1.2288	0.2580	0.9226	0.2107	0.7519
46	1.0474	0.5889	1.4948	0.5556	1.5729
47	0.8766	0.2132	1.1139	0.3865	2.6321
48	0.7860	0.2327	0.7526	0.2508	0.6229
49	1.5991	0.4531	1.2739	0.3055	1.6811
50	1.2375	0.4343	1.5956	0.3887	1.2913
51	0.7707	0.2030	0.7899	0.2232	0.4534
52	0.8373	0.1689	0.9894	0.1731	0.8879
53	1.2131	0.3383	1.5287	0.3156	1.9285
54	0.9410	0.1911	0.8507	0.1622	1.2410
55	1.3335	0.5267	1.0045	0.2882	0.8920
56	0.8814	0.2218	0.4385	0.2424	1.4896
57	0.6668	0.2046	1.3555	0.2788	0.9415
58	1.0820	0.4550	1.8348	0.3773	1.6358
59	1.1977	0.3230	0.5917	0.3219	1.1781

TABLE B-6. Beta coefficient by firm--Sample 2.

Firm	Beta-Month -37	Standard Error Month -37	Beta-Month 0	Standard Error Month 0	Beta-Month 37
1	1.0548	0.3351	0.8860	0.2877	1.0121
2	1.7674	0.5120	0.9473	0.4368	2.0272
3	1.5551	0.5438	1.6623	0.2725	2.4294
4	1.8691	0.5073	1.0433	0.4689	0.4934
5	1.0939	0.2974	1.2649	0.3883	1.0999
6	1.3522	0.3146	1.5926	0.2927	0.6539
7	0.9607	0.2974	0.8883	0.3848	1.1810
8	1.2478	0.5069	0.8539	0.3222	1.3571
9	1.1054	0.2836	0.9273	0.2970	0.6474
10	1.2761	0.4135	0.3665	0.2996	1.5067
11	0.9422	0.4004	1.5026	0.3688	1.1088
12	1.2216	0.3158	1.2253	0.3019	0.8233
13	0.8440	0.4485	1.3628	0.2659	1.9221
14	0.7118	0.3096	0.8179	0.1986	1.3199
15	1.1606	0.4034	0.8813	0.2149	0.7732
16	1.2359	0.3346	1.3274	0.2365	0.8656
17	0.9281	0.2388	0.3737	0.2189	0.7690
18	1.6108	0.3008	1.5122	0.3073	0.7416
19	1.0801	0.2044	0.7283	0.1635	1.2567
20	2.0979	0.8596	1.0058	0.5624	0.9854

TABLE B-7. Beta coefficient by firm--Sample 3.

Firm	Beta-Month -37	Standard Error Month -37	Beta-Month 0	Standard Error Month 0	Beta-Month 37
1	1.3229	0.2786	1.2414	0.2160	1.0186
2	0.2038	0.1701	0.7894	0.2300	1.1160
3	0.4840	0.2958	0.6463	0.1809	1.2508
4	1.3121	0.2241	1.0992	0.3133	1.5840
5	1.4726	0.4204	1.6694	0.4308	1.2380
6	0.7703	0.2504	1.0347	0.3414	1.6698
7	1.0256	0.3387	0.8204	0.2642	0.7654
8	1.1753	0.3309	1.2385	0.3047	1.4284
9	0.6965	0.3735	0.8122	0.2875	0.8786
10	1.0400	0.2259	0.5964	0.2725	0.8675
11	1.0294	0.5286	1.2261	0.2627	0.0806
12	1.0059	0.4091	1.4816	0.2321	1.2844
13	0.6423	0.2252	0.7630	0.1469	0.5377
14	1.7273	0.3513	1.3119	0.3698	2.3722
15	0.7425	0.3655	0.8319	0.1969	0.9662
16	1.0802	0.2411	1.2220	0.2017	1.3758
17	0.8745	0.4524	0.8472	0.3105	1.2268
18	1.5685	0.3238	1.0476	0.2326	0.7854
19	0.6047	0.2689	1.0973	0.2680	1.3811
20	0.6521	0.2340	0.2547	0.1970	0.9572
21	1.3145	0.2678	1.5482	0.2328	0.7340
22	1.5317	0.4240	2.1036	0.2451	1.9874
23	0.7371	0.3499	1.1069	0.3448	1.1586
24	1.4434	0.3627	1.2910	0.3994	1.5748
25	0.6318	0.2512	0.9595	0.1991	0.5388
26	1.0444	0.1509	0.9376	0.1394	0.7873
27	1.8815	0.3679	1.1519	0.3229	1.0694
28	0.5991	0.2937	0.9833	0.2967	0.8470
29	0.6838	0.2455	0.6193	0.2083	1.3606
30	1.1744	0.2086	1.0410	0.2153	1.1543
31	0.9226	0.2323	0.9629	0.2025	0.7478
32	0.9286	0.o907	0.9029	0.1621	0.8525
33	0.6318	0.3814	0.6596	0.2468	1.3223
34	0.9425	0.5390	2.4275	0.4113	1.6420
35	0.8909	0.2678	1.8034	0.1995	2.3710
36	0.8744	0.2227	1.2877	0.2475	1.0709
37	0.9817	0.2782	1.8669	0.3194	0.9947
38	0.5541	0.2995	1.0184	0.2821	0.7593
39	0.8930	0.2123	0.9251	0.1840	0.8413
40	0.4765	0.2006	0.7768	0.2047	0.4817

