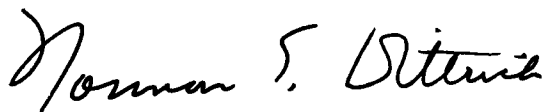


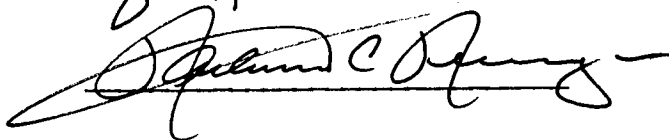
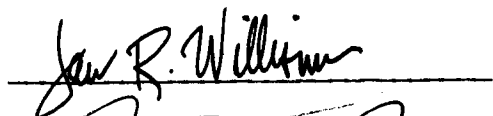
To the Graduate Council:

I am submitting herewith a dissertation written by Surasakdi Bhamornsiri entitled "An Empirical Investigation into the Association Between Accounting Risk Measures Adjusted for Capitalization of Lease Commitments and the Market Risk Measure." 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:



Vice Chancellor
Graduate Studies and Research

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AN EMPIRICAL INVESTIGATION INTO THE ASSOCIATION BETWEEN ACCOUNTING
RISK MEASURES ADJUSTED FOR CAPITALIZATION OF LEASE
COMMITMENTS AND THE MARKET RISK MEASURE

A Dissertation
Presented for the
Doctor of Business Administration
Degree
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Surasakdi Bhamornsiri

March 1979

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ABSTRACT

Since a function of external financial reporting is to aid investors in making investment decisions, alternative methods of reporting accounting information can be evaluated in terms of their impact upon these decisions. In modern portfolio theory, it is held that the market risk measure (systematic risk) is the appropriate measure of a security's or of a portfolio of securities' riskiness under a market equilibrium condition. Therefore, it can be asserted that an accounting method that improves investors' assessments or predictions of the future level of the market risk measure has increased relevance in making investment decisions.

The primary purpose of this study is to investigate the association between a set of accounting risk measures adjusted for lease capitalization and the market risk measure. Two samples of lessee firms were selected from the population of New York Stock Exchange companies. Sample 1 is made up of 58 firms who are members of three industries known to use leasing extensively whereas Sample 2 consists of 106 firms representing a subpopulation of all lessees. Each sample is further divided into two sub-samples with an equal number of firms. Based on financial data for 1973 through 1976 obtained from COMPUSTAT files and annual reports, three sets of six accounting risk measures were computed for each firm. Set 1 accounting risk measures are based on reported financial statement data. Set 2 accounting risk measures are Set 1 accounting risk measures adjusted for the effects of capitalizing

financing leases (as defined by the Securities and Exchange Commission) while Set 3 accounting risk measures reflect the effects of capitalizing all noncancelable leases. Within each sub-sample, the Spearman rank correlation coefficient between each accounting risk measure and the market risk measure (estimated through the market model and stock price data from the CRSP file) was calculated. Using Fisher's z-transformation test procedure, intra-sample comparisons were then made among the correlation coefficients to determine whether one set of accounting risk measures are more closely associated with the market risk measure than another set. Results indicate no significant differences in the association between each set of accounting risk measures and the market risk measure. Therefore, it is concluded that lease capitalization as a method of reporting lease information was not more relevant in making investment decisions than alternative methods of presentation.

As a secondary objective, this study examines the impact of the disclosure of lease information in compliance with Accounting Series Release No. 147 and Accounting Principles Board Opinion No. 31 upon the level of the market risk measure. The Student-t test was employed in testing a hypothesis that the average level of the market risk measure during a post-disclosure period (January, 1973 through December, 1977) was significantly higher than that during a pre-disclosure period (January, 1968 through December, 1972). The evidence obtained leads to a rejection of the hypothesis. Thus, the disclosure of lease information as required by the two pronouncements does not appear to have an adverse economic impact upon lessees in terms of their cost of equity capital.

Based on a contention that the requirements of Statement of Financial Accounting Standards No. 13 are essentially the same as those required by ASR 147 and APB Opinion 31, the findings of this study should be of particular interest to the accounting standard-setting bodies in their continuing efforts to improve accounting and disclosure standards for leasing transactions.

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CHAPTER I

INTRODUCTION

A major function of external financial reporting is to provide financial statement users with information useful in making investment decisions. Accounting alternatives can, therefore, be evaluated in terms of their impact upon these decisions.

In portfolio theory, the market risk measure or systematic risk is the appropriate measure of an investment's riskiness. The objectives of this study are to (1) provide empirical evidence concerning the relevance of lease capitalization in the determination of the market risk measure, and (2) investigate the impact of the disclosure of lease commitment information as required by Accounting Principles Board Opinion No. 31 and Accounting Series Release No. 147 upon the investor's assessment of the level of the market risk measure. The findings reported in this study should be of interest to all parties involved in financial reporting, particularly, the accounting standard-setting bodies and researchers in the areas of accounting and finance.

This study is an interdisciplinary research undertaking involving concepts in accounting and finance. These concepts are discussed in this chapter. Attention is also given to an elaboration of the objectives, expected contributions, and justification for this study.

I. EVOLUTION OF OFFICIAL LITERATURE ON LEASE ACCOUNTING BY LESSEES

Accounting for long-term noncancelable leases¹ has been a subject of considerable debate in the accounting and financial community for over a quarter of a century. The controversy surrounded appropriate methods of accounting and reporting for lease transactions by both lessors and lessees. More specifically, two basic issues have been widely debated:

1. What information concerning lease transactions . . . is needed by users of financial statements?
2. What portion of that information should be presented within the basic financial statements and what portion should be presented through footnotes to the financial statements? [FASB, 1976a; par. 12]

Attempts by accounting rule-making authorities to deal with the above issues have resulted in the issuance of a number of pronouncements on lease accounting. Following is a summary of official pronouncements on accounting for leases by lessees with which this study is concerned.²

¹Since a lease is a type of contract, the provisions agreed upon by the contracting parties may vary widely. In general, however, a non-cancelable lease may contain the following conditions: (1) the lessee may terminate the lease on payment of a set scale of prices plus penalty, and (2) in case of default, the lessee is liable for all future payments at once, and when paid, the lessee is to receive title to the property or, alternatively, the leased property may be sold and adjustments made by the parties for any difference between the sale price and the lessor's unrecovered cost. See Myers [1962] for further discussion of various provisions commonly found in a lease contract.

²Relating to lease accounting by lessors, two pronouncements were issued by the APB, namely APB Opinion 7 [1966] and APB Opinion 27 [1972]. These two opinions have been superseded by SFAS 13 of the FASB.

The American Institute of Certified Public Accountants (AICPA)

The first pronouncement on lease accounting by lessees was issued in 1949 by the Committee on Accounting Procedure (CAP) of the AICPA. Accounting Research Bulletin (ARB) No. 38 [AICPA, 1949] called for disclosure of leases that were in substance purchases. These principles were reaffirmed in Chapter 14 of ARB No. 43 [AICPA, 1953].

In 1964, the Accounting Principles Board (APB), for the first time, addressed the lease problem by releasing its APB Opinion 5 [APB, 1964]. In this opinion, the Board rejected a recommendation of Accounting Research Study (ARS) No. 4 [Myers, 1962] which would have required capitalization of leases that gave rise to property rights. Instead, the APB concluded that only those leases in which equity was being accrued to the lessee should be treated as an asset and, with the related liability, shown on the balance sheet. Sufficient information concerning other material noncancelable leases should be disclosed in the footnotes to the financial statements.

Accounting for leases by lessees was dealt with by the APB on one other occasion. Shortly before its termination in 1973, the Board approved its APB Opinion 31 in which it stated:

Since the adoption of [APB Opinion 5 in 1964] . . . the board has observed improvement in disclosures of lease commitments by lessees. However, some investors, credit grantors, credit rating services, and other users of financial statements have stated that the disclosures have not always provided all of the relevant information they believe to be important. [AICPA, 1973a; par. 01]

Therefore, for fiscal years ending on or after December 31, 1973, disclosures of the following specific items were required for all non-cancelable leases that were not capitalized by lessees.

1. Total rental expenses and income from subleases entering into the determination of net income for each income statement being presented.
2. The minimum rental commitments under all noncancelable leases and sublease income to be received therefrom for (a) each of the five years following the date of the latest financial statements being presented, (b) each of the next three five-year periods, and (c) the remainder as a single amount.
3. Other information necessary to assess the effect of leases on the financial position and results of operations of the firm.

In addition, the APB also encouraged a footnote disclosure of the present value of lessees' lease commitments. Such disclosure, however, was not mandatory.

The Securities and Exchange Commission (SEC)

The SEC was also interested in the lease issue but had, prior to 1973, concurred with the APB rulings in its APB Opinion 5. However, the omission of the present value disclosure requirement from APB Opinion 31 prompted an SEC intervention in the establishment of accounting standards. Shortly after the issuance of APB Opinion 31, the SEC issued its Accounting Series Release (ASR) No. 147 in which it maintained that the disclosure requirements of APB Opinion 31 would not provide sufficient information to meet the needs of investors. Specifically, the then SEC Chairman was quoted as saying:

Two weeks ago, we amended Regulation S-X to call for improved disclosure of leases by lessees. We believe that this disclosure is essential in financial statements prepared in conformity with generally accepted accounting principles. In the release accompanying the amendment, we noted specifically that we were

not prejudging the issue of proper measurement of the effect of leases--which we had referred to the Financial Accounting Standards Board--but were acting to provide adequate information to investors while the Board was considering the matter, since we did not feel that the APB opinion provided all the guidance necessary in this regard. [Southern, 1973, p. 1125]

Therefore, for filings with the SEC as well as for financial statements published subsequent to November 30, 1973, lessees were required to disclose, in addition to the APB Opinion 31 requirements, the following information items.

1. The present value of all material financing leases which had not been capitalized together with the weighted average rate or the range of rates used in computing the present value. The present value of financing lease commitments was considered by the SEC to be material if it was equal to or greater than 5 percent of the sum of long-term debt, stockholders' equity and the present value of the commitments.
2. The present value of any material income stream from subleases associated with the financing leases.
3. The effect of the financing leases on net income assuming that these leases had been capitalized and amortized using the straight line method. Only net income effects that would have been equal to or greater than 3 percent of the average net income for the most recent three years were considered material and required to be disclosed.

As defined by the SEC, a financing lease is a noncancelable lease which possesses either one of the two characteristics outlined in Figure I-1.

Criteria for SEC's Financing
Leases

- 1F. Lease terms cover 75 percent or more of the economic life of the property.
- 2F. Lease terms assure the lessor a full recovery of the fair market value . . . of the property at the inception of the lease plus a reasonable return on the use of the assets invested subject only to limited risk in the realization of the residual interest in the property and the credit risks generally associated with secured loans.

Criteria for FASB's Capital
Leases

- 1C. The lease transfers ownership of the property to the lessee by the end of the lease term.
- 2C. The lease contains a bargain purchase option.
- 3C. The lease term is equal to 75 percent or more of the estimated economic life of the lease property, except where the lease term falls within the last 25 percent of the leased property's economic life.
- 4C. The present value at the beginning of the lease term of the net minimum lease payments equals or exceeds 90 percent of the fair value of the leased property to the lessor.

FIGURE I-1. A comparison between the SEC financing lease criteria and the FASB capital lease criteria.

The Financial Accounting Standards Board (FASB)

All of the AICPA pronouncements on lease accounting have now been superseded by Statement of Financial Accounting Standards (SFAS) No. 13 [FASB, 1976a] issued by the FASB. In SFAS 13, the FASB adopted the view that "a lease that transfers substantially all of the benefits and risks incident to the ownership of property should be accounted for as the acquisition of an asset and the incurrence of an obligation by the lessee" [FASB 1976a, p. 49]. Accordingly, the FASB ruled that a lease must be capitalized if its terms contain any of the four provisions summarized in Figure I-1. A lease that meets the capitalization criteria is referred to by the FASB as a capital lease. All other leases are called operating leases.

SFAS 13 calls for capitalization and additional disclosure of other pertinent information associated with capital leases whereas only a schedule showing future minimum lease commitments and a schedule detailing current rental expense are required for operating leases. Lessees, however, need not adopt these new rules immediately. Because of the four-year transition period incorporated into SFAS 13, these new rulings will not become retroactively effective on existing leases until lessees issue their financial statements for calendar or fiscal years beginning after December 31, 1980. In the meantime, lessees are required to disclose the effects of complying with SFAS 13 in the footnotes to their financial statements.

Since the issuance of SFAS 13 in 1976, the FASB has released two other statements [FASB, 1977a and FASB, 1978a] to clarify or to amend its position in SFAS 13. The FASB has also published two interpretations of

SFAS 13 [FASB, 1977b, and FASB 1978b]. Currently, the Board is considering an amendment to SFAS 13 concerning the use of interest rate implicit in the lease in computing the present value of the lease for the purpose of determining whether or not the lease should be classified as a capital lease [Deloitte Haskins and Sells, 1978].

A Comparison Between SEC Financing Leases and FASB Capital Leases

A comparison in Figure I-1 between the criteria for classifying a lease as a financing lease and those for classifying a lease as a capital lease reveals that the two types of leases are very similar, although not identical. Criterion 3C for capital leases is identical to Criterion 1F for financing leases, except the former does not apply to leases on assets which have been used for over 75 percent of their economic lives. Criteria 1C, 2C, and 4C, on the other hand, imply the existence of lease terms which assure the lessor of a reasonable return plus the original cost of the lessor's investment which is also a condition inherent in Criterion 2F.

Based on the foregoing comparison between the SEC's financing leases and the FASB's capital leases, it can reasonably be argued that the two categories of leases are essentially the same. Consequently, it can be further asserted that requiring balance sheet presentation of capital leases represents little more than a relocation of the present values of financing leases now being disclosed in the footnotes to the financial statements to the bodies of the financial statements. Thus it is not likely that any new information concerning lease commitments of lessees will be provided in the financial statements under the new FASB rules. In fact, SFAS 13 actually requires less disclosure of information

concerning future minimum lease commitments than had existed under APB Opinion 31 and ASR 147; i.e., the minimum lease commitments for the three five-year periods and any remaining commitments due after these periods are to be reported as a single amount.

The assertion that a capital lease is essentially the same as a financing lease is further supported by the recent issuance of ASR 225 [SEC, 1977] by the SEC. ASR 225 supersedes ASR 147 and requires retro-active application of SFAS 13 on existing leases for financial statements relating to fiscal years ending after December 24, 1978, that are filed with the SEC. In issuing its ASR 225 the SEC argued that lessees have already had the data necessary for the computation of capital leases; i.e., lessees can use the same set of data they have been using to calculate the present value of financing leases in computing their capital leases. Based on this argument, the SEC ruled that the four-year transition period permitted by the FASB was not necessary.

Summary

In this section the development of accounting principles on lease accounting by lessees was chronologically summarized. Although all of the accounting authorities mentioned agreed that disclosures of lease information are useful to investors, there appear to be distinct disagreements among them as to the specific information items lessees should be required to disclose and how these items should be disclosed. Figure I-2 presents a comparison of the basic lease disclosure requirements and methods for presenting the lease information under the four most recent official pronouncements on lease accounting. An accounting principle on lease accounting by lessees that will become fully

<u>Pronouncement</u>	<u>Lease information required</u>	<u>Method of reporting</u>	<u>Effective date</u>
<u>APB Opinion 31</u> (superseded by <u>SFAS 13</u>)	A schedule showing future minimum commitments on all noncancelable leases	Footnote disclosure	For financial statements for fiscal periods ending on or after December 31, 1973
<u>ASR 147</u> (superseded by <u>ASR 225</u>)	<u>APB Opinion 31</u> requirements plus the present value and other related information items on financing leases	Footnote disclosure	For financial statements filed with the SEC subsequent to November 30, 1973
<u>SFAS 13</u>	All noncancelable leases categorized into capital and operating leases	Balance sheet presentation for capital leases and footnote disclosure for operating leases	Retroactive on all leases reported in financial statements for calendar or fiscal years beginning after December 31, 1980
<u>ASR 225</u>	Same as <u>SFAS 13</u>	Same as <u>SFAS 13</u>	For financial statements filed with the SEC for fiscal years ending after December 24, 1978

FIGURE I-2. A comparison of lease disclosure requirements of the last four major pronouncements on lease accounting by lessees.

NOTE: Although the requirements of an ASR are applicable only to financial statements filed with the SEC, it was found during the course of this investigation that the same set of lease information appeared on both financial statements issued to the public and those filed with the 10-K reports.

effective in the near future is the capitalization of capital (financing) leases. Whether this accounting principle will have any significant effect on investment decisions is an aspect of this study.

II. CONCEPTS OF RISK AND RISK MEASURES

The concept of risk associated with an investment is derived from modern portfolio theory which has been extensively discussed in finance literature. Previous studies have reported significant degrees of association between two types of risk measurement: the market risk measure (arising from modern portfolio theory) and certain accounting risk measures (financial ratios). This section introduces the concept of a security's riskiness and discusses the two types of risk measurement as well as their relationships.

Concept of Risk

According to Van Horne [1974], the riskiness of an investment proposal is defined as "the variability of its possible returns" (p. 134). Therefore, the total riskiness of a security can be measured in terms of the variance associated with the security's expected return. Thus, Treasury bills maturing in one year are said to be risk-free (if held for one year), because their returns can be precisely predicted. In contrast, the return from a corporation's security is subject to varying degrees of uncertainty relating to the stream of the corporation's earnings. This uncertainty is dependent upon events such as the movements in the economy in general, economic factors associated with the firm in particular, technological changes, competition, labor conditions, and changes in consumer behavior [Van Horne, 1974]. Since

these events and their potential effect upon the firm's results of operations cannot be accurately forecast, it follows that the return from the firm's security cannot be precisely projected.

In financial theory, it is commonly assumed that the probability distribution of the expected return from a security is normal and that the probability associated with each return value can be estimated. Based on this assumption, the variance of the return distribution represents the measure of the security's riskiness. Considered alone, a security with a greater variance is riskier than another with less variance.

Concepts of Risk Measures

Accounting risk measures. Financial ratio analysis has traditionally played an important role in security analysis. This is evident by the inclusion of one or more chapters on financial ratio analysis in most finance and accounting texts. Moreover, important financial ratios are published periodically by financial services such as Robert Morris Associates and Dun and Bradstreet.

A common use of financial ratios is as a basis for comparing the risk-return characteristics associated with the firm's financial position and results of operations. Previous studies dealing with the usefulness of financial ratios in making investment decisions have identified several accounting ratios as measures of a security's riskiness. These accounting risk measures include dividend payout, leverage, liquidity, asset size, asset growth, variability of earnings and covariability of earnings. Beaver, Kettler, and Scholes (BKS)[1970] examined these accounting risk measures computed from reported accounting data.

Derstine [1973] and Derstine and Huefner [1974] adjusted the accounting risk measures to reflect the effect of LIFO-FIFO inventory pricing methods whereas Eskew [1975] compared the accounting risk measures based on the full costing method to those based on the successful efforts costing method used in the petroleum industry to record exploration expenditures. In this study, the accounting risk measures based on reported accounting data are adjusted to reflect the impact of lease capitalization.

The market risk measure. According to portfolio theory, the total riskiness of a security is divided into two separate risk components systematic and unsystematic. An unsystematic risk is unique to a particular security and can be eliminated through diversification. Systematic risk, on the other hand, represents the covariability of the return from a security with other securities in the same portfolio. This type of risk cannot be diversified away and is considered the appropriate measure of a security's riskiness.

Sharpe [1964] and others have developed the capital asset pricing model, which shows that in market equilibrium a security's riskiness is measured by its systematic risk, defined as the covariability of the security's return with the return from the "market portfolio." This systematic risk is often referred to in the literature as the market risk measure (which is the term that will be used throughout this study). The market risk measure is a measure of the sensitivity of the return from a security to the return from the market portfolio in market equilibrium. It is regarded as the relevant measure of a security's riskiness in the portfolio context.

Empirical Relationship Between Accounting and the Market Risk Measures

Although the accounting risk measures are generated from accounting data whereas the market risk measure is estimated from stock price data, BKS argued that the two types of risk measures are implicitly related. Specifically, the accounting risk measures capture the total riskiness (both systematic and unsystematic risk components) of a security. Since the correlation between the systematic risk and unsystematic risk components is high [BKS, 1970], the accounting risk measures can be viewed as surrogates for the systematic (market) risk measure as well.

Given the popularity of financial ratio analysis as a security analysis tool and the significance of the market risk measure in making investment decisions, a number of studies have been undertaken to empirically investigate the "contemporaneous association" [BKS, 1970] between the accounting risk measures produced by different accounting alternatives and the market risk measure. The usefulness of these alternatives is judged according to their influence upon the level of the association between the accounting risk measures and the market risk measure. As Derstine [1973] pointed out, "The criterion for choosing between alternative accounting methods thus becomes--the higher the association between the accounting risk measurement and the market risk measurement--the more preferable the alternative" (p. 2). This view is shared by Eskew [1975] who stated:

If the accounting data for one of the accounting methods . . . can be shown to be more highly associated with the market risk measure, then that method would appear to produce more useful information for prediction of future values of the market risk measure, and therefore, is more preferable. (p. 321)

In this study, the association criterion suggested above is used to evaluate the relevance of lease capitalization in making investment decisions.

Summary

Portfolio theory asserts that the market risk measure is the relevant measure of an investment's riskiness. Based on this assertion studies have been undertaken to investigate the association between the market risk measure and accounting risk measures generated by different accounting alternatives. An accounting method which produces accounting risk measures that are most closely associated with the market risk measure is considered most useful in making investment decisions. This criterion and empirical results reported in earlier studies concerning the association between these two types of risk measurement provide a methodological foundation for this research effort.

III. OBJECTIVES OF THE STUDY

This study has two objectives. These objectives are elaborated upon in this section.

(1) Relevance of lease capitalization. The first objective of this study is to investigate the relevance of lease capitalization as an accounting alternative for reporting lease information.³ The basic

³Two important points must be made here concerning this objective of the study. First, a distinction must be made between the terms "lease capitalization" and "lease information." Lease capitalization refers to a method of presenting lease information in the bodies of the financial statements. Second, this first objective has been restated. The original objective was stated in terms of lease information with an expectation that lease capitalization would have a significant impact

research question underlying this objective is whether or not lease capitalization will produce a set of financial statement data that would have a significant influence on investment decisions. More specifically the study is intended to provide empirical evidence concerning the potential impact on the level of association between accounting and the market risk measures of (a) capitalizing only financing leases, and (b) capitalizing all noncancelable leases. As in previous studies, the association criterion is used in this study in judging the relevance of lease capitalization. Lease capitalization is considered relevant in making investment decisions only if it produces a set of accounting risk measures that are significantly and consistently more closely associated with the market risk measure than accounting risk measures computed from reported accounting data. Figure I-3 depicts the research concept that underlies this study's first objective.

(2) Economic impact of the disclosure of lease information. The second objective of this study is to determine the impact of the disclosure of lease information on investment decisions. The issue being addressed here is whether the disclosure of lease information in compliance with APB Opinion 31 and ASR 147 had an adverse economic consequence on the lessee. Since a higher level of the market risk measure

upon the ranking of the accounting risk measures and that either the adjusted or unadjusted (for lease capitalization) accounting risk measures would exhibit a higher level of association with the market risk measure than the other. However, as data were collected and analyzed it became apparent that lease capitalization would not have a discernible effect on the ranking of the accounting risk measures. Therefore, due to the limitation of the statistical method used (a ranking procedure) and the nature of the empirical data, the results obtained in this study cannot be interpreted in terms of lease information.