TABLE B-7. (continued)

Firm	Beta-Month -37	Standard Error Month -37	Beta-Month 0	Standard Error Month 0	Beta-Month 37
41	1.7637	0.4092	1.3735	0.3270	2.4790
42	0.1121	0.1975	0.7578	0.1971	0.6466
43	1.1598	0.4739	0.9293	0.3334	1.2202
44	2.9374	0.6647	1.3672	0.5290	1.9440
45	0.9892	0.5501	1.1454	0.2616	1.2020
46	1.2456	0.2277	1.1097	0.2201	1.0026
47	0.6074	0.2237	0.7549	0.2168	0.8126
48	1.9086	0.6329	2.0676	0.3934	1.8100
49	0.1369	0.3206	0.8780	0.2965	1.3252
50	1.4667	0.2746	1.2967	0.2026	0.8647
51	0.5476	0.1729	0.6186	0.2457	0.8617
52	0.7190	0.2981	1.3959	0.2469	1.4807
53	0.9290	0.3636	0.6480	0.3472	0.7983
54	0.7358	0.4420	1.1966	0.4151	1.6580
55	0.4105	0.6116	1.4060	0.4456	2.1367
56	1.3017	0.3213	0.6722	0.2757	0.1945
57	0.8256	0.3341	0.7790	0.2419	0.3992
58	0.5349	0.2583	0.4951	0.2862	0.8291
59	0.9988	0.3602	1.3216	0.2919	1.4137

TABLE B-8. Beta coefficient by firm--Sample 4.

Firm	Beta-Month -37	Standard Error Month -37	Beta-Month 0	Standard Error Month 0	Beta-Month 37
1	1.7017	0.4593	1.3198	0.3712	1.3518
2	1.0812	0.3370	1.1981	0.2989	0.8978
3	1.3852	0.2893	0.7295	0.1614	1.1491
4	0.4840	0.2958	0.6463	0.1809	1.2508
5	1.3121	0.2241	1.0992	0.3133	1.5840
6	0.9623	0.1876	0.6779	0.1447	0.0479
7	1.5011	0.4430	1.4598	0.4339	1.9079
8	0.4925	0.1636	0.7654	0.1998	1.3071
9	0.6965	0.3735	0.8122	0.2875	0.8786
10	0.6625	0.2802	0.8534	0.2644	0.6902
11	1.3292	0.2796	1.2278	0.1985	0.9705
12	0.6423	0.2252	0.7630	0.1469	0.5377
13	0.6692	0.3721	1.1625	0.3840	1.6053
14	1.4384	0.4503	1.6748	0.4410	1.4762
15	1.0984	0.2996	1.0251	0.2223	1.6684
16	1.3675	0.2304	0.9640	0.2135	1.0227
17	0.9226	0.2323	0.9629	0.2025	0.7478
18	2.0947	0.4403	1.8902	0.2912	1.3035
19	1.3349	0.3075	1.2459	0.2169	1.4203
20	1.7510	0.3252	1.8740	0.2346	0.8054

TABLE B-9. Variance of the residuals by firm for Sample 1.

Firm	Variance-Residuals Month -37	Variance-Residuals Month 0	Variance-Residuals Month 37
1	0.00186	0.00600	0.00278
2	0.00383	0.00407	0.00195
3	0.00443	0.00865	0.00972
4	0.00594	0.00391	0.00533
5	0.00308	0.00685	0.01099
6	0.00227	0.00210	0.00238
7	0.00160	0.00313	0.00283
8	0.00281	0.00251	0.00359
9	0.00479	0.00729	0.00846
10	0.00519	0.00708	0.01084
11	0.00392	0.00466	0.01478
12	0.00203	0.00293	0.00446
13	0.00152	0.00303	0.00267
14	0.00397	0.00338	0.00740
15	0.00363	0.00276	0.00439
16	0.00510	0.00459	0.00423
17	0.00410	0.00434	0.01450
18	0.00203	0.00570	0.00328
19	0.00652	0.00562	0.01042
20	0.00758	0.00338	0.00765
21	0.00251	0.00645	0.00519
22	0.00127	0.00161	0.00205
23	0.01143	0.01250	0.01116
24	0.00288	0.00485	0.00357
25	0.00614	0.01041	0.00680
26	0.00435	0.00305	0.00512
27	0.00570	0.00342	0.00524
28	0.00496	0.00377	0.00559
29	0.00518	0.00412	0.00342
30	0.00549	0.00408	0.00513
31	0.00257	0.00336	0.00260
32	0.00266	0.00607	0.00943
33	0.00125	0.00380	0.00440
34	0.00769	0.00802	0.00673
35	0.00484	0.00412	0.00706
36	0.00847	0.00589	0.01119
37	0.00098	0.00514	0.00454
38	0.00360	0.00721	0.00407
39	0.01078	0.00621	0.01924
40	0.00185	0.00273	0.00200

TABLE B-9. (continued)

Firm	Variance-Residuals Month -37	Variance-Residuals Month 0	Variance-Residuals Month 37
41	0.00228	0.00589	0.00393
42	0.00130	0.00450	0.00775
43	0.00173	0.00359	0.00796
44	0.00151	0.00211	0.00359
45	0.00369	0.00300	0.01028
46	0.00924	0.01750	0.00510
47	0.00176	0.01029	0.01124
48	0.00195	0.00401	0.00285
49	0.00783	0.00630	0.01290
50	0.00798	0.01099	0.00438
51	0.00234	0.00317	0.00586
52	0.00131	0.00209	0.00325
53	0.00437	0.00672	0.00572
54	0.00165	0.00184	0.00176
55	0.01275	0.00580	0.00740
56	0.00222	0.00404	0.00678
57	0.00111	0.00441	0.00269
58	0.01063	0.01003	0.00950
59	0.00397	0.00703	0.00529

TABLE B-10. Variance of the residuals by firm for Sample 2.

Firm	Variance-Residuals Month -37	Variance-Residuals Month 0	Variance Residuals Month 37
1	0.00567	0.00516	0.00365
2	0.00854	0.01194	0.00855
3	0.01506	0.00552	0.01726
4	0.01183	0.01535	0.01127
5	0.00501	0.00961	0.00854
6	0.00548	0.00579	0.00590
7	0.00489	0.01000	0.00410
8	0.00980	0.00701	0.01475
9	0.00372	0.00619	0.01092
10	0.00771	0.00628	0.00866
11	0.00723	0.00951	0.00826
12	0.00247	0.00460	0.01549
13	0.00498	0.00357	0.00351
14	0.00440	0.00275	0.01259
15	0.00403	0.00233	0.00212
16	0.00221	0.00310	0.00227
17	0.00257	0.00335	0.00456
18	0.00457	0.00588	0.00616
19	0.00237	0.00170	0.00292
20	0.02683	0.01994	0.01662

TABLE B-11. Variance of the residuals by firm for Sample 3.

Firm	Variance-Residuals Month -37	Variance-Residuals Month 0	Variance-Residuals Month 37
1	0.00296	0.00315	0.00492
2	0.00130	0.00364	0.00400
3	0.00395	0.00229	0.00326
4	0.00124	0.00495	0.00725
5	0.00797	0.01298	0.01207
6	0.00167	0.00661	0.00492
7	0.00226	0.00386	0.00229
8	0.00562	0.00654	0.01697
9	0.00772	0.00558	0.00892
10	0.00100	0.00381	0.00508
11	0.01062	0.00468	0.00272
12	0.00330	0.00298	0.00277
13	0.00193	0.00146	0.00091
14	0.00469	0.00928	0.00506
15	0.00510	0.00262	0.00314
16	0.00221	0.00276	0.00566
17	0.00545	0.00547	0.00401
18	0.00473	0.00372	0.00656
19	0.00400	0.00485	0.00420
20	0.00310	0.00247	0.00687
21	0.00407	0.00346	0.00519
22	0.00878	0.00430	0.01281
23	0.00306	0.00614	0.00640
24	0.00325	0.00805	0.00548
25	0.00158	0.00205	0.00349
26	0.00129	0.00124	0.00402
27	0.00516	0.00704	0.00335
28	0.00226	0.00452	0.00330
29	0.00304	0.00270	0.00672
30	0.00247	0.00295	0.00555
31	0.00299	0.00277	0.00275
32	0.00138	0.00178	0.00114
33	0.00805	0.00411	0.02341
34	0.00501	0.00873	0.00437
35	0.00307	0.00280	0.00671
36	0.00189	0.00416	0.00314
37	0.00439	0.00650	0.00932
38	0.00222	0.00402	0.00302
39	0.00255	0.00216	0.00558
40	0.00223	0.00283	0.00338