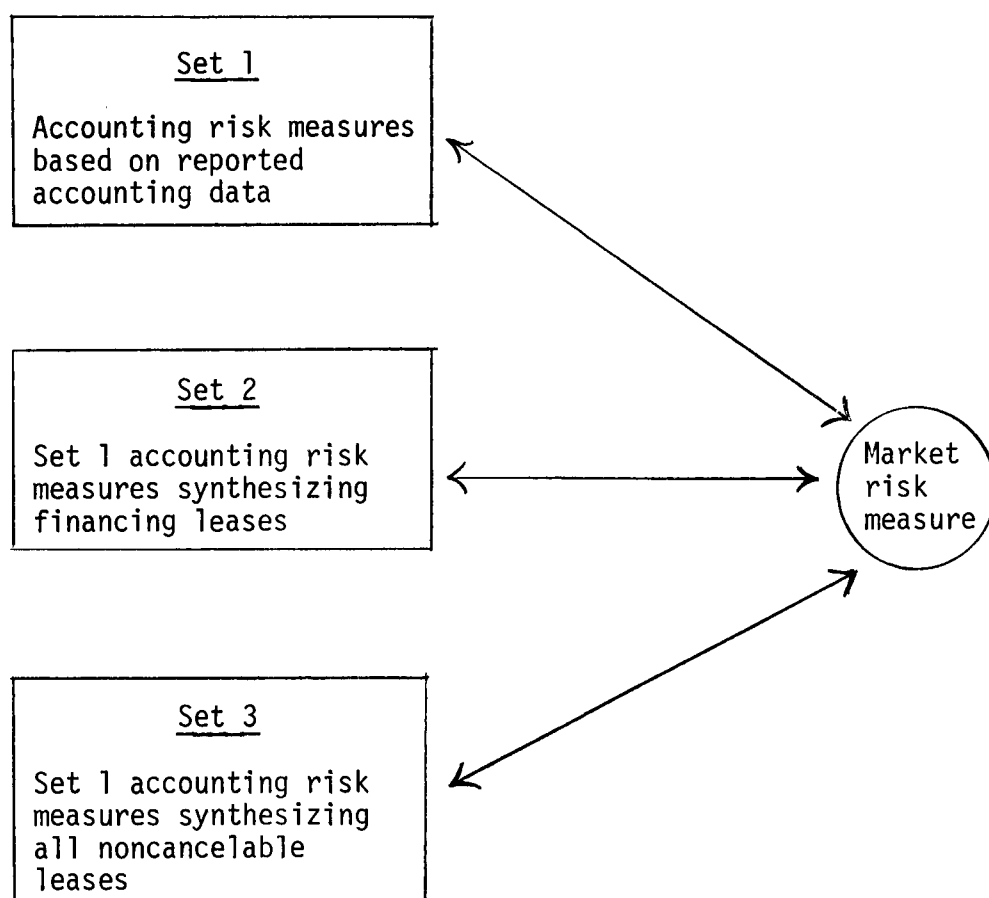


FIGURE I-3. Research concept--relevance of lease capitalization in the determination of the market risk measure.

means higher cost of equity capital, an observed significant increase in the level of the market risk measure of the lessee's common stock from a pre- to a post-disclosure period would indicate that the disclosure of lease information had an adverse economic impact on the lessee. The research concept relating to the second objective of this study is diagrammed in Figure I-4.

IV. METHODOLOGICAL OVERVIEW

This section outlines the research methodologies used to accomplish the objectives of the study. Detailed discussions of these methodologies are presented in Chapter III.

(1) Relevance of lease capitalization. To determine the relevance of lease capitalization in making investment decisions, the following general hypotheses are formulated:

$H_{0(I-1)}$: The capitalization of financing leases is relevant in making investment decisions.

$H_{0(I-2)}$: The capitalization of all noncancelable leases is relevant in making investment decisions.

$H_{0(I-3)}$: The capitalization of financing leases is not as relevant in making investment decisions as the capitalization of all noncancelable leases.

To test these hypotheses, two samples of lessee firms are drawn from the population of firms listed on the New York Stock Exchange (NYSE). The first sample (Sample 1) consists of 58 firms in three industries known to use leases extensively. These industries include the air transportation industry, the retail department stores industry, and

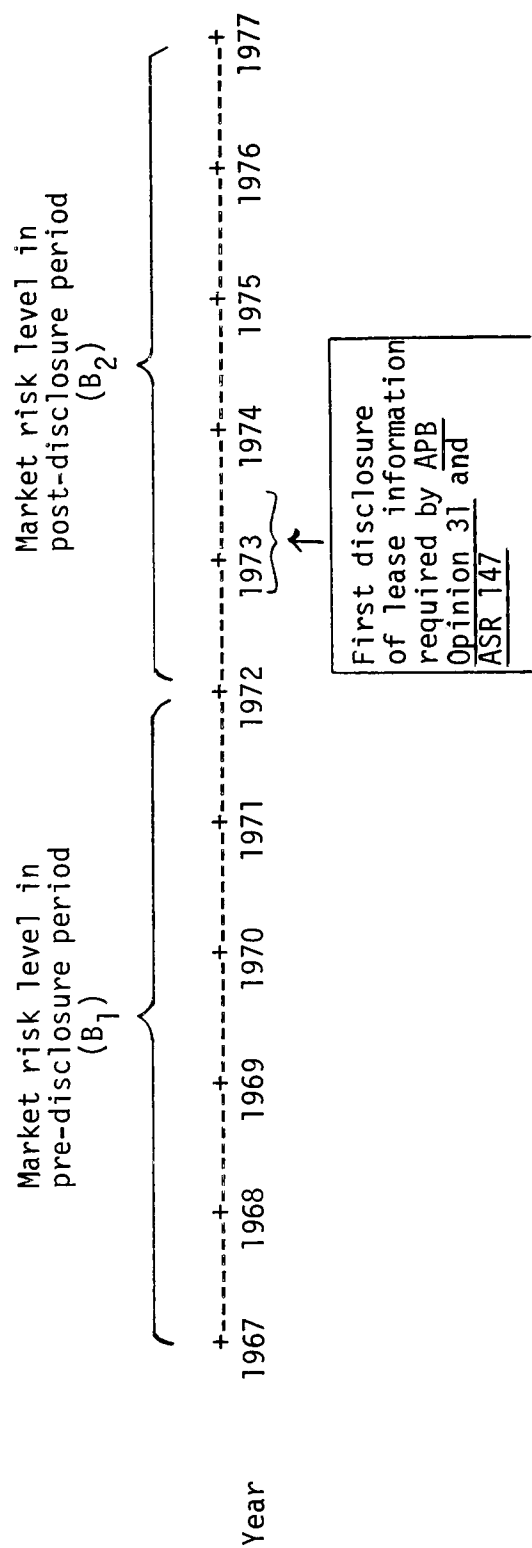


FIGURE I-4. Research concept--impact of the disclosure of lease information upon the investors' perception of the level of the market risk level.

the retail grocery stores industry. The second sample (Sample 2) is made up of 106 firms drawn from 49 industries to represent a total of 245 NYSE firms that reported the present value of their leases in their 1973 through 1976 financial statements. Thus Sample 1 represents firms that are likely to be most affected by lease capitalization while Sample 2 represents lessees in general.

Based on accounting data for 1973 through 1976 obtained from the COMPUSTAT tape,⁴ financial statements and 10-K reports three sets of six accounting risk measures are computed for each sample firm. Set 1 accounting risk measures are computed from the reported accounting data. Set 2 accounting risk measures are based on the reported data adjusted for the effect of capitalizing financing leases. Set 3 accounting risk measures are based on the reported data adjusted for the effect of capitalizing all noncancelable leases.

The market risk measure for each firm is estimated through the market model using stock price data for a 60-month period from January, 1973 through December, 1977. The stock price data are obtained from the CRSP file.⁵ Using Spearman rank correlation coefficients (r_s), comparisons of the degrees of association between each accounting risk measure and the market risk measure are made to determine whether lease capitalization is relevant in making investment decisions. More

⁴The COMPUSTAT Annual Industrial tape is used in this study. The tape contains detailed financial data as well as monthly security prices and is maintained by Investors Management Services, Denver, Colorado.

⁵The Center for Research in Security Prices file contains stock price data of New York Stock Exchange firms. The CRSP file is maintained by the Graduate School of Business at the University of Chicago.

specifically, each sample is divided into two equal sub-samples. This procedure produces two independent groups within each sample on which a statistical test of significance can be applied. Within each sample and with one sub-sample acting as a control group while the other as an experimental group, the following comparisons are made.

1. To test Hypothesis $H_{0(I-1)}$, r_s between each of the Set 2 accounting risk measures and the market risk measure in the experimental group is compared with r_s between the corresponding Set 1 accounting risk measure and the market risk measure in the control group.
2. To test Hypothesis $H_{0(I-2)}$, r_s between each of the Set 3 accounting risk measures and the market risk measure in the experimental group is compared with r_s between the corresponding Set 1 accounting risk measure and the market risk measure in the control group.
3. To test Hypothesis $H_{0(I-3)}$, r_s between each of the Set 2 accounting risk measures and the market risk measure in the experimental group is compared with r_s between the corresponding Set 3 accounting risk measure and the market risk measure in the control group.

R. A. Fisher's [1930] test of significance between two observed correlation coefficients is used to determine whether r_s 's in each of the comparisons specified above are significantly different. Failure to detect significant differences resulting from these comparisons would lead to a conclusion that lease capitalization is not relevant in making investment decisions.

(2) Impact of lease information disclosure. The underlying question to be examined here is whether or not the significant increase in the amount of lease information required by APB Opinion 31 and ASR 147 had any discernible effect upon the investor's ex post assessment of the level of the market risk measure of the lessee's securities. Accordingly, the following hypothesis is formulated.

$H_0(II)$: The disclosure of lease information in compliance with APB Opinion 31 and ASR 147 did affect the investor's assessment of the level of the market risk measure.

To test this hypothesis, a pre-disclosure market risk measure is estimated for each firm using stock price data, where available, for 60 months from January, 1968 to December, 1972, inclusive. The Student t-test of significant difference between two means is employed to determine whether there has been a significant increase in the level of the market risk measure within each sample from the pre- to post-disclosure period (January, 1973 through December, 1977). Rejection of the hypothesis would indicate that the disclosure of lease commitment information did not have a permanent adverse effect upon the lessee.⁶

⁶The question being addressed here is not whether the market "reacted" to the disclosure of lease information. Other studies [Ro, 1977a; Ro, 1977b; and May, Harkins and Rice, 1978] have determined, by examining the unsystematic risk component or cumulative residuals, that the market reacted to certain information items disclosed by lessees. The interest in this study, however, is in the impact of the disclosure of lease information upon the level of the systematic risk. By comparing the pre-disclosure to the post-disclosure level of the systematic risk this study intends to determine whether the disclosure had a lasting effect on the systematic risk component.

V. JUSTIFICATION FOR THE STUDY

Considering the extent of the debate over lease accounting in the literature, empirical research into the impact of lease information on investment decisions is relatively scarce. One reason for a lack of empirical studies on this subject may have been due to the unavailability of lease data from public sources prior to the issuance of APB Opinion 31 and ASR 147. Studies by Nelson [1962, 1963], Malandro [1965], Gritta [1974], and Elam [1975] provided evidence supporting this statement.

With the publication of APB Opinion 31 and ASR 147 the amount of lease information included in the financial statements increased significantly. This set of lease information provided a data base for empirical studies concerning leases that to date has not been exhaustively explored.

A question may be raised as to the justification for conducting research dealing with the now superseded APB Opinion 31 and ASR 147. As extensively discussed earlier in this chapter, the present accounting principles for accounting for leases by lessees represent no significant changes from those that had existed since the issuance of APB Opinion 31 and ASR 147. Thus, it is contended that this study deals with the lease information required under the current generally accepted accounting principles.

VI. EXPECTED CONTRIBUTIONS OF THE STUDY

The controversy over lease capitalization has been debated in the accounting and finance literature for over a quarter of a century.

At issue is whether or not lease obligations should be considered a form of debt and treated as such. Little attention, however, has been given to the question as to whether or not lease capitalization would be relevant in making investment decisions. The findings of this study will provide information related to this question.

As can be noted from the discussion of the development of accounting principles on leases by lessees presented earlier in this chapter, the SEC and the FASB appear to have concluded that the capitalization of capital (financing) leases is the appropriate method for reporting this type of lease commitments. Some authors (e.g., Huefner [1970], Wyatt [1974], and Hendriksen [1977]) would not agree with this conclusion. These authors have argued that all noncancelable leases, not just financing leases, should be capitalized. Results obtained from this study will provide further insight into this controversy.

Another issue regarding accounting for leases that has been vigorously debated is the potential economic impact of reporting leases on the lessee's balance sheet. Some have expressed fear that treating a lease as an asset and liability would reduce the borrowing capacity of the firm and would increase its cost of capital, thus producing an adverse effect on individual lessees and on the economy as a whole. Others, however, contend that investors and creditors had been made aware of the existence of the lessee's "off-the-balance-sheet" financing activity since the issuance of APB Opinion 31 and ASR 147 became effective in 1973. Therefore, it is contended, transferring leases from the footnotes to the bodies of the financial statements as required by SFAS 13 would not affect the lessee economically. Instead, if the

disclosure of lease information had any impact on the lessee, this impact would have already occurred when the lessee first disclosed the lease information as required by APB Opinion 31 and ASR 147. Results obtained in this study are expected to contribute to the resolution of this controversy.

In sum, the findings of this study will have significant implications for the justification of SFAS 13 and will provide additional evidence regarding the potential economic impact of accounting principles, a subject in which the FASB is interested.

VII. ORGANIZATION OF THE STUDY

The remainder of this study is organized as follows. Chapter II presents a review of the literature relating to the objectives of this research effort. Chapter III is devoted to an elaboration of the research methodology used while Chapter IV contains the analyses of results. Chapter V, the final chapter, summarizes the contents of the study and discusses some important conclusions drawn from the results obtained.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to present a review of the literature relating to the objectives of the study. This literature review encompasses concepts and empirical studies from both accounting and finance disciplines. The chapter is divided into three major sections. Section I deals with the literature relating to the first objective of the study; i.e., to examine the relevance of lease capitalization in the assessment of the market risk measure. Specifically, this section includes (a) a discussion of the development and significance of the market risk measure, (b) a discussion of a theoretical relationship between a firm's capital structure and the market risk measure of its security and the implications of this relationship for this research undertaking, and (c) a summary of three studies on the association between accounting risk measures and the market risk measure.

In section II, the literature relating to the second objective of the study (i.e., to examine the impact of the disclosure of lease information upon the level of the market risk measure) is summarized. This includes (a) a discussion of the controversy over whether or not lease capitalization would bring about any adverse economic consequence to the lessee, and (b) a review of four studies that have investigated the impact of the disclosure of lease information upon the lessee's stock prices.

Section III is devoted to summarizing the contents of the first two sections as well as to discussing the implications of the literature reviewed for the objectives of this study.

I. LITERATURE ON THE ASSOCIATION BETWEEN ACCOUNTING RISK MEASURES AND THE MARKET RISK MEASURE

The Market Risk Measure¹

Portfolio theory. Recent developments in portfolio theory have introduced an investment analysis technique based on the risk and return characteristics of a security and of a portfolio of securities. A pioneering work by Markowitz [1952] described a mean-variance model whereby the total riskiness of a security is divided into a systematic risk component and an unsystematic risk component. The unsystematic risk represents the riskiness unique to an individual security and can be eliminated through diversification. The systematic risk, on the other hand, represents the sensitivity of the return from a security to the returns from other securities in the same portfolio. This risk component cannot be eliminated and is considered the appropriate measure of a security's riskiness in the portfolio context.

Sharpe [1963] developed the diagonal model which assumes a linear relationship between security returns and the return from a market

¹The discussion of portfolio theory in this section is intended only as an introduction into the vast field of investment analysis. The concepts of risk and return associated with portfolio theory have been discussed extensively in the literature and will not be repeated here. For a full treatment of this subject, see Beaver [1972] and Jensen [1972].

portfolio. The diagonal model also distinguishes between the systematic and unsystematic risk components with similar characteristics and properties as specified under the mean-variance model.

The concept of the market risk measure. Building upon the mean-variance and the diagonal model, Sharpe [1964], Lintner [1965a, 1965b], and Mossin [1966] developed the capital asset pricing model (CAPM) which prescribes the relationship between security returns and risk when the capital market is in equilibrium. The CAPM assumes the following:

1. All investors have the same one-period time horizon (e.g., a week, a month, or a year). The type of decisions to be made by investors involves a trade-off between current consumption and terminal wealth at the end of the period.
2. Investors are capable of calculating all possible returns from a security and their respective probabilities of occurrence. Additionally, it is assumed that:
 - (a) Investors are risk-averse, expected utility maximizers.
 - (b) The probability distribution of security returns is normal.
3. Investors have homogeneous expectations regarding the expected returns and risks of securities.
4. The capital market is perfect; i.e., all securities are infinitely divisible, there are no income tax differentials or transactions costs, and there exists a risk-free rate of interest at which investors can borrow or lend.

From these assumptions, the CAPM asserts that, in equilibrium, securities will be priced so that:

$$E(R_{jt}) = R_f + [E(R_{mt}) - R_f] \frac{\text{cov}(R_{jt}, R_{mt})}{\sigma^2(R_{mt})} \quad (2-1)$$

where

R_{jt} = return on security j in period t , defined as

$$(P_{j(t-1)} - P_{jt} + D_{jt})/P_{jt}.$$

P_{jt} = market value of security j at time t .

D_{jt} = dividend paid on security j at time t .

R_f = risk-free rate of interest.

R_{mt} = return on the market portfolio in period t .

cov = covariance.

σ^2 = variance.

Equation (2-1) above can also be written in the following form:

$$E(R_{jt}) = R_f + B_j [E(R_{mt}) - R_f] \quad (2-2)$$

where

$$B_j = \frac{\text{cov}(R_{jt}, R_{mt})}{\sigma^2(R_{mt})}.$$

The term B_j is the market risk measure. It is also referred to as the systematic risk, the relative risk, and the beta coefficient. B_j measures the volatility of the security's rate of return relative to changes in the market return.

Significance of the market risk measure. The market risk

measure derives its significance from the implications of the CAPM. Note that in Equation (2-2) above, B_j is the only variable that is specific to security j . R_f and $E(R_{mt})$ are the same for all securities in the market. Thus, in market equilibrium, the expected returns differ among securities only in accordance with the differences in the values of their market risk measures. More specifically, the higher the value of the market risk measure, the greater the return from the security is expected by investors and the higher the cost of equity capital the firm has to pay. Therefore, any event that causes an increase in the level of the market risk measure without resulting commensurate increase in expected returns produces an adverse economic consequence to the firm.

The foregoing discussion leads to two important assertions relating to the objectives of this study. First, any accounting method or information item that is relevant in the assessment of the market risk measure is useful to investors. Secondly, any accounting information item that affects the assessment of the market risk measure directly affects the allocation of capital supply within the economy. By examining the relevance of lease capitalization in the determination of the market risk measure and the impact of the lease information disclosure upon the level of the market risk measure, this study evaluates the lease controversy on the basis of these two assertions.

Relationship Between Capital Structure and the Market Risk Measure

A great deal of controversy over the impact of a firm's capital structure upon its security prices can be found in the finance literature. The controversy evolves around a theory developed by Modigliani

and Miller [1958] (hereafter, MM theory). MM theory asserts that there is a linear relationship between a firm's debt-to-equity ratio and the investor's expected return on the firm's common stock. This relationship can be expressed algebraically as

$$R_j^e = p_u + (p_u - i)[D_j/S_j] \quad (2-3)$$

where

R_j^e = return expected from security j by stockholders.

p_u = expected return from the securities of an equivalent unlevered (debtless) firm in the same risk class as firm j.

i = the interest rate on debt.

D_j = the market value of firm j's debt.

S_j = the market value of firm j's common stockholders' equity.

Equation (2-3) can be viewed in terms of risk and return associated with firm j's security as described under the CAPM (see Equation (202)). In Equation (2-3), however, the debt-to-equity ratio, D_j/S_j , represents a measure of the security's riskiness as opposed to the market risk measure, B_j , in Equation (2-2). According to Hamada [1969, 1972] and Rubinstein [1973] B_j can be expressed as a function of D_j/S_j as follows:

$$B_u = B_j (S_j/S_u) \quad (2-4)$$

where

B_u = the market risk measure of an equivalent unlevered firm in the same risk class as security j.

S_u = the market value of common stockholders' equity of an unlevered firm in the same risk class as firm j .

Since, by definition, $S_u = S_j + D_j$, Equation (2-4) can be rewritten as

$$B_j = B_u (1 + D_j/S_j). \quad (2-5)$$

Equation (2-5) is of particular significance to this study because it establishes an a priori relationship between the debt-to-equity ratio of a firm and the market risk measure of its common stock. If it is assumed that lease commitments are a form of debt, then the equation can be modified to include capitalized value of lease commitments as follows:

$$B_j = B_u [1 + (D_j' + L_j)/S_j] \quad (2-6)$$

where

D_j' = the market value of debt other than leases.

L_j = capitalized value of leases.

Based on the relationship shown in Equation (2-6), therefore, lease commitments should be directly related to the market risk measure.

However, it must be noted that the relationship in Equation (2-6) will hold only if both of the following conditions are met: (a) MM theory is valid, and (2) investors perceive lease obligations to be equivalent to debt obligations. These two conditions are further examined below.

The validity of MM theory. MM theory is derived from a set of strict assumptions, the most controversial of which are (1) individuals and firms can borrow at the same rate of interest, and (2) there is no bankruptcy. Stiglitz [1969] showed that the theory may still be valid

even when there are limitations on individual borrowing. However, he pointed out that the validity of MM theory is questionable when there is a possibility of bankruptcy involved.

A number of empirical studies have been undertaken to provide evidence regarding MM theory. These studies, unfortunately, reported contradicting results. Studies by Modigliani and Miller [1958], Miller and Modigliani [1966], and Hamada [1972] are among those that found evidence in favor of the theory. On the other hand, studies by Fisher [1959], Barges [1962], Wipperfurth [1966], Brigham and Gordon [1968], Robichek et al. [1973], Melynk [1970], Schwartz and Aronson [1967], Scott [1972], and Scott and Martin [1974] failed to provide evidence in support of the theory. Thus, the question as to the validity of MM theory is still an unresolved issue.

The perceived equivalency of leases and debt. Whether or not investors view long-term noncancelable leases as a form of debt is also an unresolved issue. Rental payments on noncancelable leases represent fixed charges as do debt payments. These two types of financial instrument differ, however, with regard to bankruptcy claims. The federal bankruptcy law generally limits a bankrupt firm's maximum liabilities under a lease to one year's rent in the event of straight bankruptcy and a three years' rent in reorganization cases. These rules apply only if the trustee decides to terminate the lease [Gant, 1959; Scott, 1977]. From the stockholder's point of view, therefore, a lease can be more advantageous than debt because lease claims are normally substantially less than those represented by debt obligations [Gant, 1959]. Thus, when Vancil and Anthony [1959] surveyed 512 financial institutions they found

that "most financial analysts say [a long-term noncancelable lease] is [equivalent to debt], but only a minority act that way" (p. 130).