TABLE B-11. (continued)

Firm	Variance-Residuals Month -37	Variance-Residuals Month 0	Variance-Residuals Month 37
41	0.00545	0.00669	0.00521
42	0.00116	0.00216	0.00136
43	0.00598	0.00630	0.00416
44	0.02269	0.01973	0.02120
45	0.00596	0.00379	0.00357
46	0.00262	0.00302	0.01010
47	0.00191	0.00317	0.00111
48	0.01066	0.00877	0.00905
49	0.00206	0.00451	0.00963
50	0.00288	0.00277	0.00590
51	0.00059	0.00334	0.00305
52	0.00425	0.00409	0.00441
53	0.00327	0.00609	0.00245
54	0.00745	0.01163	0.01346
55	0.01451	0.01367	0.00777
56	0.00493	0.00510	0.00597
57	0.00504	0.00409	0.00280
58	0.00301	0.00573	0.00214
59	0.00503	0.00587	0.00571

TABLE B-12. Variance of the residuals by firm for Sample 4.

Firm	Variance-Residuals Month -37	Variance-Residuals Month 0	Variance-Residuals Month 37
1	0.00952	0.00968	0.00880
2	0.00224	0.00495	0.00349
3	0.00474	0.00166	0.00913
4	0.00395	0.00229	0.00326
5	0.00124	0.00495	0.00725
6	0.00195	0.00141	0.00458
7	0.00522	0.01067	0.00641
8	0.00136	0.00297	0.00440
9	0.00772	0.00558	0.00892
10	0.00403	0.00496	0.00375
11	0.00353	0.00271	0.00204
12	0.00193	0.00146	0.00091
13	0.00371	0.00836	0.01196
14	0.00932	0.01358	0.01077
15	0.00509	0.00315	0.00368
16	0.00203	0.00308	0.00271
17	0.00299	0.00277	0.00275
18	0.00947	0.00607	0.00916
19	0.00367	0.00324	0.00357
20	0.00517	0.00394	0.00401

TABLE B-13. F values for test of significance, unsystematic risk--Sample 1 (Consistency Qualifications).

Sample 1	M_{-36} to M_0	M_0 to M_{36}
1	0.31032765	2.15704918*
2	0.93907344	2.08477497
3	0.51235694	0.88951951
4	1.52016735	0.73350811
5	0.44985420	0.62379718
6	1.07814312	0.88531268
7	0.51183110	1.10564613
8	1.12288570	0.69935453
9	0.65702480	0.86135578
10	0.73308367	0.65290236
11	0.84154278	0.31541896
12	0.69178665	0.65668339
13	0.50090188	1.13525391
14	1.17736244	0.45649552
15	1.31389427	0.62857443
16	1.10965919	1.08468151
17	0.94641560	0.29914039
18	0.35651165	1.73700905
19	1.16042328	0.53914922
20	2.24004841*	0.44246727
21	0.38954800	1.24406338
22	0.78635335	0.78574663
23	0.91448390	1.12034702
24	0.59408385	1.35579872
25	0.59006315	1.53078365
26	1.42587757	0.59625405
27	1.66766930	0.65212041
28	1.31525803	0.67390478
29	1.25893974	1.20427513
30	1.34604931	0.79593909
31	0.76529765	1.29202557
32	0.43852311	0.64353389
33	0.32960737	0.86383641
34	0.95893377	o.19209576
35	1.17537117	0.58354473
36	1.43843365	0.52591759
37	0.19042522	1.13115120
38	0.49887019	1.77189541
39	1.73651218	0.32266366
40	0.67799044	1.36689854

TABLE B-13. (continued)

Sample 1	M_{-36} to M_0	M_0 to M_{36}
41	0.38696319	1.49847698
42	0.28922457	0.58007210
43	0.48110038	0.45079160
44	0.71689957	0.58842278
45	1.22852707	0.29176688
46	0.52780300	3.42779350*
47	0.17154137	0.91476214
48	0.48743176	0.40670109
49	1.24336433	0.48833448
50	0.72624838	2.50835896*
51	0.73594183	0.54216343
52	0.62622637	0.64399332
53	0.64961892	1.17420769
54	0.89522219	1.04351330
55	2.19801903*	0.78365850
56	0.54873079	0.59614444
57	0.25279635	1.63717270
58	1.05937386	1.05605793
59	0.56437767	1.32794571

*Significant at an alpha level of 0.05.