Vancil and Anthony further reported that:

Less than half the insurance companies, less than one-fourth of commercial banks, and practically no mutual funds, investment bankers or fund trustees actually do make use of formal analytical techniques equating lease payments to debt, on a routine basis. (p. 130)

The above discussion raises another question concerning the relationship shown in Equation (2-6). If the lease commitment (L_j) is not perceived as being equivalent to debt (D_j), then Equation (2-6) may not represent the empirical relationship between lease commitments and the market risk measure. The findings regarding the association between accounting risk measures which include capitalized lease commitments and the market risk measure in this study may provide further insight into this issue. More specifically, if it is found that the accounting risk measures adjusted for the effect of lease capitalization are more closely associated with the market risk measure than the corresponding accounting risk measures based on reported accounting data, it may be concluded that investors regard lease commitments as a form of debt and consider these commitments in the assessment of a security's riskiness.

Previous Empirical Research On the Association Between Accounting Risk Measures and the Market Risk Measure

A conclusion reached earlier in this chapter that the market risk measure is the appropriate measure of a security's riskiness has a significant implication for accounting research. Based on the importance attached to the determination of the market risk measure, it can be

asserted that accounting methods can be evaluated in terms of its relevance in the determination of this factor.

A methodology used by a number of researchers to evaluate the relevance of an accounting method in the determination of the market risk measure is the examination of what Beaver, Kettler, and Scholes [1970] termed "contemporaneous association" between certain accounting variables (ratios) containing that information item and the market risk measure. Presented below is a review of three studies which have investigated the contemporaneous association between accounting risk measures and the market risk measure. To the knowledge of this author, these are the only studies using the same methodology as in this study.

(1) Beaver, Kettler, and Scholes (BKS) [1970]. Observing that accounting variables have traditionally been recognized as a means by which a firm's total risk is evaluated and that the market risk measure represents a risk component of the firm's securities, BKS undertook a pioneering work to investigate the relationship between the two types of risk measures. From accounting and stock price data for the period 1947-1957, BKS computed seven accounting risk measures for 307 firms and the market risk measures for their common stocks. The seven accounting risk measure were: average payout, average leverage, average asset growth, average asset size, average liquidity, earnings variability, and covariability of accounting earnings (accounting beta). Each accounting risk measure was then correlated against the market risk measure through the Spearman rank correlation and the Pearson product-moment correlation procedures.

Through the Spearman rank correlation procedure, BKS found that there exist statistically significant associations between the market risk measure and four of the seven accounting variables. These four accounting variables were: average payout, average leverage, earnings variability, and accounting beta. BKS further reported that the accounting risk measures are predictive of future market risk level; i.e., the accounting risk measures computed over the period 1947-1956 can be used to predict the market risk measure for the period 1957-1966.

(2) Derstine [1973] and Derstine and Huefner [1974]. The alternative use of the LIFO and FIFO inventory pricing methods can generate a different set of accounting numbers for two identical firms. In an inflationary period the firm that uses LIFO will report a smaller amount of inventory and a lesser amount of net income than its FIFO counterpart. Two related studies, Derstine [1973] and Derstine and Huefner [1974], examined the comparability between selected accounting risk measures computed from LIFO-based and FIFO-based data. The researchers then investigated the association between these accounting risk measures and the market risk measure.

The two studies were divided into two stages. In the first stage, twenty-four firms which reported both LIFO and FIFO inventory values for at least one year between 1951 and 1960 were identified through Accounting Trends and Techniques. The reported accounting data of these firms were adjusted so that each firm had two sets of accounting numbers, one was based on LIFO and the other on FIFO. The Spearman rank correlation procedure was used to compare the two sets of data according to the rankings of four accounting risk measures (these variables were similar

to the ones BKS found to be significantly associated with the market risk measure). The results in this first stage indicated that the LIFO and FIFO alternatives did not have any significant effect upon the rankings (comparability) of the firms' accounting risk measures. More specifically, the firms that ranked high on the LIFO variables also ranked high on the FIFO variables, and vice versa.

In the second stage of the studies, the rankings of accounting variables of (a) forty-five LIFO firms, (b) forty-five FIFO firms, and (c) all ninety firms combined, and the ranking of the market risk measures of these firms' common stocks were compared. Based on the results from the first stage of the studies, the researchers hypothesized that there would be no significant differences between the degrees of association between the market risk measure and the LIFO, FIFO, and combined LIFO-FIFO rankings. This hypothesis could not be rejected.

(3) Eskew [1975]. Two alternative accounting methods are used in the extractive petroleum industry to record exploration expenditures. The successful efforts costing method is characterized by the capitalization of only exploration expenditures associated with productive wells and the expensing of all other exploration costs. The full costing method, on the other hand, requires that all exploration expenditures be capitalized. Consequently, these two methods produce two different sets of accounting numbers, ceteris paribus. More specifically, for two firms with the same underlying economic conditions, the one that uses the full costing method will generally show a higher net income and a greater amount of assets on its financial statements than does the successful efforts costing firm.

Eskew selected two samples of firms in the petroleum industry; one used the full costing method and the other used the successful efforts costing method. The firms in the two samples were matched in such a way that any material differences in their reported accounting data could have been attributable mainly to the choice of one of the two accounting alternatives for recording their exploration expenditures. Eskew then examined the effect of the alternative use of these accounting methods on the degree of the association between accounting risk measures (same as those examined by BKS) and the market risk measure.

Using the Spearman rank correlation procedure, Eskew found that only the accounting risk measures based on the successful efforts costing method exhibit significant correlations with the market risk measure. This finding led Eskew to conclude that the accounting data generated by the successful efforts costing method is more useful in predicting future level of the market risk measure than the full costing method.

Implications of previous studies for this study. The three studies summarized above provided results indicating the existence of empirical associations between accounting risk measures and the market risk measure. The nature of the association between these two types of risk measures as reported in the three studies is summarized in Table II-1.

This study is similar to the Derstine and Heufner study and the Eskew study in that it investigates the effect of an accounting alternative (i.e., lease capitalization) upon the level of the association between accounting and the market risk measures. As a result, the

TABLE II-1. Summary of results from three studies on the association between accounting risk measures and the market risk measure.

Accounting Variable	BKS	Derstine			Eskew	
	Unadjusted	LIFO	FIFO	Combined	Full Costing	Successful Efforts Costing
Payout	(-)*	(-)	(-)	(-)	(-)	(-)*
Growth	(+)*	N/E	N/E	N/E	(-)	(+)*
Leverage	(+)*	(+)*	(+)	(+)	(+)	(+)*
Liquidity	(-)*	N/E	N/E	N/E	(+)	(-)*
Size	(-)*	N/E	N/E	N/E	(-)	(-)*
Earnings Variability (based on market data)	(+)*	(+)*	(+)*	(+)*	(+)	(+)*
Covariability of earnings (based on market data)	(+)*	(+)*	(+)*	(+)*	(-)	(+)*
Earnings Variability (based on accounting data)	N/E	(+)*	(+)*	(+)*	N/E	N/E
Covariability of earnings (based on accounting data)	N/E	(+)*	(+)*	(+)*	N/E	N/E

*Significant at .05 level.

NOTE: (-) = negative correlation;
 (+) = positive correlation;
 N/E = not examined in the study.

findings from the earlier studies can be used as a basis for evaluating and interpreting the results obtained in this research.

II. LITERATURE ON POTENTIAL ECONOMIC IMPACT OF LEASE INFORMATION DISCLOSURE

The second objective of this study is to examine the impact of the disclosure of lease information upon the level of the market risk measure. The importance of this objective is based on the existence of a controversy over the potential economic consequences of requiring the lessees to capitalize their lease commitments, as does SFAS 13. In this section a summary of this controversy is presented. This is followed by a review of the studies that have investigated the effect of the disclosure of lease information upon stock price behavior.

Controversy Over the Potential Impact of the Disclosure of Lease Information

Functional fixation theory. Basically, the functional fixation theory asserts that investors can be "fooled" by reported accounting data. As Beaver [1972] explained, "[two securities] could sell for different prices, simply because of the way the accountant reported the results of operations" (p. 21). Ijiri, Jaedicke, and Knight [1966] described the term functional fixation as:

A psychological factor . . . found in most human behavior in which the person attaches a meaning to a title or object and is unable to see alternative meanings or uses. . . . If the outputs from different accounting methods are called by the same name such as profit, cost, etc., people who do not understand accounting will tend to neglect the fact that alternative methods may have been used to prepare the outputs. (p. 194)

Relating to the lease issue, opponents of lease capitalization appear to hold the view of the functional fixation theorist. They believe that capitalizing lease commitments will lead investors and creditors to equate the lease commitments to debt obligations. This belief is implicit in the following passage:

. . . lessees contended that requiring them to show lease commitments as debt would hurt their credit, inflate their financing cost and damage the economy. Those who opposed capitalization of leases based their claims on economic grounds, rather than accounting theory, according to observers. There were frequent predictions of dire [economic] impact. [Journal of Accountancy, 1975, p. 7]

Further, it was argued that requiring capitalization of leases would drive up cost of capital for companies in the United States by as much as four billion dollars during the first year alone [Journal of Accountancy, 1975].

Only anecdotal evidence is available to support the above assertions. As recently reported by Shakin [1977] some lessees would have to curtail their borrowings as well as pay higher interest on all their loans as a consequence of the SFAS 13 requirements. Moreover, it was speculated that some lessees might slow down their expansion plans because their leases would soon appear on their balance sheets and that other lessees might shift from financing (capital) leases to more expensive operating leases [Shakin, 1977].

The foregoing arguments against lease capitalization have important implications for accounting research. These arguments imply that the way accountants report economic events can have influence on the perception of creditors and investors regarding the firm's financial position and results of operation. As Van Horne [1974] noted:

Because the lease obligation generally is not disclosed in the balance sheet as a liability but rather treated as a footnote to the financial statement, certain creditors and investors may not recognize the full implications of this contractual commitment. To the extent that it is not recognized, the ability of the firm to raise additional funds may seem better than it would if the assets were purchased and financed by debt. (p. 598)

However, as discussed below, recent research has provided empirical evidence that is contradictory to the above arguments.

Efficient market hypothesis (EMH). In recent accounting and finance literature what is known as the efficient market hypothesis (EMH) has been extensively documented.² Basically, there are three forms of the EMH. The weak form asserts that stock prices follow a random pattern, i.e., past stock prices cannot be used to predict future stock prices. The semi-strong form of the EMH states that at any given time stock prices reflect all publicly available information and that these prices adjust quickly and unbiasedly to new information that becomes available to the public. The strong form of the EMH goes as far as stating that even information available only to corporate insiders is impounded in stock prices.

Substantial evidence has been provided in the literature supporting the semi-strong form of the EMH. The evidence suggests, as some proponents of lease capitalization argue, that the capitalization requirements imposed by SFAS 13 would not have any significant impact upon the perception of investors and creditors regarding the risk and return

²For a full development of the EMH and a review of related empirical studies, see Fama [1970]. See also Beaver [1972] and Dyckman, Downes, and Magee [1975] for implications of the EMH for accounting research.

characteristics of lessees. This is because the SFAS 13 requirements only differ in form, not in content, from those of APB Opinion 31 and ASR 147. Instead, it is argued that any potential impact of requiring lease capitalization on lessees would have already occurred in 1973 or in 1974 when the lessees disclosed their lease information for the first time. Therefore, the question remained to be answered is whether or not the disclosure of lease information in compliance with APB Opinion 31 and ASR 147 had any economic impact upon the lessees. A potential economic consequence of the lease disclosure is its effect upon stock price behavior. The remainder of this section reviews three empirical studies which have investigated this.

Previous Empirical Research on Market Reaction to the Lease Information Disclosure Under APB Opinion 31 and ASR 147

A methodology commonly used in the literature to detect the effect of the announcement or disclosure of an accounting information item upon the investor's assessment of security risk-return characteristics is the examination of the distribution of security returns around the time when the information item is made public. Any unusual distribution of returns detected would indicate that the market "reacts" to the new information; i.e., the market adjusts stock prices to reflect the new information. Three studies known to have examined the market reaction to the disclosure of lease information as required by APB Opinion 31 and ASR 147 are summarized below.

(1) Byung T. Ro [1977a]. Ro conducted two studies relating to the requirements of ASR 147. In his first study, he selected ninety-nine lessee firms listed on the New York Stock Exchange that complied

with ASR 147 for the first time in their December, 1973 financial statements. Each of these lessee firms was then matched with a non-lessee firm having approximately the same market risk value. A multivariate statistic, the Hotelling T^2 test, was used to determine any significant differences between the returns from the two groups during the period from January, 1973 through September, 1974. Within the lessee group, the firms were further divided into (a) those that disclosed the present value of their lease commitments only, and (b) those that disclosed both the present value of their lease commitments and the impact of capitalizing these commitments upon their reported net income.

Based on the observed differences between the cumulative average returns of the lessee and the non-lessee firms, Ro concluded that (a) the market reacted only to the disclosure of the combination of both the present value and the income effect lease commitments, i.e., stock prices of lessees that disclosed both items were adjusted downward, (b) the market reaction to the lease information began as early as March, 1973, and (c) the adverse impact of the ASR 147 requirements was more severe for firms with high risk than for firms with low risk.

(2) Byung T. Ro [1977b]. The objective of Ro's second study was to evaluate the SEC's criteria concerning the materiality of financing leases (see Chapter I). Ro argued that if investors considered the SEC's materiality criteria to be significant they should react differently to the lessees that had to comply with ASR 147 from the lessees that only had to comply with APB Opinion 31 (because they did not have material financing leases).

The overall methodology used in the second study is essentially the same as that used in the first study. In the second study, however, Ro paired each ASR 147 lessee with an APB Opinion 31 lessee. Unlike the results obtained in the first study, Ro reported no significant differences in cumulative average returns between the two groups. More specifically, the market reacted in the same manner to both groups. Based on this finding, Ro concluded that investors do not distinguish between financing leases and other noncancelable leases; i.e., the disclosure of lease commitments per se affected stock prices.

(3) May, Harkins, and Rice (MHR) [1977]. MHR criticized the two Ro studies for having a limited scope. Specifically, MHR contended that Ro overlooked the interdependency between ASR 147 and APB Opinion 31 requirements and that non-financing leases should be as important to investors as financing leases. Accordingly, the three researchers hypothesized that the size of all noncancelable leases (which includes financing leases) rather than the distinction between financing and non-financing leases, would be more important to investors.

MHR randomly selected 314 firms from the New York Stock Exchange and the American Stock Exchange listings. These firms were then grouped according to the amount of lease information they disclosed. For example, those lessees that disclosed both the present value of their financing leases and the impact of capitalizing these leases on the reported net income formed a group. Those that disclosed only a schedule showing their future lease commitments formed another group. In addition, these sample firms were also grouped according to several other criteria including the size of their noncancelable lease commitments.

To detect the market reaction to different groups of the sample firms, MHR employed the two factor model which was developed by Black, Jensen, and Scholes [1972] and Fama and Macbeth [1973]. The model was used to compute the average cumulative residuals of the firms' security returns during the period from January, 1970 through December, 1974. From the results of the MHR study, four important conclusions can be enumerated.

1. The increased disclosure requirements under APB Opinion 31 and ASR 147 only had a significantly adverse effect upon the price structure of lessees whose lease commitments were material.³
2. The additional disclosure requirements concerning financing leases by ASR 147 might have been superfluous to investors. Thus, the policy makers should be more concerned with the descriptiveness of the disclosure rather than with the format of the disclosure or the location at which the disclosure was to be made.

³MHR measured the materiality of lease commitments by examining a lease coverage ratio (LC) defined as

$$LC = \frac{MR_{t+1}}{\frac{FF_t + FF_{t-1}}{2} + MR_{t+1}}$$

where, FF_t and FF_{t-1} are the funds flow from operations for the year of first compliance and the prior year, respectively, approximated from COMPUSTAT reported income adjusted for depreciation and amortization, deferred taxes, etc.

MR_{t+1} is the minimum annual rental commitment in the first year following the balance sheet date of first compliance.

3. Since FASB capital leases are essentially the same as SEC financing leases, SFAS 13 should not have any discernible impact upon the lessees' stock price behavior.
4. Market reactions to the APB Opinion 31 and ASR 147 disclosure requirements took place long before the official release of the two pronouncements was made (as early as the fourth quarter of 1971).

Implications for this research. Like the two Ro studies and the MHR study, an objective of this study is to investigate the impact of the disclosure of lease information on lessees. However, the approach being used here can be distinguished from those used in the other studies.

1. In their studies, Ro and MHR measured the impact of the disclosure of lease information by examining the behavior of the residuals (unsystematic risk component). Since the residuals were computed by removing the market effects (systematic risk component) from the relative price changes, Ro and MHR were apparently not interested in the effect of the disclosure on the systematic risk (i.e., the market risk measure). On the contrary, the market risk measure is a variable of interest in this study.

2. The time horizons covered in this study and in the other three studies are also different. As shown in Figure II-1, the Ro [1977a] study covered the period between January, 1973 and September, 1974 (21 months) whereas the time horizon examined by MHR extended from February, 1970 through December, 1974 (59 months). In this study, a

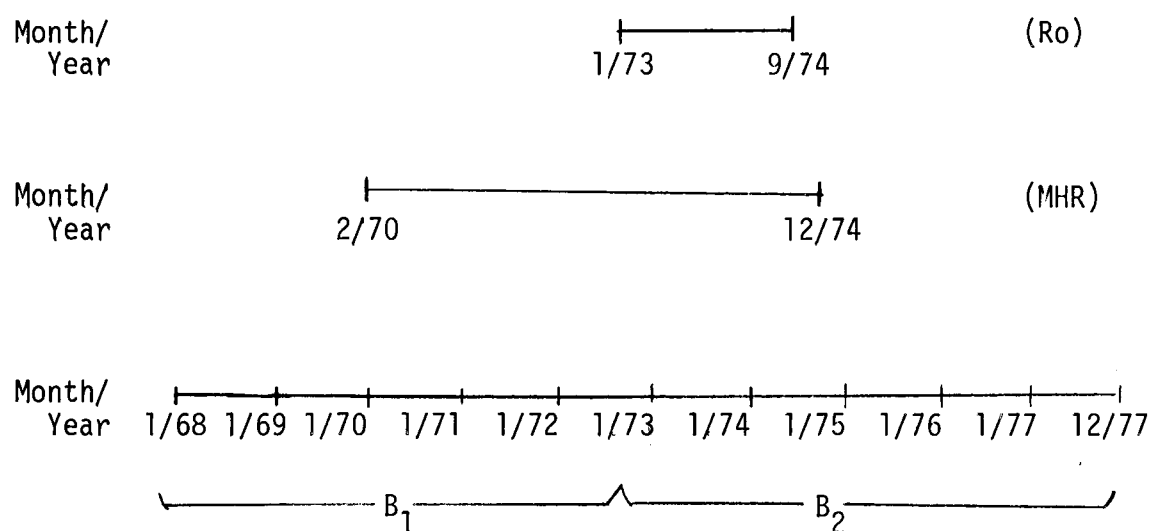


FIGURE II-1. A comparison of the time horizons investigated in this study and in other studies.

period of 120 months encompassing the periods studied by both Ro and MHR is being examined.

3. Both Ro and MHR studies reported that the market adjusted stock prices of certain lessees during the period surrounding the first disclosure of lease information in compliance with APB Opinion 31 and ASR 147. Further, MHR provided evidence indicating that the adjustment process began as early as September, 1971 and that by the time the disclosure of lease information was first made in 1973 and 1974, the adjustment process had virtually been completed. This finding has important implication for the result concerning the impact of the disclosure of lease information upon the market risk measure of the lessees' common stocks that can be expected from this research undertaking. More precisely, since the market had anticipated the lease information to be disclosed by lessees and had already adjusted (fully or nearly fully) for the information, the disclosure per se should not have any impact upon lessees' stock prices. Thus, it can be anticipated that no significant difference between the level of the market risk measure during the pre-disclosure period and that during the post-disclosure period will be found in this study.

III. SUMMARY

In this chapter, a review of the literature related to the purposes of this study was presented. In the first section of the chapter, the importance of the market risk measure to investors in their evaluation of stock prices was explained. Next it was recognized that there exists a theoretical relationship between the market risk measure

and the financing mix of the firm. This relationship, however, must be viewed with caution because of the questions regarding the validity of the assumptions underlying the theory and the investor's perception concerning lease commitments and debt. The first section concluded with a review of three studies undertaken to investigate the association between the market risk measure and certain accounting risk measures. The findings of these studies indicated that the two types of risk measures are associated and that the associations are in a consistent direction. These findings provide a basis for comparing and interpreting the results obtained in this study.

In the second section of the chapter, a discussion on the potential impact of the disclosure of lease information upon the lessees' security prices was presented. One of the two views regarding this subject was that capitalization of leases would bring undesirable economic consequences to lessees because investors and creditors would equate the capitalized lease value to debt obligations. The other view, however, argued that since the present value of lease commitments had already been disclosed in the footnotes to the financial statements of lessees, creditors and investors were aware of the existence of lease commitments. Therefore, the capitalization of leases, which would not reveal any new lease information, should not result in adverse economic consequences to lessees. However, should there have been any economic impact due to lease capitalization, this impact would have taken place when the APB Opinion 31 and ASR 147 requirements became effective in 1973 and 1974. A review of three studies revealed that stock prices adjusted for the disclosure of the lease information (as observed through the

returns of the lessees' securities) in the period surrounding the disclosure. The question as to whether the disclosure of lease commitments affect the assessment of the market risk measure is a subject being investigated in this study.

CHAPTER III

METHODOLOGY

In the preceding two chapters the objectives of the study and a review of the related literature were presented. The purpose of this chapter is to develop a methodology for each of the two objectives. Specifically, the variables to be examined are defined. The hypotheses are then enumerated. This is followed by a detailed discussion of the research methodologies used including sample design, data base, computation of the variables, and the statistical techniques employed in testing the hypotheses.

I. DEFINITIONS OF THE VARIABLES

Two categories of variables are being examined in this study: accounting risk measures and the market risk measure. The accounting risk measures are further adjusted to reflect the effect of capitalizing (a) financing leases, and (b) all noncancelable leases. In this section, the definitions of the accounting risk measures and the procedure used to adjust them for the influence of lease capitalization are delineated. Finally, the method used in estimating the market risk measure is described.

Selection and Definitions of Accounting Risk Measures

Accounting risk measures selected. The accounting risk measures selected for the purpose of this study are the same as those used in previous studies [BKS, 1970; Eskew, 1975]. In previous studies, however, these accounting risk measures did not reflect the potential effect of lease capitalization. These accounting risk measures are (1) dividend payout, (2) asset growth, (3) leverage, (4) liquidity, (5) asset size, and (6) earnings variability or standard deviation of earnings.¹ These six accounting risk measures are selected for three reasons. First, all of them are affected by lease capitalization.² Secondly, since they have been found to be associated with the market risk measure in earlier research, at least one group of these variables (either adjusted or unadjusted for lease capitalization) should exhibit certain degree of

¹The other accounting risk measure that was also examined in previous studies was covariability of earnings. This variable, however, is not being used in this study for two reasons. First, only four observations would have been available for computing this risk measure. Such a small number of observations would have produced a large sampling error. Therefore, the resulting estimate of the variable would not have been reliable. Secondly, a variable that enters into the computation of the covariability of earnings is the average earnings/price ratio for all firms in the capital market. Since the income effect of capitalizing leases is not available from a mechanically accessible source, it is not feasible to calculate this accounting risk measure.