TABLE B-14. F values for test of significance, unsystematic risk--Sample 2 (Uncertainty Qualifications).

Sample 2	M_{-36} to M_0	M_0 to M_{36}
1	1.09959507	1.41164589
2	0.71500224	1.39667225
3	2.72629642*	0.32001130
4	0.77029169	1.36226845
5	0.52176708	1.12465000
6	0.94649911	0.98060954
7	0.48955524	2.44161320
8	1.39927578	0.47494262
9	0.60031962	0.56673276
10	1.22814941	0.72486913
11	0.76024878	1.15206337
12	0.53646874	0.29697120
13	1.39489937	1.01722717
14	1.59900475	0.21873689
15	1.72724724	1.09796047
16	0.71272713	1.36288071
17	0.76786643	0.73414713
18	0.77640301	0.95491529
19	1.39183521	0.58316219
20	1.34569454	1.19964123

*Significant at an alpha level of 0.05.

TABLE B-15. F values for test of significance, unsystematic risk--Sample 3 (Control Sample 1).

Sample 3	M_{-36} to M_0	M_0 to M_{36}
1	0.94117123	0.63958478
2	0.35848445	0.91033524
3	1.72505188	0.70092249
4	0.25083971	0.68286043
5	0.61409932	1.07539940
6	0.25263566	1.34230232
7	0.58507723	1.68520260
8	0.85936415	0.38549286
9	1.38303185	0.62583554
10	0.26331174	0.75126803
11	2.26865101*	1.72268867
12	1.10558701	1.07602882
13	1.32859707	1.59752655
14	0.50561893	1.83395863
15	1.94844818	0.83396083
16	0.80050838	0.48748970
17	0.99719733	1.36286259
18	1.27055359	0.56731302
19	0.82518542	1.15473652
20	1.25429058	0.36009026
21	1.17681408	0.66535318
22	2.04356194*	0.33537048
23	0.49891120	0.95905393
24	0.40421963	1.47008705
25	0.77136928	0.58617502
26	1.04312992	0.30796885
27	0.73394626	2.09844494*
28	0.49925798	1.37164307
29	1.12444210	0.40265179
30	0.83502185	0.53186315
31	1.07894135	1.00841999
32	0.77522212	1.55852032
33	1.95664597	0.17582154
34	0.57380593	1.99624348*
35	1.09648132	0.41702127
36	0.45378762	1.32573795
37	0.67462569	0.69790190
38	0.55255139	1.32859516
39	1.18424797	0.38675213
40	0.78682435	0.83784002

TABLE B-15. (continued)

Sample 3	M_{-36} to M_0	M_0 to M_{36}
41	0.81456143	1.28393269
42	0.53744185	1.58849144
43	0.94911134	1.51315308
44	1.15011883	0.93059474
45	1.57387352	1.06037998
46	0.86669266	0.29890537
47	0.60181403	2.86575985*
48	1.21538353	0.97000521
49	0.45746285	0.46823788
50	1.03868008	0.46948773
51	0.17622608	1.09678078
52	1.03908157	0.92762113
53	0.53757918	2.48451042*
54	0.64096504	0.86380315
55	1.06163025	1.75964260
56	0.96801460	0.85393167
57	1.22992229	1.46429539
58	0.52536350	2.67791653*
59	0.85819769	1.02723408

*Significant at an alpha level of 0.05.

TABLE B-16. F values for test of significance, unsystematic risk--Sample 4 (Control Sample 2).

Sample 4	M_{-36} to M_0	M_0 to M_{36}
1	0.98371786	1.09985542
2	0.45236599	1.41911793
3	2.85714817*	0.18193078
4	1.72505188	0.70092249
5	0.25083971	0.68286043
6	1.37731647	0.30861223
7	0.48949212	1.66413689
8	0.45912081	0.67460841
9	1.38303185	0.62583554
10	0.81103277	1.32242870
11	1.30089092	1.32830238
12	1.32859707	1.59752655
13	0.44353291	0.69852233
14	0.68615502	1.26165104
15	1.61542130	0.85545617
16	0.65850800	1.13479900
17	1.07894135	1.00841999
18	1.56102848	0.66243947
19	1.13215923	0.90746075
20	1.31167698	0.98252749

*Significant at an alpha level of 0.05.

TABLE B-17. Subcategorization by opinion type, systematic risk--frequency of significant risk changes.

	M_{-36} to M_0		M_0 to M_{36}	
	Significant Change	No Significant Change	Significant Change	No Significant Change
CONSISTENCY				
Depreciation	1	14	4	11
Pensions	0	6	1	5
Consolidation	3	14	1	16
Inventory	0	6	4	2
Other	4	11	0	15
TOTALS	8	51	10	49
UNCERTAINTY				
Litigation	1	5	3	3
Valuation	0	2	1	1
Tax Disputes	0	4	0	4
Sales Claims	0	2	0	2
Other	0	6	3	3
TOTALS	1	19	7	13

TABLE B-18. Subcategorization by opinion type, systematic risk--frequency of risk level changes.

	M_{-36} to M_0		M_0 to M_{36}	
	Increase	Decrease	Increase	Decrease
CONSISTENCY				
Depreciation	5	10*	11	4*
Pensions	2	4*	3	3*
Consolidation	7	10*	5	12*
Inventory	4	2*	3	3*
Other	10	5*	5	10*
TOTALS	28	31	27	32
UNCERTAINTY				
Litigation	5	1*	4	2*
Valuation	1	1*	2	0*
Tax Disputes	0	4*	1	3*
Sales Claims	1	1*	1	1*
Other	3	3*	3	3*
TOTALS	10	10	11	9

*The Binomial Test (see Siegel (64), pp. 36-42) is applied to the data to test whether the number of increases and decreases significantly differs. At an alpha level of 0.05, no significant difference is noted.

TABLE B-19. Subcategorization by opinion type, unsystematic risk--frequency of significant risk changes.

	M_{-36} to M_0		M_0 to M_{36}	
	Significant Change	No Significant Change	Significant Change	No Significant Change
CONSISTENCY				
Depreciation	1	14	0	15
Pensions	0	6	1	5
Consolidation	1	16	0	17
Inventory	0	6	0	6
Other	0	15	3	12
TOTALS	2	57	4	55
UNCERTAINTY				
Litigation	0	6	0	6
Valuation	1	1	0	2
Tax Disputes	0	4	0	4
Sales Claims	0	2	1	1
Other	0	6	0	6
TOTALS	1	19	1	19

TABLE B-20. Subcategorization by opinion type, unsystematic risk--frequency of risk level changes.

	M_{-36} to M_0		M_0 to M_{36}	
	Increase	Decrease	Increase	Decrease
CONSISTENCY				
Depreciation	7	8*	10	5*
Pensions	5	1*	2	4*
Consolidation	10	7*	11	6*
Inventory	5	1*	4	2*
Other	12	3**	7	8*
TOTALS	39	20	34	25
UNCERTAINTY				
Litigation	4	2*	5	1*
Valuation	0	2*	1	1*
Tax Disputes	1	3*	1	3*
Sales Claims	2	0*	1	1*
Other	4	2*	2	4*
TOTALS	11	9	10	10

*The Binomial Test (see Siegel (64), pp. 36-42) is applied to the data to test whether the number of increases and decreases significantly differs. At an alpha level of 0.05, no significant difference is noted.

**Significant at an alpha level of 0.036 based on the application of the Binomial Test to the number of increases and decreases.

TABLE B-21. Frequency distribution of industry types* by samples.

	Sample			
	1	2	3	4
Number of Industries	30	14	24	14
	8	3	13	3
	3	0	3	0
	1	0	0	0
Total Industries Represented	42	17	40	17

*Industry classifications are based on the Standard Industrial Classification (SIC) Code as stated by the United States Department of Commerce.

CHI-SQUARE VALUES ADJUSTED AND UNADJUSTED FOR CONTINUITY

The formulas for the chi-square (X^2) statistic when the matrix appears as shown are as follows:

MATRIX

A	B
C	D

Unadjusted for continuity:

$$X^2 = \frac{N\,(AD - BC)^2}{(A+B)(C+D)(A+C)(B+D)}$$

Adjusted for continuity:

$$X^2 = \frac{N\,(|AD - BC| - N/2)^2}{(A+B)(C+D)(A+C)(B+D)}$$

The chi-square statistics adjusted and unadjusted for continuity for each of the twelve matrices are shown in Table B-22.

TABLE B-22. Adjusted and unadjusted chi-square statistics for the twelve matrices.

Matrix	Unadjusted	Adjusted
1	0.262	0.066
2	0.058	0.000
3	0.000	0.526
4	0.000	0.110
5	2.185	1.673
6	0.847	0.542
7	0.000	0.100
8	0.102	0.000
9	0.000	0.259
10	0.000	0.112
11	0.000	0.526
12	0.003	0.926
13	0.329	0.146
14	0.138	0.035
15	0.400	0.100
16	0.100	0.000

TABLE B-23. Average variance of the residuals for the analysis period by sample.