²The capitalization of leases has the following influence on the reported accounting variables: (a) current liabilities are increased by the amount of lease commitment due within one year, (b) total liabilities and total assets are increased by approximately the amount of the present value of the lease commitments, and (c) subject to the timing of the capitalization the net income may be either negatively or positively affected (see, for example, Kieso and Weygandt [1974] for further detail). The potential effect of capitalizing leases on reported earnings is explained in Appendix B of this dissertation.

association with the market risk measure. Finally, the results obtained in previous studies concerning the association between these accounting risk measures and the market risk measure can be used as a standard by which the results obtained in this study are evaluated and interpreted.

Definitions of the accounting risk measures. Three sets of accounting risk measures are computed in this study. Set 1 accounting risk measures are based on the accounting data as they appear on the financial statements (these are the accounting risk measures examined in the BKS study). Set 2 accounting risk measures are Set 1 accounting risk measures adjusted for the effect of capitalizing financing leases only. Set 3 accounting risk measures represent Set 1 accounting risk measures adjusted for the effect of all noncancelable leases. Specific formulas and definitions of the variables used in computing these three sets of the accounting risk measures follow.

(1) Set 1 accounting risk measures.

$$\text{Dividend payout (Set 1 DP)} = \frac{\sum_{t=1}^T D_t}{\sum_{t=1}^T E_t}$$

$$\text{Asset growth (Set 1 AG)} = \ln \left[\frac{TA_T}{TA_0} \right] / T$$

$$\text{Leverage (Set 1 LV)} = \frac{\sum_{t=1}^T \left[\frac{SS_t}{TA_t} \right]}{T}$$

$$\text{Liquidity (Set 1 CR)} = \frac{\sum_{t=1}^T \left[\frac{CA_t}{CL_t} \right]}{T}$$

$$\text{Asset size (Set 1 AZ)} = \frac{\sum_{t=1}^T \ln(TA_t)}{T}$$

$$\text{Earnings variability (Set 1 EV)} = \left[\frac{\sum_{t=1}^T (E_t/P_{t-1} - (\bar{E}/P))^2}{T} \right]^{1/2}$$

where

D_t = dividends paid or declared on common stock in period t .

E_t = income available to common stockholders in period t .

$\ln$ = natural logarithm.

TA_T = total assets at the end of T periods.

TA_0 = total assets at the beginning of the period.

T = number of periods (e.g., four years).

SS_t = total senior securities including current liabilities, total long-term debt, and total liquidating value of preferred stock.

CA_t = total current liabilities in period t .

P_{t-1} = market value of common stock at the beginning of period t .

$\bar{E}/P = \left[\frac{\sum_{t=1}^T E_t/P_{t-1}}{T} \right] =$ the mean of the earnings/price ratios for the T periods.

(2) Set 2 accounting risk measures.

$$\text{Dividend payout (Set 2 DP)} = \frac{\sum_{t=1}^T D_t}{\sum_{t=1}^T (E_t - IF_t)}$$

$$\text{Asset growth (Set 2 AG)} = \ln \left[\frac{TA_T + PF_T}{TA_0 + PF_0} \right] / T$$

$$\text{Leverage (Set 2 LV)} = \frac{\sum_{t=1}^T \left[\frac{SS_t + PF_t}{TA_t + PF_t} \right]}{T}$$

$$\text{Liquidity (Set 2 CR)} = \frac{\sum_{t=1}^T \left[\frac{CA_t}{CL_t + RF_{t+1}} \right]}{T}$$

$$\text{Asset size (Set 2 AZ)} = \frac{\sum_{t=1}^T \ln(TA_t + PF_t)}{T}$$

$$\text{Earnings variability (Set 2 EV)} = \left[\frac{\sum_{t=1}^T \left\{ (E_t - IF_t) / P_{t-1} - [(E - IF) / P] \right\}^2}{T} \right]^{1/2}$$

where

IF_t = income effect of capitalizing financing leases in period t .

PF_T = present value of financing leases at the end of the T periods.

PF_0 = present value of financing leases at the beginning of the T periods.

RF_{t+1} = rent on financing leases due in the following period.

$$\frac{\overline{E - IF}}{P} = \left[\frac{\sum_{t=1}^T (E_t - IF_t)/P_{t-1}}{T} \right] / T = \text{the mean of the earnings/price ratios adjusted for the effect of capitalizing financing leases for the } T \text{ periods.}$$

(3) Set 3 accounting risk measures.

$$\text{Dividend payout (Set 3 DP)} = \frac{\sum_{t=1}^T D_t}{\sum_{t=1}^T (E_t + IA_t)}$$

$$\text{Asset growth (Set 3 AG)} = \ln \left[\frac{TA_T + PA_T}{TA_0 + PA_0} \right] / T$$

$$\text{Leverage (Set 3 LV)} = \frac{\sum_{t=1}^T \left[\frac{SS_t + PA_t}{TA_t + PA_t} \right]}{T}$$

$$\text{Liquidity (Set 3 CR)} = \frac{\sum_{t=1}^T \left[\frac{CA_t}{CL_t + RA_{t+1}} \right]}{T}$$

$$\text{Asset size (Set 3 AZ)} = \frac{\sum_{t=1}^T \ln(TA_t + PA_t)}{T}$$

$$\text{Earnings variability (Set 3 EV)} = \left[\frac{\sum_{t=1}^T \left\{ (E_t - IA_t)/P_{t-1} - \left[(\overline{E - IA})/P \right] \right\}^2}{T} \right]^{1/2}$$

where

IA_t = income effect of capitalizing all noncancelable leases in period t .

PA_t = present value of all noncancelable leases in period t .

PA_T = present value of all noncancelable leases at the end of the T periods.

PA_0 = present value of all noncancelable leases at the beginning of the T periods.

RA_{t+1} = rent on all noncancelable leases due in the following period.

$\frac{E - IA}{P} = \left[\sum_{t=1}^T (E_t - IA_t) / P_{t-1} \right] / T$ = the mean of the earnings/price ratios adjusted for the effect of capitalizing all noncancelable leases for T periods.

Estimation of the market risk measure. The market risk measure (B_j) as defined under the capital asset pricing model discussed in Chapter II is the theoretical beta coefficient of a regression equation which is not observable. This variable, however, can be estimated through the use of the market model [Sharpe, 1963] which uses ex post stock price data.³ The model is expressed algebraically as

$$R_{jt} = a_j + b_j I_t + e_{jt} \quad (3-1)$$

where

R_{jt} = return on security j in period t, defined as

$\ln [(D_{jt} + P_{jt}) / P_{j(t-1)}]$, where

D_{jt} = dividends declared or paid on common stock of firm j in period t.

³Another model that can be used to estimate the market risk measure is the so-called "two-factor model." There is no evidence, however, that this model is superior to the market model in estimating B_j [Brenner, 1977].

P_{jt} = closing market price of common stock of firm j
at end of period t .

$\ln$ = natural logarithm.

I_t = return on a market index in period t .

a_j = a regression parameter.

b_j = a regression parameter used as an estimate of B_j .

e_{jt} = a random error term with an expected value of zero,

$\text{cov}(e_{jt}, I_t) = 0$, and $\text{cov}(e_{jt}, e_{it}) = 0$ for $j \neq i$.

Beaver [1972] showed that under certain simplifying assumptions b_j approximates B_j . Equation (3-1) is used in this study (and also in previous studies) to estimate the market risk measure.

II. HYPOTHESES

In general, the objectives of this study are to (1) examine the relevance of lease capitalization in making investment decisions, and (2) investigate the economic consequence of the disclosure of lease information on the lessee's financing. Accordingly, formal statements of hypotheses relating to these objectives are first stated in general terms. Each of these hypotheses is then followed by a set of supporting hypotheses.

Hypotheses Concerning the Relevance of Lease Capitalization in Making Investment Decisions

Relevance of capitalizing financing leases. Financing leases represent a subset of all noncancelable leases. Capitalizing only these leases will not reflect the full impact of all noncancelable leases. However, the findings concerning the influence of capitalizing

financing leases would have direct implications for the requirements of SFAS 13 when they become fully effective. In this connection, the following general and supporting hypotheses are stated.

(1) Main hypothesis.⁴

$H_{0(I-1)}$: The capitalization of financing leases is relevant in making investment decisions.

(2) Supporting hypotheses.

$H_{0(I-1)}^{DP}$: The dividend payout ratios adjusted for the effect of capitalizing financing leases are more closely associated with the market risk measure than the dividend payout ratios based on reported accounting data.

$H_{0(I-1)}^{AG}$: The asset growth variables adjusted for the effect of capitalizing financing leases are more closely associated with the market risk measure than the asset growth variables based on reported accounting data.

$H_{0(I-1)}^{LV}$: The leverage ratios adjusted for the effect of capitalizing financing leases are more closely associated with the market risk measure than the leverage ratios based on reported accounting data.

⁴The wordings of hypotheses $H_{0(I-1)}^{DP}$ through $H_{0(I-1)}^{EV}$ are identical, except for the name of the accounting risk measure in each hypothesis.

$H_{0(I-1)}^{CR}$: The liquidity variables adjusted for the effect of capitalizing financing leases are more closely associated with the market risk measure than the liquidity variables based on reported accounting data.

$H_{0(I-1)}^{AZ}$: The asset size variables adjusted for the effect of capitalizing financing leases are more closely associated with the market risk measure than the asset growth variables based on reported accounting data.

$H_{0(I-1)}^{EV}$: The measures of earnings variability adjusted for capitalizing financing leases are more closely associated with the market risk measure than the measures of earnings variability based on reported accounting data.

Relevance of capitalizing all noncancelable leases. It has been a contention of many authors [Myer, 1962; Wyatt, 1974] that all non-cancelable leases, not just financing leases, should be capitalized. Based on the lease information provided by lessees in compliance with APB Opinion 31 and ASR 147, this study is expanded to examine the relevance of capitalizing all noncancelable leases. The hypotheses to be tested are stated as follows.

(1) Main hypothesis.

$H_{0(I-2)}$: The capitalization of all noncancelable leases is relevant in making investment decisions.

(2) Supporting hypotheses.⁵

$H_{0(I-2)}^{DP}$: The dividend payout ratios adjusted for the effect of capitalizing all noncancelable leases are more closely associated with the market risk measure than the dividend payout ratios based on reported accounting data.

$H_{0(I-2)}^{AG}$: The asset growth variables adjusted for the effect of capitalizing all noncancelable leases are more closely associated with the market risk measure than the asset growth variables based on reported accounting data.

$H_{0(I-2)}^{LV}$: The leverage ratios adjusted for the effect of capitalizing all noncancelable leases are more closely associated with the market risk measure than the leverage ratios based on reported accounting data.

$H_{0(I-2)}^{CR}$: The liquidity variables adjusted for the effect of capitalizing all noncancelable leases are more closely associated with the market risk measure than the liquidity variables based on reported accounting data.

⁵The wordings of hypotheses $H_{0(I-2)}^{DP}$ through $H_{0(I-2)}^{EV}$ are identical, except for the name of the accounting risk measure in each hypothesis.

$H_{0(I-2)}^{AZ}$: The asset size variables adjusted for the effect of capitalizing all noncancelable lease are more closely associated with the market risk measure than the asset growth variables based on reported accounting data.

$H_{0(I-2)}^{EV}$: The measures of earnings variability adjusted for the effect of capitalizing all noncancelable leases are more closely associated with the market risk measure than the measures of earnings variability based on reported accounting data.

Financing leases versus all noncancelable leases. The question to be investigated here is whether the capitalization of one of the two lease categories (financing and noncancelable) is more relevant in making investment decisions than the capitalization of the other. Accordingly, the following hypotheses are formulated.

(1) Main hypothesis.

$H_{0(I-3)}$: The capitalization of financing leases is not as relevant as the capitalization of noncancelable leases.

(2) Supporting hypotheses.⁶

$H_{0(I-3)}^{DP}$: The dividend payout ratios adjusted for the effect of capitalizing financing leases are not as closely associated with the market risk

⁶The wordings of hypotheses $H_{0(I-3)}^{DP}$ through $H_{0(I-3)}^{EV}$ are identical, except for the name of the accounting risk measure in each hypothesis.

measure as the dividend payout ratios adjusted for the effect of capitalizing all noncancelable leases.

$H_{0(I-3)}^{AG}$: The asset growth variables adjusted for the effect of capitalizing financing leases are not as closely associated with the market risk measure as the asset growth variables adjusted for the effect of capitalizing all noncancelable leases.

$H_{0(I-3)}^{LV}$: The leverage ratios adjusted for the effect of capitalizing financing leases are not as closely associated with the market risk measure as the leverage ratios adjusted for the effect of capitalizing all noncancelable leases.

$H_{0(I-3)}^{CR}$: The liquidity variables adjusted for the effect of capitalizing financing lease are not as closely associated with the market risk measure as the liquidity variables adjusted for the effect of all noncancelable leases.

$H_{0(I-3)}^{AZ}$: The asset size variables adjusted for the effect of capitalizing financing leases are not as closely associated with the market risk measure as the asset size variables adjusted for the effect of capitalizing all noncancelable leases.

$H_{0(I-3)}^{EV}$: The measures of earnings variability adjusted for the effect of capitalizing financing leases are not as closely associated with the market risk

measure as the measures of earnings variability adjusted for the effect of capitalizing all noncancelable leases.

Hypotheses Concerning the Economic Consequence of the Disclosure of Lease Information

As discussed in Chapter II, there exists a theoretical relationship between a firm's capital structure and the market risk measure of its common stock. A change in the firm's capital structure, therefore, should be accompanied by an observed change in the level of its security's market risk measure. Based on this theoretical argument, if (a) prior to its disclosure the lease information was not known to the investor, and (b) the investor equated lease obligations to debt, an increase in the level of the market risk measure from the pre- to the post-disclosure period should be observed. An absence of a significant increase in the level of the market risk measure during these periods, however, would indicate that either (a) or (b) was not true.

The hypotheses to be tested are stated as follows:

(1) Main hypothesis.

$H_{0(II)}$: The disclosure of lease information in compliance with APB Opinion 31 and ASR 147 did affect the investor's assessment of the level of the market risk measure of lessees' securities.

(2) Supporting hypothesis.

$H_{0(II)}^S$: The mean of the population distribution of the values of the market risk measure during the pre-disclosure period (1968-72) was smaller than the

mean of the market risk measure during the post-disclosure period (1973-1977).

III. RESEARCH DESIGN

This section contains an elaboration of the research design used to test the hypotheses listed above. This includes a detailed description of the procedures employed in selecting the samples and collecting the essential data. The computation of the variables defined earlier and the statistical tests used are also discussed.

Research Design to Test the Relevance of Lease Capitalization

Sample design. Two separate samples were chosen for the purpose of testing the three sets of hypotheses concerning the relevance of capitalizing leases. The characteristics of these samples as well as the rationale for selecting them are discussed below.

(1) Sample 1. Gritta [1974] and Shakin [1977] have indicated that the industries that use leasing extensively include supermarkets, department stores and airlines. The firms in these three industries would, therefore, be most affected by the new FASB's rules on leases. This characteristic of the firms made them a primary target for this investigation, because the results obtained will represent the fullest impact of lease capitalization.

Based on this reasoning, the New York Stock Exchange (NYSE) firms that were classified on the COMPUSTAT Annual Industrial tape under the air transportation (certified) industry, the retail-grocery stores industry, and the retail-department stores industry were chosen. The

reason for limiting the scope of the study to only the NYSE firms was due to the feasibility of obtaining necessary stock price data from the CRSP tape.

Seventeen airlines, 29 department stores, and 22 grocery stores were initially included in the sample. However, the lack of essential data caused the elimination of some of the firms from the sample. The final results of selecting Sample 1 are summarized in Table III-1.

TABLE III-1. Results of sample selection procedure--Sample 1.

	Airlines	Dept. Stores	Grocery
Total number of firms in the industry	17	29	22
Eliminated due to:			
Lack of needed stock price data		(5)	(4)
Lack of needed accounting data	(1)		
Number of firms in Sample 1	16	24	18

In order to test the hypotheses concerning the relevance of lease capitalization, Sample 1 was further divided into two sub-samples: Sub-sample 1A and Sub-sample 1B.⁷ Each of the sub-samples was made up

⁷The reason for dividing the original sample (Sample 1) into two sub-samples (Sub-samples 1A and 1B) is to create a control and an experimental group from which the unadjusted and adjusted accounting risk measures can be independently computed. This procedure is necessary, because the R. A. Fisher's test of significant difference between two observed correlation coefficients requires that the correlation coefficients be calculated from independent samples. (See Hays [1973, pp. 663-64]).

of one-half of the sample firms from each of the three industries. More specifically, each sub-sample consisted of 8 airline companies, 12 department stores, and 9 grocery stores, a total of 29 firms. The specific procedure used in assigning these firms to the two sub-samples was by choosing from an alphabetical listing of the firms within each industry every other firm for one sub-sample while those remained were assigned to the other sub-sample. The firms that comprised Sub-samples 1A and 1B may be found in Table A-1 and Table A-8, respectively.

(2) Sample 2. As already pointed out, the firms in Sample 1 represent the industries in which leasing is used extensively. The findings associated with this sample may not be generalizable to lessees in other industries in which leasing is less common. To broaden the implications of the study, another sample was selected. This latter sample, Sample 2, was chosen from a sub-population of the NYSE firms. More precisely, the following procedures were used in choosing Sample 2. First, a computer program was written to identify those NYSE firms that reported the present value of their financing leases in their 1973 through 1976 financial statements. This can be accomplished because the COMPUSTAT tape records "present value of non-capitalized leases" for those firms that complied with the ASR 147 requirements. This procedure identified a sub-population of 245 lessee firms from a total of 1459 NYSE firms on the COMPUSTAT tape. These 245 lessee firms were distributed among 87 industries.

Second, from the listing of the firms as they appeared on the COMPUSTAT tape⁸ a systematic sampling technique was used to choose an

⁸Firms on the COMPUSTAT tape are listed according to their industry classifications. Within each industry, the firms are listed

initial sample. By selecting every other firm beginning with the first firm on the list, a total of 128 firms were chosen. After all of the necessary stock price and accounting data were examined, only 106 firms whose data were complete remained in the sample. These 106 firms represent 49 industries. Thus, Sample 2 represents the NYSE lessee firms in general, including the lessees in Sample 1.

Third, as in the case of Sample 1, Sample 2 was further divided into two sub-samples: Sub-sample 2A and Sub-sample 2B. Again, a systematic sampling technique was used. This procedure produced a total of 53 firms in each sub-sample. Thirty-five industries were represented in Sub-sample 2A while Sub-sample 2B was made up of firms from 36 industries. The firms included in Sub-sample 2A and Sub-sample 2B are listed in Table A-15 and Table A-22, respectively.

Data bases. Three primary sources of data were used in this study. Specific information items obtained from these sources are enumerated below.

(1) The COMPUSTAT Annual Industrial tape. For each sample firm the following financial statement data were obtained for the 1973 through 1976 fiscal years.

1. Current assets (CA).
2. Current liabilities (CL).

alphabetically. Thus, these firms are stratified according to their industry codes. By applying a systematic sampling technique to a stratified sub-population of lessees, each industry is proportionally represented. (See Mendenhall, Ott, and Scheaffer [1971, Chapter 8] for further discussion on systematic sampling techniques.)

3. Total assets (TA).
4. Total senior securities (SS) = total long term debt + current liabilities + liquidating value of preferred stock.
5. Cash dividend (D).
6. Income available to common stockholders (E).
7. Market value of common stock (P) = (closing stock price) x (number of shares outstanding).

(2) The DISCLOSURE micro fiche of annual reports and 10-K's.

For each sample firm the following lease information items were obtained for the 1973 through 1976 fiscal years.

1. Schedule of future rental commitments on other noncancelable leases.
2. Present values of non-capitalized financing leases (PF).
3. Minimum rental commitments on financing leases due in the following period (RF).
4. Discount factor used in computing the present value of non-capitalized financing leases.
5. Net income effect of financing leases.

(3) The CRSP tape. The CRSP tape provided monthly stock price data for this study. For each firm the following data were obtained.

1. Monthly stock price data (P_{jt}) for up to 120 months.
2. The Fisher's link relative index (used as a market index for the market model).

Computation of the variables. The data described above were used to compute the accounting risk measures and the market risk measure for each firm as follows.

(1) The accounting risk measures. The three sets of accounting risk measures were computed according to the formulas given earlier in this chapter.⁹ For the computation of the Set 1 and Set 2 accounting risk measures, the data collected could readily be used. However, in calculating the Set 3 accounting risk measures additional computations were made as follows:

1. The present value of other noncancelable leases (P0) was estimated by assuming that (a) the discount factor used in computing the corresponding present value of financing leases was an appropriate discount factor for the firm, (b) rents were due at the beginning of each year, and (c) rental commitments due during the three five-year periods would be spread out uniformly while all commitments due after the twentieth year were considered due at the beginning of the twenty-first year.
2. The net income effect of all noncancelable leases (IA) (which is not required to be disclosed) was estimated by assuming that the net income effect of capitalizing leases in general was proportional to the amount of the

⁹It is possible for the dividend payout ratio to be negative. In such cases, it was assumed that the ratio is equal to one. This assumption was also used in previous studies.

present value of the leases. Based on this assumption, IA is defined as

$$IF[PF + P0]/PF$$

where,

PF + P0 = estimated present value of all noncancelable leases.

IF = net income effect of financing leases.

PF = present value of financing.

P0 = estimated present value of other noncancelable leases.

(2) The market risk measure. Using the market model described earlier and the stock price data obtained from the CRSP tape, an estimate of the market risk measure for the period from January, 1973 through December, 1977 was computed for each firm. This 60-month, post-disclosure period represents the period over which the accounting risk measures were computed.

Statistical techniques used. To test the hypotheses concerning the relevance of lease capitalization in making investment decisions, the Spearman rank correlation procedure [Siegal, 1956; Barr et al., 1976] was employed. The Spearman rank correlation coefficient (r_s) is a measure of association which requires that both the accounting and market risk variables be measured in at least an ordinal scale so that the firms under study may be ranked in two ordered series according to the pair of variables being examined. The statistic r_s is calculated by the following formula:

$$r_s = 1 - \frac{6 \sum_{j=1}^N d_j^2}{N^3 - N}$$

where,

d_j = difference between firm j 's rank based on an accounting risk measure and its rank based on the market risk measure.

N = number of ranks (number of firms in the sample).

(1) Computation of r_s . Through the use of the SAS-76 statistical package [Barr et al., 1976], r_s between each accounting risk measure and the market risk measure was computed for each sub-sample. Since there were four sub-samples (1A, 1B, 2A, and 2B) and three sets of six accounting risk measures, a total of 72 r_s 's were computed.

(2) Test of significant differences between r_s 's. To test whether a significant difference between a pair of r_s 's exists, R. A. Fisher's [1930] test of significance between two observed correlation coefficients was used. The z score for this test was obtained through the formula:

$$z = \frac{\tanh^{-1} r_{s(1)} - \tanh^{-1} r_{s(2)}}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}}$$

where,

$r_{s(1)}$ and $r_{s(2)}$ = the two r_s 's under consideration.

n_1 and n_2 = the number of paired observations in each group.

Research Design to Test the Impact of the Disclosure of Lease Information

Sample design. The two samples previously described, Sample 1 and Sample 2, were also used in examining the impact of the disclosure of lease information upon the investor's assessment of the level of the market risk measure. However, these two samples were not divided into sub-samples. Furthermore, due to the lack of needed stock price data as indicated below, not all of the 58 firms in Sample 1 and 106 firms in Sample 2 were included in this part of the study.

Data base. The stock price data used in computing the variables to be investigated were obtained from the CRSP file. Since the post-disclosure period (1973-77) market risk measure had already been estimated for the sample firm, only stock price data for the pre-disclosure period (1968-72) were collected.

Computation of the variables. An estimate of the pre-disclosure market risk measure was computed through the use of the SAS-76 statistical package [Barr et al., 1976] for each firm. However, to preserve comparability between the pre-disclosure market risk measure (b_1) and the post-disclosure market risk measure (b_2), only those firms whose stock price data were available on the CRSP tape for the entire 60-month pre-disclosure period were included in the samples. Because of this constraint, only 43 firms from Sample 1 and 89 firms from Sample 2 remained. These two groups of firms made up Sample 3 and Sample 4 and are listed in Tables A-29 and A-30, respectively.

Statistical technique used. To test whether the level of the market risk measure during the pre-disclosure period was significantly less than the level of the market risk measure during the post-disclosure period, the Student t test of a difference between means [Hays, 1973] was used. The t -value is given by

$$\underline{t} = \frac{\bar{b}_2 - \bar{b}_1}{\sqrt{\frac{(N_1-1)s_1^2 + (N_2-1)s_2^2}{N_1+N_2-2} \left(\frac{N_1+N_2}{N_1N_2} \right)}}$$

where

$\bar{b}_1$ and $\bar{b}_2$ = the sample mean values of the market risk measure during the pre- and the post-disclosure periods, respectively.

N_1 and N_2 = sample sizes in the pre- and the post-disclosure periods, respectively.

s_1^2 and s_2^2 = variances of the distribution of b_1 's and b_2 's, respectively.

Based on this test procedure, if there was a significant increase in the level of the market risk measure of the lessee's common stock between the two periods, the observed t value would be positive and significantly different from zero.

IV. SUMMARY

This chapter described in detail the methodology used in this research undertaking. The definitions of the variables being investigated were given first. Sets of hypotheses relating to the objectives

of the study were then developed. The rest of the chapter was concerned with details of the research design. This included a description of the procedures used in selecting the sample firms, in collecting the necessary data and in computing the variables. Attention was also given to the statistical techniques employed to test the hypotheses.

The remaining task is to report the results of this study and to offer an interpretation of these results. This task will be accomplished in the next chapter, Chapter IV. Chapter V, the final chapter, will provide a summary and conclusions of the study.

CHAPTER IV

ANALYSES OF RESULTS

In the preceding chapter, the definitions of the variables being investigated in this study were given. Three sets of hypotheses concerning the relevance of lease capitalization in making investment decisions and one set of hypotheses concerning the economic impact of the disclosure of lease information were formulated. A detailed description of the research approaches used in testing these hypotheses was also given.

The purpose of this chapter is to present the analyses of the empirical results obtained from this research undertaking. Accordingly, tabular presentations of pertinent statistics as well as summaries of hypothesis testing results are included in this chapter. The major conclusions drawn from the findings are further discussed in Chapter V, the final chapter.

I. RESULTS CONCERNING THE RELEVANCE OF LEASE CAPITALIZATION IN MAKING INVESTMENT DECISIONS

This section is concerned with the presentation and analyses of the empirical results relating to the first objective of the study. More precisely, summary statistics for the calculated accounting risk measures are reported. The computed Spearman rank correlation coefficients are analyzed to determine whether or not to reject a hypothesis.

Statistics for the Risk Measures

As described in Chapter III, two samples of lessee firms (Sample 1 and Sample 2) were chosen for this investigation. Each sample was further divided into two sub-samples, namely, Sub-samples 1A and 1B, and Sub-samples 2A and 2B. To determine the relevance of lease capitalization in making investment decisions, three sets of six accounting risk measures and an estimate of the post-disclosure market risk measure (b_2) were calculated for each sample firm. Results of these calculations are discussed below.

(1) The market risk measure. Table IV-1 summarizes important statistics for the market risk measure computed for each sub-sample. Two observations can be made from the data. First, within each sample the average values of the market risk measure for the two sub-samples are approximately equal: 1.128 versus 1.151 in Sample 1; 1.030 versus 1.054 in Sample 2. These results indicate that the method used in dividing each sample into two sub-samples (a systematic sampling technique) actually produced two groups of lessee firms that are approximately equal in terms of the level of the market risk measure.

Second, it can be noted that the average values of the market risk measure for all four sub-samples are very close to unity, the average value of the market risk measure for all NYSE firms. Therefore, it can reasonably be concluded that the sampling technique employed did not bias the sampling results with regards to the market risk measure. These results also provide assurance that the computation of the market risk measure was free of material errors.

TABLE IV-1. Summary statistics for market risk measure.

Sample	Range	Median	Mean	Standard deviation
Sample 1:				
Sub-sample 1A	0.530 to 1.717	1.094	1.128	.343
Sub-sample 1B	0.646 to 1.846	1.069	1.151	.331
Sample 2:				
Sub-sample 2A	0.268 to 1.904	1.030	1.030	.394
Sub-sample 2B	0.198 to 2.110	0.996	1.054	.369

(2) The accounting risk measures. Summary statistics for the accounting risk measures for Sub-samples 1A and 1B are presented in Table IV-2, and for Sub-samples 2A and 2B in Table IV-3. To provide a basis for judging the reasonableness of these data, a summary of results for the accounting risk measures reported by Beaver, Kettler, and Scholes (BKS) [1970] was reproduced in Table IV-4.

Comparisons between the Set 1 accounting risk measures computed in this study and those obtained in the BKS study disclose some differences that should be mentioned. The average asset size variables for the four sub-samples are found to be noticeably larger than those examined by BKS. BKS, however, reported larger averages for dividend payout ratios and current ratios than the similar ratios obtained in this study. Finally, it should be noted that the average measures of earnings variability of Sub-sample 1A and 1B are considerably larger than those of Sub-samples 2A and 2B and of the firms studied by BKS.

The differences noted above can be attributed to the fact that the BKS study dealt with a different set of samples and time frames. There are no indications that material differences existed in the computational procedures used in the BKS study and in this study. Instead, the differences in the average accounting risk measures obtained in the two studies may have indicated that the two studies dealt with two different populations. Thus, the findings concerning the contemporaneous association between the two types of risk measurement reported in this study extend and reconfirm the findings by BKS.

A further examination of the statistics for the accounting risk measures shown in Tables IV-2 and IV-3 reveals that lease capitalization

TABLE IV-2. Summary of statistics for accounting risk measures--Sample 1.

Accounting risk measure	Sub-sample 1A				Sub-sample 1B			
	Range	Median	Mean	Standard deviation	Range	Median	Mean	Standard deviation
Dividend payout:								
Set 1	0.000 to 1.000	.259	.246	.224	0.000 to 1.775	.251	.313	.349
Set 2	0.000 to 1.000	.285	.256	.224	0.000 to 1.000	.260	.298	.251
Set 3	0.000 to 1.000	.285	.258	.230	0.000 to 1.000	.263	.304	.255
Asset growth:								
Set 1	-0.117 to 0.264	.081	.074	.080	-0.108 to 0.198	.059	.060	.069
Set 2	-0.054 to 0.350	.117	.138	.096	0.023 to 0.277	.114	.123	.067
Set 3	-0.006 to 0.365	.345	.155	.090	0.031 to 0.309	.153	.139	.072
Leverage:								
Set 1	0.397 to 0.895	.567	.586	.116	0.158 to 0.763	.575	.516	.161
Set 2	0.498 to 0.906	.686	.678	.100	0.206 to 0.832	.656	.616	.154
Set 3	0.544 to 0.911	.697	.699	.090	0.249 to 0.834	.678	.637	.154
Liquidity:								
Set 1	0.767 to 3.527	1.497	1.638	.566	0.853 to 5.686	1.674	1.947	.959
Set 2	0.749 to 2.342	1.348	1.462	.449	0.766 to 5.629	1.597	1.777	.971
Set 3	0.729 to 2.247	1.286	1.376	.427	0.744 to 3.436	1.409	1.589	.646
Asset size:								
Set 1	3.575 to 9.349	6.305	6.187	1.263	4.314 to 7.880	5.846	5.856	1.093
Set 2	4.302 to 9.379	6.597	6.445	1.211	4.603 to 8.156	5.909	6.109	1.028
Set 3	4.321 to 9.394	6.639	6.510	1.212	4.609 to 8.164	6.068	6.175	1.018

TABLE IV-2. (continued)

Accounting risk measure	Sub-sample 1A				Sub-sample 1B			
	Range	Median	Mean	Standard deviation	Range	Median	Mean	Standard deviation
Earnings variability:								
Set 1	0.008 to 0.367	.059	.087	.089	0.013 to 0.408	.054	.073	.085
Set 2	0.008 to 0.397	.057	.088	.096	0.013 to 0.404	.052	.071	.083
Set 3	0.008 to 0.400	.057	.088	.096	0.013 to 0.403	.052	.071	.083

NOTE: Set 1 accounting risk measures are computed from reported accounting data.
Set 2 accounting risk measures are Set 1 accounting risk measures adjusted for the effect of capitalizing financing leases.
Set 3 accounting risk measures are Set 1 accounting risk measures adjusted for the effect of capitalizing all noncancelable leases.

TABLE IV-3. Summary of statistics for accounting risk measures--Sample 2.

Accounting risk measure	Sub-sample 2A				Sub-sample 2B			
	Range	Median	Mean	Standard deviation	Range	Median	Mean	Standard deviation
Dividend payout:								
Set 1	0.000 to 1.775	.369	.397	.356	0.000 to 1.000	.308	.315	.196
Set 2	0.000 to 1.607	.378	.386	.311	0.000 to 1.000	.318	.361	.198
Set 3	0.000 to 1.607	.378	.387	.311	0.000 to 1.000	.325	.323	.200
Asset growth:								
Set 1	-0.117 to -0.242	.087	.071	.063	-0.228 to -0.264	.074	.069	.080
Set 2	-0.054 to -0.293	.104	.103	.065	-0.192 to -0.350	.090	.105	.090
Set 3	-0.003 to -0.307	.117	.117	.062	-0.167 to -0.365	.101	.120	.096
Leverage:								
Set 1	0.121 to 0.837	.548	.543	.141	0.282 to 0.758	.533	.530	.112
Set 2	0.206 to 0.862	.604	.598	.128	0.311 to 0.818	.597	.590	.116
Set 3	0.249 to 0.882	.616	.616	.127	0.322 to 0.823	.621	.613	.113
Liquidity:								
Set 1	0.921 to 4.069	2.190	2.188	.701	1.120 to 4.348	1.904	2.012	.672
Set 2	0.762 to 3.877	2.000	2.017	.658	0.917 to 3.939	1.813	1.858	.628
Set 3	0.731 to 3.877	1.865	1.939	.651	0.888 to 3.888	1.736	1.775	.599
Asset size:								
Set 1	3.935 to 9.349	5.832	6.060	1.231	3.553 to 9.118	5.901	6.035	1.216
Set 2	4.006 to 9.379	6.021	6.196	1.200	3.667 to 9.167	6.010	6.183	1.198
Set 3	4.046 to 9.394	6.107	6.249	1.213	3.674 to 9.202	6.242	6.242	1.184

TABLE IV-3. (continued)

Accounting risk measure	Sub-sample 2A				Sub-sample 2B			
	Range	Median	Mean	Standard deviation	Range	Median	Mean	Standard deviation
Earnings variability:								
Set 1	0.000 to 0.208	.015	.030	.039	0.001 to 0.169	.012	.024	.033
Set 2	0.000 to 0.212	.015	.031	.040	0.001 to 0.167	.012	.024	.033
Set 3	0.000 to 0.215	.015	.031	.040	0.001 to 0.166	.012	.024	.033

NOTE: Set 1 accounting risk measures are computed from reported accounting data.
Set 2 accounting risk measures are Set 1 accounting risk measures adjusted for the effect of capitalizing financing leases.
Set 3 accounting risk measures are Set 1 accounting risk measures adjusted for the effect of capitalizing all noncancelable leases.

TABLE IV-4. Summary statistics for accounting risk measures reported in the BKS [1970] study.

Accounting risk measure	Period 1 (1947-56)		Period 2 (1957-66)	
	Mean	Standard deviation	Mean	Standard deviation
Dividend payout	.482	.182	.532	.241
Asset growth	.085	.046	.064	.038
Leverage	.401	.142	.384	.142
Liquidity	3.214	2.061	3.587	5.914
Asset size	4.575	1.251	5.237	1.282
Earnings variability	.062	.052	.033	.035

NOTE: The statistics for the measure of covariability of earnings (accounting beta) reported by BKS is omitted from the table.

has a noticeable impact upon only three of the six accounting risk measures being investigated. For Sub-sample 1B, when all noncancelable leases are capitalized the average of the asset growth variables increased by 132 percent, and the leverage ratios by 23 percent while the average of the current ratios decreased by 18 percent. The effect of lease capitalization on the remaining three accounting risk measures are negligible. Furthermore, based on the results obtained it does not appear that capitalizing all noncancelable leases would have a considerably greater effect on the accounting risk measures than if only financing leases were capitalized. This finding implies that for the firms being studied the requirements of SFAS 13 would result in the capitalization of substantially all of their leases.

Finally, it should be noted that the averages of the accounting risk measures for the two sub-samples within each sample are approximately the same. This is another indication that the two sub-samples are about equal in terms of the accounting risk measures computed.

Statistics for the Measure of Association

The Spearman rank correlation procedure was used to measure the degree of association between an accounting risk measure and the market risk measure. Tables IV-5 and IV-6 summarize the Spearman rank correlation coefficients (r_s 's) calculated for Sub-samples 1A and 1B and for Sub-samples 2A and 2B, respectively. Table IV-7 shows similar r_s 's reported in three previous studies.

The r_s 's obtained in this study compare well with those found in the three earlier studies. With the exception of the asset growth variable, the signs of the r_s 's are in the same direction, i.e., the

TABLE IV-5. Summary of Spearman rank correlation coefficients between the market risk measure and the three sets of accounting risk measures--Sample 1.

Accounting risk measure	Sub-sample 1A			Sub-sample 1B		
	Set 1	Set 2	Set 3	Set 1	Set 2	Set 3
Dividend payout	-.745***	-.731***	-.732***	-.574***	-.580***	-.583***
Asset growth	-.348*	-.227	-.309*	-.445**	-.250	-.421**
Leverage	.408**	.427**	.396**	.173	.273	.184
Liquidity	-.317*	-.354*	-.344*	-.122	-.137	-.155
Asset size	-.224	-.247	-.266	-.073	-.025	-.075
Earnings variability	.734***	.755***	.753***	.402***	.370**	.369**

*Significant at .10 level.

**Significant at .05 level.

***Significant at .01 level.

TABLE IV-6. Summary of Spearman rank correlation coefficients between the market risk measure and the three sets of accounting risk measures--Sample 2.

Accounting risk measure	Sub-sample 2A			Sub-sample 2B		
	Set 1	Set 2	Set 3	Set 1	Set 2	Set 3
Dividend payout	-.230*	-.209	-.214	-.447***	-.442***	-.436***
Asset growth	-.261**	-.096	-.104	-.175	-.122	-.133
Leverage	.425***	.544***	.502***	.267**	.263**	.279**
Liquidity	-.108	-.225*	-.230*	-.108	-.140	-.153
Asset size	-.363***	-.300**	-.298**	-.480***	-.467***	-.476***
Earnings variability	.411***	.435***	.433***	.507***	.504***	.503***

*Significant at .10 level.

**Significant at .05 level.

***Significant at .01 level.

TABLE IV-7. Summary of results concerning the association between the market risk measure and the accounting risk measures examined in previous studies.

Accounting risk measure	BKS [1970]		Derstine and Huefner [1974]		Eskew [1975]	
	Period 1 (1947-56)	Period 2 (1957-66)	LIFO sample	FIFO sample	Full costing	Successful efforts costing
Dividend payout	-.49***	-.29***	-.09	-.14	-.37	-.54***
Asset growth	.27***	.01	N/E	N/E	.00	.34**
Leverage	.23***	.22***	.28	.06	.04	.46***
Liquidity	-.13**	.05	N/E	N/E	.16	-.41**
Asset size	-.06	-.16***	N/E	N/E	-.16	-.47***
Earnings variability	.66***	.45***	.48***	.52***	.19	.50***

NOTE: N/E = not examined in the study.

The three studies also reported the association between measures of covariability of earnings (accounting beta).

These correlation coefficients are for individual securities only. BKS and Derstine and Huefner also reported results regarding the association between the two types of risk measurement.

**Significant at .05 level.

***Significant at .01 level.

dividend payout, liquidity, and asset size variables are found to be inversely associated with the market risk measure whereas the leverage ratio and the measure of earnings variability are found to be positively associated with the market risk measure. The asset growth variable was found in this study to be negatively associated with the market risk measure while the opposite results was reported in previous studies. However, in a recent study Thakkar [1978] also reported a negative association between the variable and the market risk measure. Therefore, the result relating to the asset growth variable obtained in this study is not believed to have been due to errors in the computational procedure employed.

An observation that should be made regarding the data presented in Tables IV-5 through IV-7 is that not all accounting variables consistently show a significant degree of association with the market risk measure. Exception to this is the measure of earnings variability which was found to be significantly associated with the market risk measure in all of the studies being discussed. Nevertheless, the finding that the six accounting risk measures being investigated exhibit certain degree of association with the market risk measure is of interest in itself, because this study deals with different samples of firms and different time period from the other studies. The finding, therefore, adds to the existing empirical evidence regarding the association between certain accounting risk measures and the market risk measure.

Hypothesis Testing Results

Three sets of hypotheses relating to the relevance of lease capitalization in making investment decisions were formulated in the preceding chapter. To test these hypotheses, intra-sample comparisons were made between the observed r_s 's. The specific procedure was to examine the differences in the r_s 's between one set of accounting risk measures and the market risk measure in a sub-sample and the r_s 's between a different set of accounting risk measures and the market risk measure in the other sub-sample. Thus, a sub-sample may be designated as a control group while the other serves as an experimental group. Since there are four sub-samples and since only intra-sample comparisons are made, four pairs of r_s 's are compared in testing each hypothesis.

The relevance of capitalizing only financing leases. In general, the supporting null hypotheses in the $H_{0(I-1)}$ set state that a Set 2 accounting risk measure (an accounting risk measure adjusted for the effect of capitalizing financing leases) is more closely associated with the market risk measure than its Set 1 counterpart (the corresponding accounting risk measure based on reported accounting data). To test these hypotheses, comparisons were made between the observed r_s 's between Set 2 accounting risk measures and the market risk measure in the experimental group and the observed r_s 's between Set 1 accounting risk measures and the market risk measure in the control group. Results of these comparisons are presented in Table IV-8.

As can be seen from the table, all of the hypotheses in the $H_{0(I-1)}$ set, except the one relating to the measure of earnings variability in Sample 1, can be rejected at a .05 level (two-tailed test).

TABLE IV-8. Summary of hypothesis testing results--relevance of capitalizing financing leases.

Hypothesis	Sample 1		Sample 2	
	Sub-sample 1A as control group/Sub- sample 1B as experimental group	Sub-sample 1B as control group/Sub- sample 1A as experimental group	Sub-sample 2A as control group/Sub- sample 2B as experimental group	Sub-sample 2B as control group/Sub- sample 2A as experimental group
$H_{0(I-1)}^{DP}$	R (-1.080)	R (1.001)	R (1.203)	R (-1.344)
$H_{0(I-1)}^{AG}$	R (-0.389)	R (-0.893)	R (-0.723)	R
$H_{0(I-1)}^{LV}$	R (0.553)	R (-1.016)	R (0.923)	R (-1.681)
$H_{0(I-1)}^{CR}$	R (-0.687)	R (0.893)	R	R (0.603)
$H_{0(I-1)}^{AZ}$	R	R	R (0.630)	R (-1.068)
$H_{0(I-1)}^{EV}$	NR (1.982)	NR (-2.016)	R (-0.590)	R (0.464)

NOTES: The control group supplies r_s 's between Set 1 accounting risk measures and the market risk measure while the experimental group supplies r_s 's between Set 2 accounting risk measures and the market risk measure:

z scores are shown in parentheses;

R = rejected; NR = not rejected;

Formal statements of the above hypotheses can be found in Chapter III;

$P(-1.96 < z < 1.96) = .05$; $P(-2.58 < z < 2.58) = .01$; and

Four of the hypotheses shown in the table are rejected without performing a test of significance, because both of the r_s 's being compared are not significant at .01 level or better.

This means that the capitalization of financing leases does not produce a set of accounting risk measures that are more closely associated with the market risk measure than a set of accounting risk measures computed from the financial statement data.

The differences in the r_s 's for the measure of earnings variability in Sub-samples 1A and 1B are found to be significant at a .05 level. The differences, however, are not significant at a .01 level. Moreover, the z score had a positive sign when Sub-sample 1B was used as a control group, but a negative sign when Sub-sample 1A was used as a control group. Theoretically and empirically, the measure of earnings variability should be positively associated with the market risk measure. Therefore, it cannot be concluded that the measure of earnings variability adjusted for the effect of capitalizing financing leases (Set 2 measure of earnings variability) is in fact more closely associated with the market risk measure than the measure of earnings variability based on reported accounting data (Set 1 measure of earnings variability).

Based on the results obtained and the foregoing analyses, there is no evidence that the capitalization of financing leases is relevant in making investment decisions.

The relevance of capitalizing all noncancelable leases. The second set of supporting null hypotheses, $H_{0(I-2)}$, state in general that an accounting risk measure which reflects the capitalization of all noncancelable leases (a Set 3 accounting risk measure) is more closely associated with the market risk measure than the corresponding

accounting risk measure computed from the reported accounting data (a Set 1 accounting risk measure). To test these hypotheses, comparisons were made between the observed r_s 's between Set 3 accounting risk measures and the market risk measure and the observed r_s 's between Set 1 accounting risk measures and the market risk measure. Table IV-9 summarizes the results of these comparisons.

From the results obtained, all of the hypotheses in set $H_{0(I-2)}$, except $H_{0(I-2)}^{EV}$ in Sample 1, can be rejected at a .05 level. Similar results were obtained for the measure of earnings variability in Sub-samples 1A and 1B as before. Therefore, it is concluded that there is no evidence to support a hypothesis that capitalizing all noncancelable leases would produce a set of accounting risk measures that are more closely associated with the market risk measure than a set of accounting risk measures calculated from the financial statement data.

Relative relevance of financing versus all noncancelable leases.

The question being addressed here is whether the capitalization of financing leases only is more relevant in making investment decisions than the capitalization of all noncancelable leases, or vice versa. More specifically, would the capitalization of one type of leases generate a set of accounting risk measures that are more closely associated with the market risk measure than the capitalization of the other type of leases? The $H_{0(I-3)}$ hypotheses basically state that Set 2 accounting risk measures are not as closely associated with the market risk measure as Set 3 accounting risk measures. Rejection of these hypotheses would indicate that there are no differences in the degree

TABLE IV-9. Summary of hypothesis testing results--relevance of capitalizing all noncancelable leases.