Month	Sample 1	Sample 2	Sample 3	Sample 4
-36	0.004244	0.006968	0.004389	0.004443
-35	0.004233	0.006927	0.004403	0.004618
-34	0.004252	0.006920	0.004485	0.004629
-33	0.004184	0.007022	0.004542	0.004760
-32	0.004183	0.006912	0.004638	0.004742
-31	0.004292	0.006952	0.004697	0.004765
-30	0.004362	0.004990	0.004626	0.004825
-29	0.004343	0.007030	0.004630	0.004767
-28	0.004330	0.006821	0.004720	0.004790
-27	0.004414	0.006611	0.004683	0.004817
-26	0.004480	0.006684	0.004756	0.005034
-25	0.004578	0.006777	0.004798	0.005156
-24	0.004616	0.006809	0.004929	0.005111
-23	0.004696	0.006856	0.004903	0.005045
-22	0.004735	0.007047	0.005049	0.005079
-21	0.004841	0.007061	0.005071	0.005088
-20	0.004894	0.007044	0.005077	0.005084
-19	0.004904	0.007228	0.005120	0.005092
-18	0.005011	0.007042	0.005115	0.005137
-17	0.005053	0.007126	0.005151	0.005093
-16	0.005057	0.007174	0.005145	0.005022
-15	0.005022	0.007120	0.005172	0.005135
-14	0.005078	0.007295	0.005201	0.005212
-13	0.005172	0.006883	0.005252	0.005102
-12	0.005204	0.006861	0.005237	0.005175
-11	0.005119	0.006713	0.005083	0.005212
-10	0.005118	0.006769	0.005052	0.005177
-9	0.005147	0.006592	0.005007	0.004931
-8	0.005275	0.006606	0.004941	0.004951
-7	0.005292	0.006610	0.004915	0.005011
-6	0.005376	0.006595	0.004957	0.004918
-5	0.005290	0.006535	0.004973	0.004916
-4	0.005310	0.006525	0.004985	0.004873
-3	0.005286	0.006642	0.004957	0.004819
-2	0.005289	0.007010	0.004971	0.004996
-1	0.005293	0.006991	0.004020	0.004964

TABLE B-23. (continued)

Month	Sample 1	Sample 2	Sample 3	Sample 4
0	0.005289	0.006978	0.005025	0.004873
1	0.005361	0.006932	0.004971	0.004750
2	0.005455	0.006958	0.004993	0.004684
3	0.005463	0.007074	0.003992	0.004726
4	0.005422	0.007138	0.005032	0.004649
5	0.005460	0.007145	0.004952	0.004718
6	0.005440	0.007239	0.004901	0.004731
7	0.005383	0.007347	0.004886	0.004627
8	0.005471	0.007240	0.004887	0.004802
9	0.005624	0.007289	0.004912	0.004868
10	0.005702	0.007255	0.004990	0.004963
11	0.005739	0.007192	0.005049	0.004843
12	0.005668	0.007176	0.005143	0.004671
13	0.005687	0.007195	0.005032	0.004681
14	0.005683	0.007328	0.005055	0.004740
15	0.005677	0.007235	0.005074	0.004746
16	0.005639	0.007162	0.005118	0.004631
17	0.005647	0.007213	0.005146	0.004594
18	0.005641	0.007101	0.005288	0.004699
19	0.005581	0.007191	0.005404	0.004830
20	0.005586	0.007140	0.005400	0.004869
21	0.005578	0.007081	0.005393	0.005011
22	0.005642	0.007144	0.005346	0.004833
23	0.005694	0.007150	0.005249	0.004669
24	0.005641	0.007333	0.005214	0.004858
25	0.005649	0.007570	0.005280	0.004822
26	0.005831	0.007922	0.005306	0.004774
27	0.005919	0.007874	0.005339	0.004861
28	0.005982	0.007926	0.005452	0.005189
29	0.005958	0.007926	0.005607	0.005227
30	0.006031	0.008204	0.005625	0.005234
31	0.006014	0.008442	0.005585	0.005282
32	0.006158	0.008094	0.005736	0.005261
33	0.006202	0.008306	0.005778	0.005472
34	0.006264	0.008445	0.005768	0.005566
35	0.006282	0.008366	0.005900	0.005486
36	0.006363	0.008405	0.005927	0.005578

TABLE B-24. Summary of u statistics, Mann-Whitney Test, Samples 1 and 3.