Hypothesis	Sample 1		Sample 2	
	Sub-sample 1A as control group/Sub- sample 1B as experimental group	Sub-sample 1B as control group/Sub sample 1A as experimental group	Sub-sample 2A as control group/Sub sample 2B as experimental group	Sub-sample 2B as control group/Sub- sample 2A as experimental group
$H_{0(I-2)}^{DP}$	R (-1.064)	R (1.009)	R (1.166)	R (-1.318)
$H_{0(I-2)}^{AG}$	R (0.309)	R (0.574)	R (-0.667)	R
$H_{0(I-2)}^{LV}$	R (0.892)	R (-0.881)	R (0.604)	R (-1.392)
$H_{0(I-2)}^{CR}$	R (-0.621)	R (0.852)	R	R (-0.629)
$H_{0(I-2)}^{AZ}$	R	R	R (0.688)	R (-1.079)
$H_{0(I-2)}^{EV}$	NR (1.986)	NR (-2.000)	R (-0.583)	R (0.612)

NOTES: The control group supplies r_s 's between Set 1 accounting measures and the market risk measure while the experimental group supplies r_s 's between Set 3 accounting risk measures and the market risk measure;

z scores are shown in parentheses;

R = rejected; NR = not rejected;

Formal statements of the above hypotheses can be found in Chapter III;

$P(-1.96 < z < 1.96) = .05$; $P(-2.58 < z < 2.58) = .01$; and

Four of the hypotheses shown in the table are rejected without performing a test of significance, because both of the r_s 's being compared are not significant at .01 level or better.

of association between Set 2 accounting risk measures and the market risk measures on the one hand, and the degree of association between Set 3 accounting risk measures and the market risk measure on the other. The results of the test of these hypotheses are presented in Table IV-10. Again, the only hypothesis that cannot be rejected at a .05 level is hypothesis $H_{0(I-3)}^{EV}$ relating to the measure of earnings variability in Sub-samples 1A and 1B. Based on these results, the main hypothesis $H_{0(I-3)}$ is rejected. There is no evidence that the capitalization of one type of leases is more relevant in making investment decisions than the capitalization of the other type of leases.

Summary

In this section, three sets of hypotheses concerning the relevance of lease capitalization in making investment decisions were tested and the testing results were presented. Based on these results, it was concluded that lease capitalization would not produce a set of accounting risk measures that are more closely associated with the market risk measure than a set of accounting risk measures that are not adjusted for lease capitalization. It was also concluded that capitalizing only financing leases would not be more relevant in making investment decisions than capitalizing all noncancelable leases, and vice versa.

Further Analyses of Results

The conclusion above that lease capitalization is not relevant in making investment decisions appears to contradict the general belief that has been expressed in the literature over the years. This conclusion, therefore, warrants further explanation.

TABLE IV-10. Summary of hypothesis testing results--relative relevance of capitalizing financing leases versus capitalizing all noncancelable leases.

Hypothesis	Sample 1		Sample 2	
	Sub-sample 1A as control group/Sub- sample 1B as experimental group	Sub-sample 1B as control group/Sub- sample 1A as experimental group	Sub-sample 2A as control group/Sub- sample 2B as experimental group	Sub-sample 2B as control group/Sub- sample 2A as experimental group
$H_{0(I-3)}^{DP}$	R (-0.953)	R (0.977)	R (1.276)	R (-1.287)
$H_{0(I-3)}^{AG}$	R (0.787)	R (0.231)	R	R
$H_{0(I-3)}^{LV}$	R (0.975)	R (-0.501)	R (1.616)	R (-1.414)
$H_{0(I-3)}^{CR}$	R (-0.771)	R (0.797)	R (-0.374)	R (0.467)
$H_{0(I-3)}^{AZ}$	R	R	R (1.042)	R (-0.995)
$H_{0(I-3)}^{EV}$	NR (2.156)	NR (-2.135)	R (-0.437)	R (0.456)

NOTES: The control group supplies r_s 's between Set 2 accounting risk measures and the market risk measure while the experimental group supplies r_s 's between Set 3 accounting risks measures and the market risk measure;

z scores are shown in parentheses;

R = rejected; NR = not rejected;

Formal statements of the above hypotheses can be found in Chapter III;

$P(-1.96 < z < 1.96) = .05$; $P(-2.58 < z < 2.58) = .01$; and

Four of the hypotheses shown in the table are rejected without performing a test of significance, because both of the r_s 's being compared are not significant at .01 level or better.

There are two reasons that may have explained why lease capitalization failed to produce a set of accounting risk measures whose level of association with the market risk measure is different from that of a set of accounting risk measures based on reported accounting data. The first reason may have been that the effect of lease capitalization on the accounting risk measures is not material. In a previous analysis of results obtained for the accounting risk measures computed, it was pointed out that lease capitalization only had discernible impact on the asset growth, leverage, and liquidity variables. Its influence on the other three accounting risk measures was negligible.

The second reason that may explain the results obtained is implicit in the underlying methodology used in this study. More specifically, if lease capitalization does not change the relative positions (rankings) of the firms in terms of their accounting risk measures, the capitalization cannot be expected to yield a different degree of association between the accounting and market risk measures. To provide further insight into this issue, the r_s 's between each pair of the three sets of accounting risk measures were calculated for Samples 1 and 2 and presented in Table IV-11. As the statistics in the table indicate, the three sets of accounting risk measures are highly correlated. All of the observed r_s 's are significant at a .01 level. This means that neither the capitalization of financing leases nor the capitalization of all noncancelable leases had a significant impact upon the ranking of the firms according to their accounting risk measures. This finding, although entirely unexpected, serves to explain the results being reported in this study.

TABLE IV-11. Summary statistics of the association among the three sets of accounting risk measures in Sample 1 and Sample 2.

Accounting risk measure	Sample 1			Sample 2		
	Set 1 versus Set 2	Set 1 versus Set 3	Set 2 versus Set 3	Set 1 versus Set 2	Set 1 versus Set 3	Set 2 versus Set 3
Dividend payout	.992***	.989***	.999***	.b96***	.995***	.999***
Asset growth	.867***	.829***	.933***	.909***	.840***	.951***
Leverage	.900***	.890***	.961***	.920***	.850***	.939***
Liquidity	.973***	.968***	.976***	.957***	.934***	.975***
Asset size	.992***	.989***	.995***	.992***	.989***	.994***
Earnings variability	.997***	.996***	.999***	.998***	.998***	.999***

***Significant at .01 level.

II. RESULTS CONCERNING THE ECONOMIC IMPACT OF THE DISCLOSURE OF LEASE INFORMATION

The second objective of the study is to provide evidence regarding the economic impact of the disclosure of lease information. Specifically, the interest is in whether or not the disclosure of lease information in compliance with APB Opinion 31 and ASR 147 affected the assessment by investors regarding the degree of the riskiness of the lessee's common stock. The degree of riskiness is measured by the level of the market risk measure; i.e., the higher the level, the riskier the securities. Thus, an increase in the level of the market risk measure means a higher cost of equity capital for the firm. A finding that there has been an increase in the level of the market risk measure from the pre- to post-disclosure period would provide an indication that the lessee was adversely affected by the disclosure of lease information.

The methodology used to investigate this question was discussed in Chapter III. Basically, it was hypothesized that the disclosure of lease information did have an adverse economic impact on the lessee. To test this hypothesis, a pre-disclosure market risk measure (b_1) was computed for the firms in Sample 1 and Sample 2. This pre-disclosure period covers a period of 60 months prior to the disclosure of lease information (January, 1968 through December, 1972). Because of lack of stock price data on the CRSP tape only 43 firms in Sample 1 and 89 firms in Sample 2 whose data for the entire period were available were selected for this phase of the study. The 43 firms made up Sample 3 while the 89 firms made up Sample 4.

Table IV-12 summarizes pertinent test statistics for the second objective. The results presented in the table indicate that the cross-sectional mean of the market risk measure in Sample 3 decreased by .05552 and in Sample 4 by .07147 from the pre- to post-disclosure period. The t statistics are -.06717 for Sample 3 and -1.33363 for Sample 4 which are not significant. The cross-sectional medians for both samples also decreased. These order statistics do not indicate that there had been an upward shift in the population distribution of the market risk measure between the two periods. Consequently, the hypothesis that the disclosure of lease information had an economic impact upon the lessee is rejected.

Additional Analyses of Results

In the foregoing analysis, the five-year period immediately preceding 1973 was regarded as the pre-disclosure period. However, as reported by Ro and MHR (see Chapter III of this study), the market had apparently anticipated the lease information to be disclosed by lessees and had already begun to adjust the lessees' stock prices accordingly. Furthermore, MHR concluded in their study that the stock price adjustment process took place between the fourth quarter of 1971 and mid 1974. Up to this point, the effect of including this period of price adjustment upon the results obtained above is not known.

To provide further evidence concerning the impact of the disclosure of lease information upon the level of the market risk measure, an additional analysis of the lessees' stock price data was performed. This time, however, the pre-disclosure period was defined as the period between January, 1968 and December, 1970 whereas the

TABLE IV-12. Changes in the level of the market risk measure from the pre- to post-disclosure period.

Sample	b ₁			b ₂			Change in t value	Change in median	
	Mean	Standard deviation	Median	Mean	Standard deviation	Median			
3 (N = 43)	1.19448	.43872	1.24583	1.13896	.31824	1.09411	-.05552	-0.67172	-.15172
4 (N = 89)	1.08650	.35014	1.03844	1.01503	.36474	.99284	-.07147	-1.33363	-.10127

post-disclosure period was defined as the period between July, 1974 and June, 1977. The market model was then used to estimate the market risk measure over these two 36-month periods for each of the lessees in Samples 3 and 4. Summary statistics of the results obtained from this analysis are presented in Table IV-13. Again, the data indicate no significant difference in the population distribution of the market risk measure during the pre- and post-disclosure periods. Thus, this analysis provides further evidence which indicates that the disclosure of lease information did not have an adverse economic impact upon the lessee.

III. SUMMARY

In this chapter, the results obtained from this research undertaking were analyzed. The hypotheses developed in Chapter III were tested. In general, it was concluded that there was no evidence to support the view that (a) lease capitalization is relevant in making investment decisions, and (b) the disclosure of lease information had an adverse economic consequence upon the lessee.

In the next chapter a summary of the study and major conclusions drawn from the results reported in this chapter will be presented. Some limitations of the methodologies employed in this study as well as suggestions for future research will also be discussed.

TABLE IV-13. Changes in the level of the market risk measure from the pre- to post-disclosure period--excluding the effects of market reaction to the disclosure of lease information.

Sample	b _{1A}		b _{2A}		Change in mean	t value	Change in median		
	Mean	Standard deviation	Mean	Standard deviation					
3 (N = 43)	1.15032	.45779	1.08330	1.09983	.35663	.93090	-.50050	-.57065	-.14430
4 (N = 89)	1.06060	.34614	1.01270	.97700	.35909	.93090	-.08360	-1.57240	-.08180

NOTE: b_{1A} covers the period between January, 1968 and December, 1970.

b_{2A} covers the period between July, 1974 and June, 1977.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this final chapter is to provide a summary of the background, methodologies and results of this research undertaking. Some major conclusions, limitations of the study, and suggestions for future research are also discussed.

I. BACKGROUND AND OBJECTIVES

Background

Accounting for leases has been a subject of an extensive debate in the accounting and finance literature for over a quarter of a century. One of the issues that were widely discussed was whether or not long-term noncancelable leases should be capitalized, i.e., presented in the body of the financial statements. Proponents of lease capitalization argued that the capitalization would improve comparability of financial position and results of operations among firms and that leases were essentially a form of debt. Opponents, on the other hand, contended that leases did not have characteristics common to debt and that lease capitalization would impair the ability of firms to raise additional capital.

Several pronouncements on lease accounting had been promulgated by the accounting standard-setting bodies. The most recent ones included Statement of Financial Accounting Standards (SFAS) No. 13 of the Financial Accounting Standards Board (FASB) and Accounting Series

Release (ASR) No. 225 issued by the Securities and Exchange Commission (SEC). The basic requirements of SFAS 13 were that capital leases be capitalized and that operating leases be disclosed in the footnotes to the financial statements. These rules, however, would not become retroactively effective until after 1980. Because of this permitted delay in the application of SFAS 13, the SEC issued ASR 225 which required that SFAS 13 be adopted by firms filing their annual reports with the SEC after December 24, 1978.

Whether the new capitalization rule of SFAS 13 would have any discernible impact upon investment decisions was a basic question addressed by this study. In 1973, the Accounting Principles Board (APB) and the SEC published two separate pronouncements which required a comprehensive disclosure of lease information. One of the requirements of the SEC's pronouncement (ASR 147) was that lessees disclose the present value and net income effect associated with their financing leases. An analysis of the characteristics of financing and capital leases indicated that the two types of leases were essentially the same. Thus, it was asserted that an investigation dealing with financing leases would have direct implications for the SFAS 13 requirements. This assertion served as a justification for undertaking this study.

Objectives

This study had two objectives which are separately discussed below.

(1) Relevance of lease capitalization. The study's first objective was to determine the relevance of lease capitalization in making investment decisions. The criterion used in judging whether or

not the capitalization was relevant was derived from portfolio theory. Specifically, it was contended that lease capitalization would be regarded as being relevant only if it produced a set of accounting risk measures that were more closely associated with the market risk measure than a corresponding set of accounting risk measures calculated from financial statement data. The basic argument for employing this criterion was that the market risk measure, according to portfolio theory, was the appropriate measure of a security's riskiness which related directly to investment decisions. Consequently, an accounting method that produced the set of accounting data most useful in determining the market risk measure would be preferable over its alternatives.

(2) Economic impact of the disclosure of lease information. The second objective of the study was to provide evidence concerning the economic consequence of disclosing lease information. The assertion that lease capitalization would impair the firm's ability to raise capital provided impetus for this part of the investigation. Since a higher risk meant a higher cost of equity capital for the firm, and since the market risk measure measured the riskiness of the firm's security, it was argued that any effect on the market risk measure would directly influence the firm's financing ability. Therefore, if it was found that the level of the market risk measure of the lessee's common stock increased significantly from the pre- to post-disclosure period, a conclusion could be made that the disclosure of lease capitalization had an adverse economic impact on the lessee.

II. METHODOLOGIES

Relevance of Lease Capitalization

(1) Hypotheses. The relevance of capitalizing two types of leases (i.e., financing and all noncancelable leases) in making investment decisions was examined. More precisely, it was hypothesized that (a) the capitalization of financing leases was relevant, (b) the capitalization of all noncancelable leases was relevant, and (c) the capitalization of financing leases was not as relevant as the capitalization of all noncancelable leases.

(2) Sample design and computation of the variables. To test the hypotheses concerning the relevance of lease capitalization, two samples of New York Stock Exchange (NYSE) firms were selected. Fifty-eight lessee firms from three industries which were known to use leasing extensively made up the first sample (Sample 1). The second sample, Sample 2, consisted of 106 lessee firms drawn from a subpopulation of 245 NYSE lessee firms. These firms represented 49 industries and thus broadened the generalizability of the empirical results obtained.

For each sample firm, three sets of six accounting risk measures including dividend payout, asset growth, leverage, liquidity, asset size, and standard deviation of earnings were computed. The Set 1 accounting risk measures were based on reported accounting data for 1973 through 1976 obtained from the COMPUSTAT tape. From additional data collected through financial statements and 10-K reports the Set 1 accounting risk measures were adjusted to reflect the effect of (a) capitalizing financing leases (designated as Set 2 accounting risk

measures), and (b) capitalizing all noncancelable leases (designated as Set 3 accounting risk measures).

Using stock price data obtained from the CRSP tape for the period from January, 1973 through December, 1977 and the market model, an estimate of the market risk measure was computed for each sample firm.

(3) Hypothesis testing procedure. Both Sample 1 and Sample 2 were further divided into two sub-samples of the same size, i.e., Sub-sample 1A and Sub-sample 1B had 29 firms each; Sub-sample 2A and Sub-sample 2B had 53 firms each. Within each sub-sample, the Spearman rank correlation procedure was used to measure the level of association between the three sets of accounting risk measures and the market risk measure. This procedure produced three Spearman rank correlation coefficients (r_s 's) for each sub-sample. A series of intra-sample comparisons were then made between an r_s in one sub-sample (control group) and a different r_s in the other sub-sample (experimental group). This method allowed each sub-sample to serve as a control group at one time and as an experimental group at the other time. More specifically, the following analyses were made:

1. To determine whether the capitalization of financing leases was relevant in making investment decisions, the r_s 's between Set 2 accounting risk measures and the market risk measure in the experimental group were compared with the r_s 's between Set 1 accounting risk measures in the control group.

2. To determine whether the capitalization of all noncancelable leases was relevant in making investment decisions, the r_s 's between

Set 3 accounting risk measures and the market risk measure in the experimental group were compared with the r_s 's between Set 1 accounting risk measures and the market risk measure in the control group.

3. To determine whether the capitalization of one type of leases was more relevant in making investment decisions than the capitalization of the other type of leases the r_s 's between Set 2 accounting risk measures and the market risk measure in the experimental group were compared with the r_s 's between Set 3 accounting risk measures and the market risk measure in the control group.

The testing procedure described above was based on a contention that if lease capitalization was relevant in making investment decisions it should consistently produce a set of accounting risk measures that were significantly more closely associated with the market risk measure than another set of accounting risk measures computed from reported accounting data.

(4) Results. A preliminary examination of the calculated accounting risk measures indicated that lease capitalization only have a discernible impact on three of the six accounting risk measures investigated in the study. The influence of lease capitalization on the asset growth, leverage, and liquidity variables was noticeable whereas a negligible effect was found for the dividend payout, asset size and earnings variability variables. It was also noted that the means of the six accounting risk measures for the two sub-samples within each sample were approximately equal, thus, indicating that there was no bias in the technique used in assigning firms to a sub-sample.

An examination of the calculated market risk measure values was also made. It was found that the average values of the market risk in all four sub-samples were close to one. This result indicated that the samples studied were representative of the NYSE firms. It was also found that the average values of the market risk measure for the two sub-samples in each sample were about equal. This finding provided additional evidence that the two sub-samples in each sample were divided unbiasedly.

Following the hypothesis testing procedure described earlier, R. A. Fisher's test of significant difference between two observed correlation coefficients was employed to determine whether each pair of r_s 's were significantly different. Except for the measures of earnings variability relating to Sub-samples 1A and 1B, none of the differences between the r_s 's compared were found to be statistically significant. Furthermore, the significant differences found for the measures of earnings variability in Sub-samples 1A and 1B were not consistent, i.e., the differences were both positive and negative. Therefore, all of the hypotheses concerning the relevance of lease capitalization were rejected. More precisely, there was no evidence that either capitalizing financing leases or capitalizing all noncancelable leases would be relevant in making investment decisions.

A further analysis of the accounting risk measures computed was made to find a reason for obtaining the above results. The r_s 's among the three sets of accounting risk measures were calculated for the two samples. Results indicated that in each sample the three sets of accounting risk measures were extremely highly correlated. This

phenomenon provided an explanation as to why the Set 2 and Set 3 accounting risk measures did not generate a set of accounting risk measures that would show a different level of association with the market risk measure than the Set 1 accounting risk measures.

Economic Impact of Lease Information Disclosure

(1) Hypothesis. If the lease information disclosure had an adverse economic consequence upon lessees, the observed level of the market risk measure should increase after the disclosure was made. Accordingly, it was hypothesized that the level of the market risk measure during the post-disclosure period was significantly greater than the level of the market risk measure during the pre-disclosure period.

(2) Sample design and computation of the variables. To test this hypothesis, an estimate of the market risk measure during the period from January, 1968 to December, 1972 was computed for the 58 firms in Sample 1 and the 106 firms in Sample 2. After eliminating those firms whose stock price data were not available on the CRSP tape for the entire 60-month pre-disclosure period, 43 firms from Sample 1 (these firms made up Sample 3) and 89 firms from Sample 2 remained (these firms made up Sample 4). The estimate of the market risk measure used in determining the relevance of lease capitalization was considered the post-disclosure market risk measure.

(3) Hypothesis testing procedure. To test the hypothesis stated above, the Student t -test of significant difference between two means was employed. The difference between the medians of the pre- and post-disclosure distribution of the market risk measure was also examined.

(4) Results. Instead of observing an increase in the level of the market risk measure from the pre- to post-disclosure period, it was found that the level of the market risk measure actually decreased between these two periods. This decrease, however, was not significant. The median of the distribution of the market risk measure also decreased, thus, indicating that the distribution became smaller in the post-disclosure period than it was in the pre-disclosure period. Therefore, there was no evidence that the disclosure of lease capitalization had an economic impact on lessees.

III. CONCLUSIONS AND IMPLICATIONS

This research undertaking has attempted to determine the impact of lease capitalization upon investment decisions. Based on the methodologies employed and results obtained, the following conclusions and the implications relating to them can be made.

(1) Capitalization of financing leases. A first conclusion that can be drawn from the results obtained in this study is that the capitalization of financing (capital) leases is not relevant in making investment decisions. Since the accounting standard-setting authorities (the FASB and the SEC) appear to have determined that the appropriate method for reporting financing leases is capitalization, this finding has direct implications for the capitalization requirement. Lessees will soon be reporting their financing leases in the bodies of the financial statements, but results obtained from this study indicate that this new set of accounting data would not have a significant effect upon investment decisions. This conclusion by no means implies that

financing leases should or should not be capitalized. Rather it points out that the debate over lease accounting over the years may have been overemphasized.

(2) Capitalization of all noncancelable leases. Similar results were obtained when all noncancelable leases (which include financing leases) were capitalized, i.e., the capitalization of all noncancelable leases is not relevant in making investment decisions. This finding implies that even if all noncancelable leases were to be capitalized, the capitalization would not significantly affect investment decisions. Those who have been arguing for the capitalization of all noncancelable leases should be interested in the implications of this conclusion. Again, based on the result obtained, the controversy over lease accounting may have been overdone by both sides.

(3) Financing versus all noncancelable leases. By establishing certain criteria for classifying leases into capital and operating leases, the accounting standard-setting bodies seem to have decided that leases are different and should be treated differently. This study concludes that neither the capitalization of financing leases nor the capitalization of all noncancelable leases is relevant in making investment decisions and that the capitalization of one type of leases is not more relevant than the capitalization of the other type of leases. Therefore, in using accounting risk measures to help make investment decisions, investors would find that the distinction between the two types of leases is superfluous.

(4) Economic impact of lease information disclosure. One of the major reasons that contribute to the difficulty and delay in the

promulgation of accounting principles for leases is the claim that lease capitalization would adversely affect the lessee's financing activity. For firms seeking capital from the stock market, results of this research do not provide evidence that would support this contention. The disclosure of lease information in 1973 was not found to have had an adverse impact upon the lessee. Thus, based on the assumption that the market is efficient in terms of the lease information disclosed, it can be concluded that the capitalization of capital leases in compliance with SFAS 13 would not have any discernible influence upon the investor's perception of the riskiness of the lessee's common stock.

IV. LIMITATIONS

The above conclusions are subject to certain limitations inherent in the methodologies used in this study. Some of these limitations can be enumerated as follows:

1. The study deals with firms whose securities are traded on the NYSE. These firms are larger and older corporations relative to firms on other exchanges. Therefore, the findings discussed above may not be generalizable to small firms.
2. Some of the variables needed to compute the accounting risk measures had to be estimated from the disclosed lease information. The computation of the present value of other noncancelable leases, for example, was based on certain assumptions. The accuracy of this computation would depend on the validity of the assumption used.
3. The calculation of the market risk measure was based on the market model. Some recent work (see Dyckman, Downes, and Magee [1975])

has questioned the validity of this model for estimating the market risk measure. Furthermore, the use of the association criterion as a basis for evaluating accounting alternatives has been challenged [May and Sundem, 1973; Downes and Dyckman, 1973]. However, it is a contention of this study that the use of the association criterion has produced results concerning the relationship between lease capitalization and investment decision-making process that was not previously available.