Month	U Value	Z Value
-36	1731	0.05113
-35	1724	0.08880
-34	1731	0.05113
-33	1675	0.35253
-32	1688	0.28256
-31	1714	0.14263
-30	1750	0.05113
-29	1758	0.09418
-28	1749	0.04574
-27	1798	0.30948
-26	1803	0.33639
-25	1823	0.44403
-24	1816	0.40636
-23	1831	0.48709
-22	1804	0.34177
-21	1810	0.37406
-20	1833	0.49786
-19	1820	0.42789
-18	1883	0.76697
-17	1888	0.79388
-16	1879	0.74544
-15	1856	0.62165
-14	1854	0.61088
-13	1873	0.71315
-12	1887	0.78850
-11	1863	0.65932
-10	1889	0.79926
-9	1912	0.92306
-8	1953	1.14373
-7	1986	1.32134**
-6	1962	1.19217
-5	1932	1.03070
-4	1952	1.13835
-3	1957	1.16526
-2	1937	1.05761
-1	1907	0.89614

TABLE B-24. (continued)

Month	U Value	Z Value
0	1923	0.98226
1	1956	1.15987
2	1965	1.20832
3	1965	1.20832
4	1923	0.98226
5	1971	1.24061
6	1957	1.16526
7	1959	1.17602
8	1981	1.29443**
9	1963	1.19755
10	1946	1.10605
11	1943	1.08991
12	1924	0.98764
13	1928	1.00917
14	1931	1.02532
15	1933	1.03608
16	1903	0.87461
17	1917	0.94997
18	1874	0.71853
19	1825	0.45480
20	1847	0.57321
21	1838	0.52477
22	1871	0.70238
23	1907	0.89614
24	1872	0.70776
25	1870	0.69700
26	1905	0.88538
27	1928	1.00917
28	1905	0.88538
29	1833	0.49786
30	1850	0.58935
31	1860	0.64318
32	1869	0.69162
33	1883	0.76697
34	1939	1.06838
35	1919	0.96073
36	1955	1.15449

**Significant at an alpha value of 0.10 (Z statistic $\geq$ 1.28).

TABLE B-25. Summary of u statistics, Mann-Whitney Test, Samples 2 and 4.

Month	U Value	Level of Significance*
-36	131	.05
-35	136	.05
-34	140	.10
-33	145	.10
-32	149	.10
-31	145	.10
-30	142	.10
-29	135	.05
-28	136	.05
-27	137	.05
-26	139	.10
-25	138	.05
-24	141	.10
-23	136	.05
-22	132	.05
-21	127	.05
-20	128	.05
-19	129	.05
-18	127	.05
-17	128	.05
-16	124	.05
-15	133	.05
-14	130	.05
-13	130	.05
-12	131	.05
-11	134	.05
-10	130	.05
-9	128	.05
-8	128	.05
-7	130	.05
-6	127	.05
-5	122	.05
-4	126	.05
-3	124	.05
-2	141	.10
-1	138	.05

TABLE B-25. (continued)

Month	U Value	Level of Significance*
0	132	.05
1	129	.05
2	136	.05
3	135	.05
4	134	.05
5	133	.05
6	132	.05
7	131	.05
8	137	.05
9	139	.10
10	146	.10
11	145	.10
12	138	.05
13	136	.05
14	134	.05
15	140	.10
16	142	.10
17	140	.10
18	147	.10
19	150	.10
20	155	.15
21	165	.20
22	159	.15
23	156	.15
24	150	.10
25	147	.10
26	133	.05
27	137	.05
28	150	.10
29	153	.15
30	145	.10
31	137	.05
32	138	.05
33	138	.05
34	141	.10
35	139	.10
36	140	.10

*Levels of significance stated in increments of .05.

VITA

Charles Wayne Alderman was born in Mobile, Alabama, on October 10, 1950. He attended public schools in Mobile and Macon, Georgia. Upon graduation from Willingham High School in Macon, he enrolled at Auburn University where he received with high honors a Bachelor of Science Degree in Business Administration with a major in Accounting in December, 1971. During the following year, he was enrolled at Auburn University for a program of study leading to the Master of Business Administration Degree which was conferred in December, 1972. During this period, he was employed as a Graduate Teaching Assistant at Auburn University and an Instructor of Accounting at Tuskegee Institute. Upon completion of the Master's program, he accepted a position on the audit staff of Ernst and Ernst in the Birmingham Office. He was subsequently transferred to the Mobile Office where he attained the level of Senior Accountant before entering the Doctoral program in Accounting at The University of Tennessee. While studying for the Doctorate, he held a teaching assistantship and received a University of Tennessee Price-Waterhouse Fellowship, a University of Tennessee Non-Service Fellowship, and an Ernst and Ernst Doctoral Dissertation Grant. In addition to his academic degrees, he holds a C.P.A. from the State of Alabama. He is a member of the Alabama Society of Certified Public Accountants, the American Institute of Certified Public Accountants, Beta Alpha Psi, and Phi Kappa Phi.