4. The final and most important limitation of this research is the underlying methodology used in this study to investigate the relevance of lease capitalization in making investment decisions. The ranking method used is a nonparametric method which can provide information relating to only the relative position (ranking) of individual observations. Because of the observed high correlations among the three sets of accounting risk measures, it cannot be determined whether or not the lease information was impounded in the market risk measure. Thus a question as to whether or not investors regard lease commitments as a form of debt and consider these commitments in establishing the level of a security's riskiness cannot be answered from the results obtained from this research undertaking.

V. SUGGESTIONS FOR FUTURE RESEARCH

There still remain a number of questions relating to the lease issue that warrant an investigation. Following are some of the more important areas.

1. Research based on a parametric technique (e.g., multiple regression procedure) may be undertaken to determine if the disclosed

lease information is impounded in the market risk measure. Using such technique a theoretical model can be constructed and tested with the lease data. However, the researcher should be aware of the problem of multicollinearity between leases and debt of lessees.

2. The high correlations among the three sets of accounting risk measures examined in this study was not expected at the beginning of the research process. This phenomenon raises a behavioral question concerning the combination of debt and leases by the firms. Specifically, why firms with a large amount of debt also use a large amount of lease, and vice versa, is an interesting question that should be investigated. This phenomenon also raises some doubts as to the claim that leases and debt are equivalent, because if this is true a random combination of leases and debt should have been observed. Research designed to provide further insight into this question is appropriate.

3. Another area that may be appropriate for future research is an extension of this study to other smaller firms. These firms are more likely to be adversely affected by the capitalization requirements. Only anecdotal evidence is available indicating that some firms are actually rewriting their lease contracts to avoid having to show the leases on their financial statements. Some form of hard evidence relating to this activity would be an important contribution to the literature on lease accounting.

4. A final recommendation for future research would be to replicate this study using the data to be provided by SFAS 13 and ASR 225. Such a project will have to wait until sufficient observation points (say, four years) become available. With the data to be

provided in the 10-K reports in compliance with ASR 255 the research would become possible after 1982. This project would answer questions concerning the actual capitalization of leases and the actual impact of the SFAS 13 requirements.

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APPENDICES

APPENDIX A

SUMMARY OF RELEVANT STATISTICS

TABLE A-1. Calculated post-disclosure market risk measures (b_2)--
Sub-sample 1A.

Industry code	Company's name	b_2	Rank
4511	American Airlines, Inc.	1.28399	20
4511	Continental Air Lines, Inc.	1.52693	26
4511	Eastern Air Lines	1.46501	23
4511	North Central Airlines, Inc.	1.10903	16
4511	PSA, Inc.	1.34116	21
4511	Seaboard World Airlines	1.67027	28
4511	Trans World Airlines	1.71735	29
4511	Western Air Lines, Inc.	1.26875	19
5311	Alexander's, Inc.	1.63378	27
5311	Ames Dept. Stores, Inc.	1.49164	24
5311	Arlen Realty & Development	1.50661	25
5311	Carter Hawley Hale Stores	0.99732	12
5311	Dayton-Hudson Corp.	0.98662	11
5311	Gamble-Skogmo	0.64785	3
5311	Macy (R.H.) and Co.	1.09411	15
5311	May Department Stores Co.	0.97794	10
5311	Outlet Co.	1.08363	14
5311	Penney (J.C.) Co.	0.88212	8
5311	Sears, Roebuck & Co.	0.70401	4
5311	Wal-Mart Stores	1.45495	22
5411	Albertson's, Inc.	0.53046	1
5411	American Stores Co.	0.93630	9
5411	Colonial Stores, Inc.	0.70964	5
5411	Fisher Foods, Inc.	1.07470	13
5411	Great Atlantic & Pac. Tea Co.	0.74024	6
5411	Lucky Stores, Inc.	0.84008	7
5411	National Tea Co.	1.22265	17
5411	Safeway Stores, Inc.	0.58231	2
5411	Supermarkets General Corp.	1.24496	18

NOTE: Industry code: 4511 = Airline industry;
5311 = Retail department stores industry;
5411 = Retail grocery stores industry.

TABLE A-2. Calculated dividend payout ratios--Sub-sample 1A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
American Airlines, Inc.	0.00000	4.5	0.00000	4.5	0.00000	4.5
Continental Air Lines, Inc.	0.00000	4.5	0.00000	4.5	0.00000	4.5
Eastern Air Lines	0.00000	4.5	0.00000	4.5	0.00000	4.5
North Central Airlines, Inc.	0.15724	11.0	0.15724	11.0	0.15724	11.0
PSA, Inc.	0.00000	4.5	0.00000	4.5	0.00000	4.5
Seaboard World Airlines	0.00000	4.5	0.00000	4.5	0.00000	4.5
Trans World Airlines	0.00000	4.5	0.00000	4.5	0.00000	4.5
Western Air Lines, Inc.	0.33850	21.0	0.35706	21.0	0.36158	21.0
Alexander's, Inc.	0.31386	20.0	0.34280	20.0	0.34672	20.0
Ames Dept. Stores, Inc.	0.08469	10.0	0.09614	10.0	0.09663	10.0
Arden Realty & Development	0.00000	4.5	0.00000	4.5	0.00000	4.5
Carter Hawley Hale Stores	0.41954	24.0	0.43124	24.0	0.43684	24.0
Dayton-Hudson Corp.	0.25908	15.0	0.25908	13.0	0.25908	13.0
Gamble-Skogmo	0.28510	17.0	0.28510	15.0	0.28510	15.0
Macy (R.H.) & Co.	0.30774	19.0	0.30774	17.0	0.30774	17.0
May Department Stores Co.	0.42112	25.0	0.42038	23.0	0.42038	22.0
Outlat Co.	0.25015	14.0	0.25976	14.0	0.26017	14.0
Penney (J.C.) Co.	0.39003	22.0	0.41578	22.0	0.42083	23.0
Sears, Roebuck & Co.	0.46200	27.0	0.46332	26.0	0.46400	26.0
Wal-Mart Stores	0.07403	9.0	0.07717	9.0	0.07821	9.0
Albertson's, Inc.	0.28169	16.0	0.30489	16.0	0.30528	16.0
American Stores Co.	0.29899	18.0	0.31809	19.0	0.32480	19.0
Colonial Stores, Inc.	0.41943	23.0	0.43361	25.0	0.44837	25.0
Fisher Foods, Inc.	0.18184	12.0	0.19089	12.0	0.19175	12.0
Great Atlantic & Pac. Tea Co.	1.00000	29.0	1.00000	29.0	1.00000	29.0
Lucky Stores, Inc.	0.50857	28.0	0.53520	28.0	0.53871	28.0
National Tea Co.	0.00000	4.5	0.00000	4.5	0.00000	4.5
Safeway Stores, Inc.	0.44084	26.0	0.47019	27.0	0.47651	27.0
Supermarkets General Corp.	0.24139	13.0	0.30890	18.0	0.30890	18.0

TABLE A-3. Calculated asset growth variables--Sub-sample 1A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
American Airlines, Inc.	-0.00250	4	0.091004	9	0.095137	7
Continental Air Lines, Inc.	0.03769	8	0.037692	4	0.067496	3
Eastern Air Lines	0.00913	7	0.127784	17	0.170732	19
North Central Airlines, Inc.	0.13863	25	0.174459	21	0.180824	20
PSA, Inc.	-0.08243	2	-0.016289	2	-0.006083	1
Seaboard World Airlines	-0.01398	3	0.068152	6	0.077709	5
Trans World Airlines	0.04227	10	0.116643	15	0.137184	16
Western Air Lines, Inc.	0.05751	12	0.118358	16	0.129234	13
Alexander's, Inc.	0.00731	6	0.067711	5	0.075681	4
Ames Dept. Stores, Inc.	0.17453	27	0.331609	27	0.335606	27
Arlen Realty & Development	0.08711	18	0.110893	13	0.120565	12
Carter Hawley Hale Stores	0.09379	19	0.170360	20	0.206134	22
Dayton-Hudson Corp.	0.07385	13	0.082208	7	0.105302	9
Gamble-Skogmo	0.08119	15	0.102459	11	0.118215	11
Macy (R.H.) & Co.	0.08225	16	0.112368	14	0.112368	10
May Department Stores Co.	0.08680	17	0.103891	12	0.103891	8
Outlet Co.	0.11633	22	0.167837	19	0.169194	18
Penney (J.C.) Co.	0.12024	23	0.183323	23	0.209022	23
Sears, Roebuck & Co.	0.07742	14	0.084384	8	0.087810	6
Wal-Mart Stores	0.26442	29	0.349867	29	0.365196	29
Albertson's, Inc.	0.21142	28	0.345915	28	0.346455	28
American Stores Co.	0.10589	21	0.187488	22	0.196135	21
Colonial Stores, Inc.	0.04190	9	0.095757	10	0.134965	15
Fisher Foods, Inc.	0.15554	26	0.225700	26	0.230656	25
Great Atlantic & Pac. Tea Co.	0.00583	5	0.032190	3	0.131474	14
Lucky Stores, Inc.	0.12800	24	0.222317	25	0.231241	26
National Tea Co.	-0.11690	1	-0.054292	1	-0.003375	2
Safeway Stores, Inc.	0.10179	20	0.213690	24	0.225743	24
Supermarkets General Corp.	0.05151	11	0.147494	18	0.147494	17

TABLE A-4. Calculated leverage ratios---Sub-sample 1A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
American Airlines, Inc.	0.554110	12	0.694880	17	0.699700	16
Continental Air Lines, Inc.	0.709903	25	0.726246	20	0.738147	20
Eastern Air Lines	0.758005	27	0.843006	28	0.851477	28
North Central Airlines, Inc.	0.605320	20	0.686340	15	0.696733	15
PSA, Inc.	0.482401	6	0.580190	6	0.592742	5
Seaboard World Airlines	0.636916	21	0.736646	24	0.750567	23
Trans World Airlines	0.773975	28	0.841232	27	0.849486	27
Western Air Lines, Inc.	0.541969	11	0.627620	9	0.642946	8
Alexander's, Inc.	0.597425	18	0.672309	14	0.679590	13
Ames Dept. Stores, Inc.	0.396592	1	0.709413	19	0.714938	17
Arlen Realty & Development	0.894651	29	0.905557	29	0.910633	29
Carter Hawley Hale Stores	0.587116	17	0.692866	16	0.734244	19
Dayton-Hudson Corp.	0.566651	15	0.582730	7	0.620834	7
Gamble-Skogmo	0.698592	24	0.727006	21	0.744680	22
Macy (R.H.) & Co.	0.513969	9	0.574798	5	0.574798	3
May Department Stores Co.	0.554200	13	0.591573	8	0.591573	4
Outlet Co.	0.578416	16	0.652807	12	0.655322	9
Penney (J.C.) Co.	0.442663	3	0.561153	4	0.572099	2
Sears, Roebuck & Co.	0.523220	10	0.537532	3	0.544471	1
Wal-Mart Stores	0.491652	7	0.637081	10	0.672089	11
Albertson's, Inc.	0.562866	14	0.731653	23	0.733677	18
American Stores Co.	0.513341	8	0.644354	11	0.672358	12
Colonial Stores, Inc.	0.413541	2	0.524952	2	0.599281	6
Fisher Foods, Inc.	0.691680	23	0.765403	25	0.770962	25
Great Atlantic & Pac. Tea Co.	0.458570	4	0.497909	1	0.661076	10
Lucky Stores, Inc.	0.598b98	19	0.727927	22	0.738473	21
National Tea Co.	0.638887	22	0.696587	18	0.758094	24
Safeway Stores, Inc.	0.478579	5	0.670606	13	0.693165	14
Supermarkets General Corp.	0.729767	26	0.819695	26	0.819695	26

TABLE A-5. Calculated current ratios--Sub-sample 1A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
American Airlines, Inc.	1.17445	7	0.96739	4	0.95450	7
Continental Air Lines, Inc.	0.76704	1	0.74919	1	0.72860	1
Eastern Air Lines	0.98899	3	0.98899	5	0.76900	2
North Central Airlines, Inc.	1.11466	5	1.11466	8	0.93592	6
PSA, Inc.	1.59655	17	1.30907	13	1.25930	14
Seaboard World Airlines	1.35601	9	1.09403	7	0.91831	5
Trans World Airlines	1.13023	6	0.94618	3	0.91233	4
Western Air Lines, Inc.	0.97750	2	0.87825	2	0.85264	3
Alexander's, Inc.	2.16395	24	1.92058	23	1.87125	24
Ames Dept. Stores, Inc.	3.52739	29	2.34243	29	2.24748	29
Arlen Realty & Development	1.08615	4	0.99480	6	0.96109	8
Carter Hawley Hale Stores	2.30848	27	2.30848	28	1.94040	27
Dayton-Hudson Corp.	1.90377	21	1.87703	22	1.79210	23
Gamble-Skogmo	1.93518	22	1.84464	21	1.77383	22
Macy (R.H.) & Co.	1.45684	12	1.37670	16	1.37670	18
May Department Stores Co.	2.08158	23	2.00284	26	2.00284	28
Outlet Co.	2.25726	26	1.95159	24	1.93046	26
Penney (J.C.) Co.	1.77624	20	1.63413	20	1.60718	20
Sears, Roebuck & Co.	1.55001	16	1.55001	18	1.52679	19
Wal-Mart Stores	2.32799	28	2.04391	27	1.92159	25
Albertson's, Inc.	1.45923	13	1.23125	11	1.22313	12
American Stores Co.	1.62855	19	1.46541	17	1.37547	17
Colonial Stores, Inc.	2.22521	25	2.00089	25	1.72819	21
Fisher Foods, Inc.	1.42491	11	1.26228	12	1.24305	13
Great Atlantic & Pac. Tea Co.	1.61691	18	1.57751	19	1.29479	16
Lucky Stores, Inc.	1.49712	15	1.31740	14	1.28591	15
National Tea Co.	1.46252	14	1.34829	15	1.19348	11
Safeway Stores, Inc.	1.37207	10	1.16496	10	1.13710	9
Supermarkets General Corp.	1.32459	8	1.14515	9	1.14515	10

TABLE A-6. Calculated asset size variables--Sub-sample 1A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
American Airlines, Inc.	7.41547	26	7.79511	26	7.81101	25
Continental Air Lines, Inc.	6.53755	17	6.59702	15	6.63974	15
Eastern Air Lines	7.21301	23	7.64505	24	7.70040	24
North Central Airlines, Inc.	4.90022	5	5.12923	4	5.16319	4
PSA, Inc.	5.15333	8	5.36454	8	5.39458	7
Seaboard World Airlines	4.82730	4	5.14533	5	5.19955	5
Trans World Airlines	7.56914	27	7.92112	27	7.97414	27
Western Air Lines, Inc.	6.00596	13	6.21324	13	6.25511	13
Alexander's, Inc.	5.09528	6	5.30082	6	5.32335	6
Ames Dept. Stores, Inc.	3.57459	1	4.30152	1	4.32063	1
Arlen Realty & Development	7.29384	24	7.40101	23	7.45560	23
Carter-Hawley Hale Stores	6.58457	18	6.88022	20	7.02748	20
Dayton-Hudson Corp.	6.82368	20	6.86150	19	6.95727	19
Gamble-Skogmo	6.52001	16	6.61919	16	6.68616	16
Macy (R.H.) & Co.	6.70353	19	6.83734	18	6.83734	18
May Department Stores Co.	7.16165	22	7.24925	22	7.24925	21
Outlet Co.	4.45679	2	4.65249	2	4.65969	2
Penney (J.C.) Co.	7.98801	28	8.22697	28	8.25267	28
Sears, Roebuck & Co.	9.34881	29	9.37928	29	9.39440	29
Wal-Mart Stores	4.47893	3	4.81595	3	4.91760	3
Albertson's, Inc.	5.23917	9	5.72521	10	5.73294	10
American Stores Co.	6.21671	14	6.53162	14	6.61372	14
Colonial Stores, Inc.	5.14072	7	5.35107	7	5.52143	8
Fisher Foods, Inc.	5.53222	11	5.80458	11	5.82843	11
Great Atlantic & Pac. Tea Co.	6.92577	21	7.00430	21	7.39616	22
Lucky Stores, Inc.	6.30460	15	6.69266	17	6.73220	17
National Tea Co.	5.33011	10	5.50429	9	5.73066	9
Safeway Stores, Inc.	7.32835	25	7.78766	25	7.85898	26
Supermarkets General Corp.	5.76307	12	6.16818	12	6.16818	12

TABLE A-7. Calculated measures of earnings variability--Sub-sample 1A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
American Airlines, Inc.	0.081725	20	0.084419	21	0.084651	21
Continental Air Lines, Inc.	0.081089	19	0.082515	20	0.082520	20
Eastern Air Lines	0.265024	28	0.298418	28	0.293065	28
North Central Airlines, Inc.	0.035931	13	0.035931	13	0.035931	13
PSA, Inc.	0.198391	25	0.203986	26	0.204170	25
Seaboard World Airlines	0.063406	17	0.063726	18	0.063492	18
Trans World Airlines	0.367380	29	0.397278	29	0.399728	29
Western Air Lines, Inc.	0.027009	9	0.027686	10	0.027771	10
Alexander's, Inc.	0.094122	22	0.090321	22	0.090017	22
Ames Dept. Stores, Inc.	0.116238	23	0.107145	23	0.106930	23
Arlen Realty & Development	0.227969	27	0.229777	27	0.231304	27
Carter Hawley Hale Stores	0.026746	8	0.024948	8	0.024438	8
Dayton-Hudson Corp.	0.082160	21	0.082160	19	0.082160	19
Gamble-Skogmo	0.018935	3	0.018935	3	0.018935	3
Macy (R.H.) & Co.	0.061128	16	0.061128	17	0.061128	17
May Department Stores Co.	0.030832	11	0.030740	11	0.030740	11
Outlet Co.	0.059100	15	0.057333	15	0.057281	15
Penney (J.C.) Co.	0.014328	2	0.013346	2	0.013145	2
Sears, Roebuck & Co.	0.008520	1	0.008494	1	0.008481	1
Wal-Mart Stores	0.032819	12	0.031250	12	0.030848	12
Albertson's, Inc.	0.022868	5	0.021310	5	0.021300	5
American Stores Co.	0.041384	14	0.040227	14	0.039796	14
Colonial Stores, Inc.	0.024493	7	0.023794	7	0.023069	7
Fisher Foods, Inc.	0.027356	10	0.025371	9	0.025302	9
Great Atlantic & Pac. Tea Co.	0.191787	24	0.190943	24	0.187491	24
Lucky Stores, Inc.	0.023342	6	0.022218	6	0.022067	6
National Tea Co.	0.199503	26	0.202899	25	0.205963	26
Safeway Stores, Inc.	0.021041	4	0.020418	4	0.020320	4
Supermarkets General Corp.	0.067302	18	0.058741	16	0.058741	16

TABLE A-8. Calculated post-disclosure market risk measures (b_2)--
Sub-sample 1B.

Industry code	Company's name	b_2	Rank
4511	Braniff Intl. Corp.	1.50743	22
4511	Delta Air Lines, Inc.	0.85946	6
4511	National Airlines, Inc.	1.58049	27
4511	Northwest Airlines, Inc.	1.20020	19
4511	Pan American World Airways	1.62748	28
4511	Tiger International	1.37095	20
4511	UAL, Inc.	1.03864	14
4511	World Airways, Inc.	1.50840	23
5311	Allied Stores	0.99606	13
5311	AMFAC, Inc.	0.83670	5
5311	ASSD Dry Goods Corp.	0.90711	10
5311	Cook United, Inc.	1.50997	24
5311	Federated Dept. Stores, Inc.	0.98952	12
5311	King's Dept. Stores	1.14081	17
5311	Marshall Field & Co.	0.89565	8
5311	Mercantile Stores Co., Inc.	1.06893	15
5311	Pamida, Inc.	1.84571	29
5311	SCOA Inds., Inc.	0.94898	11
5311	Vornado, Inc.	1.56501	26
5311	Wieboldt Stores, Inc.	0.90438	9
5411	Allied Supermarkets	1.46365	21
5411	Borman's, Inc.	1.54569	25
5411	Dillon Cos.	0.64620	1
5411	Food Fair, Inc.	0.71694	2
5411	Kroger Co.	0.87989	7
5411	Munford, Inc.	1.19786	18
5411	Pueblo Intl., Inc.	1.11176	16
5411	Stop & Shop Cos.	0.78748	4
5411	Weis Markets, Inc.	0.72426	3

NOTE: Industry code: 4511 = Airline industry;
5311 = Retail department stores industry;
5411 = Retail grocery stores industry.

TABLE A-9. Calculated dividend payout ratios--Sub-sample 1B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	0.12055	7	0.13258	7.0	0.13347	7.0
Delta Air Lines, Inc.	0.16556	8	0.16556	8.0	0.16556	8.0
National Airlines, Inc.	0.20686	12	0.22309	12.0	0.22490	12.0
Northwest Airlines, Inc.	0.18354	10	0.18354	10.0	0.18354	10.0
Pan American World Airways	0.00000	3	0.00000	3.0	0.00000	3.0
Tiger International	0.21174	13	0.23195	13.0	0.23334	13.0
UAL, Inc.	0.27177	16	0.32899	18.0	0.33132	18.0
World Airways, Inc.	0.00000	3	0.00000	3.0	0.00000	3.0
Allied Stores	0.28268	17	0.29231	16.0	0.29400	17.0
Amfac, Inc.	0.25052	15	0.25954	15.0	0.26316	15.0
Assd. Dry Goods Corp.	0.45709	25	0.45702	24.0	0.45702	24.0
Cook United, Inc.	1.77523	29	1.00000	28.5	1.00000	28.5
Federated Dept. Stores, Inc.	0.39454	23	0.39454	23.0	0.39454	22.0
King's Dept. Stores	0.32082	20	0.33073	19.0	0.33380	19.0
Marshall Field & Co.	0.57041	27	0.57041	27.0	0.57041	26.0
Mercantile Stores Co., Inc.	0.18102	9	0.18102	9.0	0.18102	9.0
Pamida, Inc.	0.08120	6	0.08582	6.0	0.08687	6.0
SCOA Inds., Inc.	0.30323	19	0.33621	20.0	0.36614	21.0
Vornado, Inc.	0.00000	3	0.00000	3.0	0.00000	3.0
Wieboldt Stores, Inc.	0.35778	21	0.35778	21.0	0.35778	20.0
Allied Supermarkets	0.00000	3	0.00000	3.0	0.00000	3.0
Borman's, Inc.	0.00000	3	0.00000	3.0	0.00000	3.0
Dillon Cos.	0.37264	22	0.38891	22.0	0.39543	23.0
Food Fair, Inc.	0.39582	24	0.50815	26.0	0.57522	27.0
Kroger Co.	0.45859	26	0.47484	25.0	0.51695	25.0
Munford, Inc.	0.18875	11	0.20740	11.0	0.20871	11.0
Pueblo Intl., Inc.	1.00000	28	1.00000	28.5	1.00000	28.5
Stop & Shop Cos.	0.29372	18	0.29372	17.0	0.29372	16.0
Weis Markets, Inc.	0.24787	14	0.24787	14.0	0.24787	14.0

TABLE A-10. Calculated asset growth variables--Sub-sample 1B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	0.09733	21	0.165218	23	0.168264	18
Delta Air Lines, Inc.	0.15778	28	0.187335	26	0.189851	24
National Airlines, Inc.	0.00985	6	0.061992	7	0.067418	6
Northwest Airlines, Inc.	0.05601	14	0.056012	4	0.076561	7
Pan American World Airways	-0.05037	3	0.035209	3	0.041613	2
Tiger International	0.12478	24	0.169797	24	0.172117	20
UAL, Inc.	0.05066	11	0.113570	15	0.115880	13
World Airways, Inc.	-0.06569	2	0.022963	1	0.030948	1
Allied Stores	0.03959	10	0.074195	10	0.080972	9
Amfac, Inc.	0.08927	19	0.156438	19	0.176778	22
Assd. Dry Goods Corp.	0.02863	9	0.089598	12	0.089598	10
Cook United, Inc.	-0.03600	4	0.058422	6	0.060977	4
Federated Dept. Stores, Inc.	0.12427	23	0.146739	18	0.153010	15
King's Dept. Stores	0.09077	20	0.229157	27	0.261606	27
Marshall Field & Co.	0.05347	13	0.073523	9	0.079798	8
Mercantile Stores Co., Inc.	0.12876	25	0.163065	22	0.166628	17
Pamida, Inc.	0.08405	18	0.160104	21	0.171860	19
SCOA Inds., Inc.	0.05859	15	0.159396	20	0.198436	25
Vornado, Inc.	0.02302	8	0.058082	5	0.062912	5
Wieboldt Stores, Inc.	0.06282	17	0.101433	14	0.102974	12
Allied Supermarkets	0.00650	5	0.084875	11	0.089777	11
Borman's, Inc.	0.05127	12	0.179307	25	0.188806	23
Dillon Cos.	0.19794	29	0.276819	29	0.308643	29
Food Fair, Inc.	0.02234	7	0.099528	13	0.139571	14
Kröger Co.	0.10495	22	0.141330	16	0.206331	26
Munford, Inc.	0.14641	27	0.255380	28	0.262924	28
Pueblo Intl., Inc.	-0.10810	1	0.029431	2	0.0043667	3
Stop & Shop Cos.	0.06241	16	0.062407	8	0.172253	21
Weis Markets, Inc.	0.13451	26	0.146299	17	0.160505	16

TABLE A-11. Calculated leverage ratios--Sub-sample 1B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	0.634582	21	0.725074	20	0.729418	19
Delta Air Lines, Inc.	0.422811	10	0.508579	6	0.514451	6
National Airlines, Inc.	0.480397	11	0.575884	10	0.583840	10
Northwest Airlines, Inc.	0.325690	5	0.357294	3	0.375140	3
Pan American World Airways	0.758193	28	0.817900	28	0.822627	28
Tiger International	0.684671	27	0.732932	21	0.735589	20
UAL, Inc.	0.581417	16	0.682113	19	0.684646	17
World Airways, Inc.	0.296916	3	0.513455	7	0.528404	8
Allied Stores	0.607579	18	0.670017	17	0.678730	16
Amfac, Inc.	0.574566	15	0.670983	18	0.697262	18
Assd. Dry Goods Corp.	0.397449	9	0.524242	8	0.524242	7
Cook United, Inc.	0.618185	20	0.735138	23	0.738042	21
Federated Dept. Stores, Inc.	0.369188	7	0.427293	4	0.440121	4
King's Dept. Stores	0.211032	2	0.581882	12	0.629293	12
Marshall Field & Co.	0.309082	4	0.351112	2	0.365977	2
Mercantile Stores Co., Inc.	0.367874	6	0.445882	5	0.454657	5
Pamida, Inc.	0.394330	8	0.529597	9	0.550334	9
SCOA Inds., Inc.	0.638014	23	0.760191	24	0.806236	27
Vornado, Inc.	0.615023	19	0.659971	16	0.664586	13
Wieboldt Stores, Inc.	0.546231	14	0.616914	13	0.619629	11
Allied Supermarkets	0.762945	29	0.832216	29	0.834339	29
Borman's, Inc.	0.636858	22	0.776345	26	0.795323	26
Dillon Cos.	0.503125	12	0.644383	14	0.677949	15
Food Fair, Inc.	0.668148	26	0.764936	25	0.792958	25
Kroger Co.	0.513253	13	0.579451	11	0.677792	14
Munford, Inc.	0.647422	24	0.785782	27	0.790177	24
Pueblo Intl., Inc.	0.595435	17	0.735120	22	0.747900	22
Stop & Shop Cos.	0.655833	25	0.655833	15	0.774706	23
Weis Markets, Inc.	0.158100	1	0.206364	1	0.249013	1

TABLE A-12. Calculated current ratios--Sub-sample 1B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	1.17111	4	0.91650	3	0.88774	3
Delta Air Lines, Inc.	0.86266	2	0.76560	1	0.74409	1
National Airlines, Inc.	1.22240	5	1.05278	5	1.02378	6
Northwest Airlines, Inc.	0.85324	1	0.81576	2	0.79279	2
Pan American World Airways	1.14487	3	0.96375	4	0.94486	4
Tiger International	1.63149	13	1.24892	9	1.22822	9
UAL, Inc.	1.57938	10	1.30193	11	1.28971	11
World Airways, Inc.	2.25613	23	1.64974	17	1.62413	19
Allied Stores	2.25634	24	2.09282	24	2.06534	24
Amfac, Inc.	1.97562	19	1.83099	20	1.74325	21
Assd. Dry Goods Corp.	2.21147	22	1.98010	22	1.98010	23
Cook United, Inc.	1.92842	17	1.64129	16	1.62179	18
Federated Dept. Stores, Inc.	1.79320	16	1.79320	19	1.71328	20
King's Dept. Stores	5.62858	29	5.62858	29	2.84810	28
Marshall Field & Co.	2.39439	25	2.39439	25	2.29509	25
Mercantile Stores Co., Inc.	2.63648	26	2.44957	26	2.41219	26
Pamida, Inc.	3.08271	27	2.73250	27	2.63272	27
SCOA Inds., Inc.	2.07806	21	1.79212	18	1.53626	17
Vornado, Inc.	1.97077	18	1.83253	21	1.79787	22
Wieboldt Stores, Inc.	1.67358	15	1.54035	13	1.53443	16
Allied Supermarkets	1.47136	9	1.29413	10	1.27891	10
Borman's, Inc.	1.22831	6	1.22831	8	1.01420	5
Dillon Cos.	1.31025	7	1.16578	7	1.11557	8
Food Fair, Inc.	1.61705	12	1.44247	12	1.34429	13
Kroger Co.	1.64432	14	1.55905	14	1.37435	14
Munford, Inc.	2.07766	20	2.07766	23	1.40939	15
Pueblo Intl., Inc.	1.31683	8	1.09668	6	1.05536	7
Stop & Shop Cos.	1.59685	11	1.59685	15	1.32355	12
Weis Markets, Inc.	3.84230	28	3.65857	28	3.43567	29

TABLE A-13. Calculated asset size variables--Sub-sample 1B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	6.24949	18	6.53341	19	6.54957	18
Delta Air Lines, Inc.	7.09981	26	7.26056	26	7.27261	25
National Airlines, Inc.	6.28488	19	6.48781	18	6.50661	17
Northwest Airlines, Inc.	7.04088	25	7.09150	22	7.11681	22
Pan American World Airways	7.34906	27	7.63157	28	7.65818	28
Tiger International	6.97783	23	7.14481	24	7.15471	23
UAL, Inc.	7.88020	29	8.15572	29	8.16371	29
World Airways, Inc.	5.19994	11	5.56923	11	5.60032	11
Allied Stores	6.98833	24	7.16431	25	7.19103	24
Amfac., Inc.	6.60055	20	6.85713	20	6.94042	21
Assd. Dry Goods Corp.	6.62630	21	6.86168	21	6.86168	20
Cook United, Inc.	5.29746	12	5.66324	13	5.67422	12
Federated Dept. Stores, Inc.	7.48850	28	7.58509	27	7.60775	27
King's Dept. Stores	4.41859	2	5.05266	6	5.17278	7
Marshall Field & Co.	5.84622	15	5.90917	15	5.93237	14
Mercantile Stores Co., Inc.	5.73154	14	5.86350	14	5.87949	13
Pamida, Inc.	4.46323	4	4.71566	3	4.76117	3
SCOA Inds., Inc.	4.90240	8	5.31408	8	5.53915	10
Vornado, Inc.	5.96677	16	6.09100	16	6.10476	16
Wieboldt Stores, Inc.	4.43300	3	4.60262	1	4.60975	1
Allied Supermarkets	5.16505	10	5.50827	10	5.52153	9
Borman's, Inc.	4.31416	1	4.80270	4	4.88749	4
Dillon Cos.	5.06602	9	5.40128	9	5.49942	8
Food Fair, Inc.	6.09819	17	6.44300	17	6.56979	19
Kroger Co.	6.97489	22	7.12097	23	7.38775	26
Munford, Inc.	4.48449	5	4.98133	5	5.00233	5
Pueblo Intl., Inc.	4.67474	7	5.10002	7	5.14974	6
Stop & Shop Cos.	5.64455	13	5.64455	12	6.06825	15
Weis Markets, Inc.	4.56836	6	4.62742	2	4.68268	2

TABLE A-14. Calculated measures of earnings variability--Sub-sample 1B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	0.026565	9	0.023009	8	0.022922	8
Delta Air Lines, Inc.	0.012718	1	0.012718	1	0.012718	1
National Airlines, Inc.	0.043298	13	0.042533	13	0.042502	13
Northwest Airlines, Inc.	0.022888	7	0.022888	7	0.022888	7
Pan American World Airways	0.139880	27	0.157857	27	0.160366	27
Tiger International	0.032183	12	0.026925	11	0.026813	11
UAL, Inc.	0.049038	14	0.049365	14	0.049446	14
World Airways, Inc.	0.067433	19	0.063815	19	0.063475	19
Allied Stores	0.074585	21	0.072738	21	0.072440	21
Amfac, Inc.	0.086373	24	0.086647	25	0.086835	25
Assd. Dry Goods Corp.	0.024850	8	0.024845	9	0.024845	10
Cook United, Inc.	0.139841	26	0.128043	26	0.127919	26
Federated Dept. Stores, Inc.	0.019525	5	0.019525	5	0.019525	6
King's Dept. Stores	0.026597	10	0.024890	10	0.024369	9
Marshall Field & Co.	0.016528	3	0.016528	3	0.016528	3
Mercantile Stores Co., Inc.	0.029678	11	0.029678	12	0.029678	12
Pamida, Inc.	0.054143	15	0.052298	15	0.051689	15
SCOA Inds., Inc.	0.081355	23	0.075634	23	0.077536	23
Vornado, Inc.	0.058854	16	0.058933	16	0.059287	16
Wieboldt Stores, Inc.	0.061539	18	0.061539	18	0.061539	18
Allied Supermarkets	0.282631	28	0.272017	28	0.271756	28
Borman's, Inc.	0.105359	25	0.086219	24	0.084651	24
Dillon Cos.	0.014678	2	0.013741	2	0.013386	2
Food Fair, Inc.	0.060470	17	0.059633	17	0.059361	17
Kroger Co.	0.021087	6	0.020343	6	0.018443	5
Munford, Inc.	0.078226	22	0.072217	20	0.071644	20
Pueblo Intl., Inc.	0.408442	29	0.403915	29	0.403232	29
Stop & Shop Cos.	0.073936	20	0.073936	22	0.073936	22
Weis Markets, Inc.	0.017980	4	0.017980	4	0.017980	4

TABLE A-15. Calculated post-disclosure market risk measures (b_2)--
Sub-sample 2A.

Industry code	Company's name	b_2	Rank
209219	Consolidated Foods Corp.	0.81880	19
484098	Kane-Miller Corp.	0.78092	16
99599	Borden, Inc.	0.55474	7
393046	Green Giant Co.	0.79342	17
39483	Archer-Daniels-Midland Co.	0.44054	5
860163	Stevens (J.P.) & Co.	0.73319	12
718592	Phillips Van Heusen	1.54363	50
228669	Crown Zellerbach	0.76071	15
315711	Fibreboard Corp.	0.79968	18
709317	Pennwalt Corp.	0.87996	21
852245	Squibb Corp.	0.65108	8
457659	Insilco Corp.	0.99762	26
969457	Williams Cos.	0.26766	1
718507	Phillips Petroleum Co.	0.29697	4
907770	Union Oil Co. of California	0.22876	3
216831	Cooper Tire & Rubber	1.44368	43
909160	Uniroyal, Inc.	0.99284	25
745075	Puerto Rican Cement Co., Inc.	1.27960	38
77455	Belden Corp.	0.51053	6
26573	American Hoist & Derrick Co.	1.10247	30
524462	Leesona Corp.	1.16474	33
724479	Pitney-Bowes, Inc.	1.06660	28
809367	Scott & Fetzer Co.	1.11029	31
460254	Intl. Rectifier Corp.	1.12118	32
124884	CCI Corp.	1.38484	42
338027	Fisher Scientific Co.	1.18130	34
601753	Milton Bradley Co.	1.50719	47
449268	IC Inds.	1.03013	27
835716	SOO Line Railroad	0.27683	2
276191	Eastern Air Lines	1.46501	45
886735	Tiger International	1.37095	41
981423	World Airways, Inc.	1.50840	48
252435	DI Giorgio Corp.	1.24901	37
967443	Wickes Corp.	1.29945	39
31141	AMFAC, Inc.	0.83670	20
216244	Cook United, Inc.	1.50997	49
314099	Federated Dept. Stores, Inc.	0.98952	24
577778	May Department Stores Co.	0.97794	23
690105	Outlet Co.	1.08363	29

TABLE A-15. (continued)

Industry code	Company's name	b ₂	Rank
812387	Sears, Roebuck & Co.	0.70401	9
989195	Zayre Corp.	1.90428	53
753329	Rapid-American Corp.	1.34017	40
19537	Allied Supermarkets	1.46365	44
196054	Colonial Stores, Inc.	0.70964	10
390064	Great Atlantic & Pac. Tea Co.	0.74024	13
638097	National Tea Co.	1.22265	35
948849	Weis Markets, Inc.	0.72426	11
248703	Denny's, Inc.	1.62627	51
442672	Howard Johnson Co.	1.49416	46
931422	Walgreen Co.	0.74164	14
751328	Ramada Inns	1.68067	52
450694	IU Intl Corp.	0.95013	22
502210	LTV Corp.	1.24833	36

NOTE: Industry codes are COMPUSTAT industry classification numbers.

TABLE A-16. Calculated dividend payout ratios--Sub-sample 2A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Consolidated Foods Corp.	0.57522	47	0.57522	47.0	0.57522	47.0
Kane-Miller Corp.	0.04689	8	0.04838	8.0	0.04847	8.0
Borden, Inc.	0.42505	37	0.42505	35.0	0.42505	35.0
Green Giant Co.	0.44668	38	0.44668	38.0	0.44668	37.0
Archer-Daniels-Midland Co.	0.11730	9	0.11730	9.0	0.11730	9.0
Stevens (J.P.) & Co.	0.34780	26	0.34238	26.0	0.32512	25.0
Phillips Van Heusen	0.51952	43	0.51952	42.0	0.51952	42.0
Crown Zellerbach	0.40992	33	0.40992	32.0	0.40992	32.0
Fibreboard Corp.	0.46362	41	0.46362	40.0	0.46362	39.0
Pennwalt Corp.	0.37829	29	0.37829	28.0	0.37829	28.0
Squibb Corp.	0.39701	32	0.39701	30.0	0.39701	30.0
Insilco Corp.	0.37789	28	0.37789	27.0	0.37789	27.0
Williams Cos.	0.13154	11	0.13154	10.0	0.13154	10.0
Phillips Petroleum Co.	0.32785	25	0.32785	25.0	0.32785	26.0
Union Oil Co. of California	0.27327	20	0.27327	20.0	0.27327	20.0
Cooper Tire & Rubber	0.36883	27	0.43766	37.0	0.44466	36.0
Uniroyal, Inc.	0.56830	45	0.56830	45.0	0.56830	45.0
Puerto Rican Cement Co., Inc.	1.00000	50	1.00000	50.5	1.00000	50.5
Belden Corp.	0.46109	39	0.48066	41.0	0.48066	41.0
American Hoist & Derrick Co.	0.23038	16	0.23038	15.0	0.23038	15.0
Leesona Corp.	0.18190	13	0.18190	13.0	0.18190	13.0
Pitney-Bowes, Inc.	0.29909	22	0.29909	22.0	0.29909	22.0
Scott & Fetzer Co.	0.42404	36	0.42404	34.0	0.42404	34.0
Intl. Rectifier Corp.	1.60658	52	1.60658	53.0	1.60658	53.0
CCI Corp.	0.00000	4	0.00000	4.0	0.00000	4.0
Fisher Scientific Co.	0.14994	12	0.14994	12.0	0.14994	12.0
Milton Bradley Co.	0.31268	23	0.31268	23.0	0.31268	23.0
IC Inds.	0.39400	30	0.40122	31.0	0.40392	31.0

TABLE A-16. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
SOO Line Railroad	0.54193	44	0.54193	43.0	0.54193	43.0
Eastern Air Lines	0.00000	4	0.00000	4.0	0.00000	4.0
Tiger International	0.21174	14	0.23195	16.0	0.23334	16.0
World Airways, Inc.	0.00000	4	0.00000	4.0	0.00000	4.0
Di Giorgio Corp.	0.82473	48	0.82473	48.0	0.82473	48.0
Wickes Corp.	0.51893	42	0.54641	44.0	0.55097	44.0
Amfac, Inc.	0.25052	19	0.25954	18.0	0.26316	19.0
Cook United, Inc.	0.77523	53	1.00000	50.5	1.00000	50.5
Federated Dept. Stores, Inc.	0.39454	31	0.39454	29.0	0.39454	29.0
May Department Stores Co.	0.42112	35	0.42038	33.0	0.42038	33.0
Outlet Co.	0.25015	18	0.25976	19.0	0.26017	18.0
Sears, Roebuck & Co.	0.46200	40	0.46332	39.0	0.46400	40.0
Zayre Corp.	0.00000	4	0.00000	4.0	0.00000	4.0
Rapid-American Corp.	1.00000	50	1.00000	50.5	1.00000	50.5
Allied Supermarkets	0.00000	4	0.00000	4.0	0.00000	4.0
Colonial Stores, Inc.	0.41943	34	0.43361	36.0	0.44837	38.0
Great Atlantic & Pac. Tea Co.	1.00000	50	1.00000	50.5	1.00000	50.5
National Tea Co.	0.00000	4	0.00000	4.0	0.00000	4.0
Weis Markets, Inc.	0.24787	17	0.24787	17.0	0.24787	17.0
Denny's, Inc.	0.12342	10	0.13585	11.0	0.13703	11.0
Howard Johnson Co.	0.21238	15	0.20588	14.0	0.20586	14.0
Walgreen Co.	0.57377	46	0.57377	46.0	0.57377	46.0
Ramada Inns	0.27471	21	0.28299	21.0	0.28395	21.0
IU Intl. Corp.	0.31970	24	0.31970	24.0	0.31970	24.0
LTV Corp.	0.00000	4	0.00000	4.0	0.00000	4.0

TABLE A-17. Calculated asset growth variables--Sub-sample 2A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Consolidated Foods Corp.	0.06999	23	0.079092	17	0.091259	19
Kane-Miller Corp.	0.10023	36	0.126524	37	0.129756	33
Borden, Inc.	0.07618	25	0.085943	23	0.092992	20
Green Giant Co.	0.09499	32	0.113445	31	0.128841	31
Archer-Daniels-Midland Co.	0.24164	53	0.292779	53	0.306619	53
Stevens (J.P.) & Co.	0.06185	21	0.068030	15	0.081637	15
Phillips Van Heusen	0.00690	9	0.024631	6	0.064388	11
Crown Zellerbach	0.10056	37	0.111087	30	0.115501	25
Fibreboard Corp.	0.02171	12	0.034586	8	0.035881	6
pennwalt Corp.	0.09398	31	0.108045	28	0.116246	26
Squibb Corp.	0.09243	30	0.102155	26	0.108891	23
Insilco Corp.	-0.01726	5	-0.002632	2	0.004087	2
Williams Cos.	0.16983	52	0.177551	50	0.181987	50
Phillips Petroleum Co.	0.10959	40	0.125396	36	0.125396	30
Union Oil Co. of California	0.11240	41	0.131792	39	0.136550	36
Cooper Tire & Rubber	0.10008	35	0.160008	45	0.164477	42
Uniroyal, Inc.	0.02407	13	0.035119	9	0.035119	5
Puerto Rican Cement Co., Inc.	0.00020	6	0.000358	3	0.005380	3
Belden Corp.	0.09677	34	0.116655	32	0.116655	27
American Hoist & Derrick Co.	0.13565	49	0.147892	43	0.147892	38
Leesona Corp.	0.07178	24	0.082465	19	0.082734	16
Pitney-Bowes, Inc.	0.06790	22	0.079639	18	0.102255	21
Scott & Fetzer Co.	0.15711	51	0.169894	49	0.178721	48
Intl. Rectifier Corp.	0.15276	50	0.165095	46	0.172714	46
CCI Corp.	0.05441	19	0.061694	13	0.072191	13
Fisher Scientific Co.	0.05958	20	0.073769	16	0.075970	14
Milton Bradley Co.	0.12458	45	0.136255	40	0.141279	37
IC Inds.	0.09525	33	0.109818	29	0.113260	24

TABLE A-17. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
SOU Line Railroad	0.05332	18	0.066939	14	0.067736	12
Eastern Air Lines	0.00913	10	0.127784	38	0.170732	44
Tiger International	0.12478	46	0.169797	48	0.172118	45
World Airways, Inc.	-0.06569	2	0.022963	5	0.030948	4
Di Giorgio Corp.	0.02872	14	0.048093	10	0.059383	8
Wickes Corp.	0.08696	28	0.123830	35	0.129669	32
Amfac, Inc.	0.08927	29	0.156438	44	0.176778	47
Cook United, Inc.	-0.03600	3	0.058422	12	0.060977	9
Federated Dept. Stores, Inc.	0.12427	44	0.146739	42	0.153010	39
May Department Stores Co.	0.08680	27	0.103891	27	0.103891	22
Outlet Co.	0.11633	43	0.167837	47	0.169194	43
Sears, Roebuck & Co.	0.07742	26	0.084384	20	0.087810	17
Zayre Corp.	0.01576	11	0.096943	25	0.157103	40
Rapid-American Corp.	-0.03267	4	0.002491	4	0.047012	7
Allied Supermarkets	0.00650	8	0.084875	21	0.089777	18
Colonial Stores, Inc.	0.04190	15	0.095757	24	0.134965	35
Great Atlantic & Pac. Tea Co.	0.00583	7	0.032190	7	0.131474	34
National Tea Co.	-0.11690	1	-0.054292	1	-0.003375	1
Weis Markets, Inc.	0.13451	48	0.146299	41	0.160505	41
Denny's, Inc.	0.12825	47	0.264331	52	0.272154	52
Howard Johnson Co.	0.10697	39	0.235605	51	0.235824	51
Walgreen Co.	0.04818	17	0.085892	22	0.181911	49
Ramada Inns	0.10496	38	0.117846	33	0.120151	28
IU Intl. Corp.	0.11246	42	0.119192	34	0.124036	29
LTV Corp.	0.04476	16	0.057641	11	0.061252	10

TABLE A-18. Calculated leverage ratios---Sub-sample 2A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Consolidated Foods Corp.	0.470688	16	0.506961	13	0.530681	16
Kane-Miller Corp.	0.547970	26	0.607033	29	0.610091	26
Borden, Inc.	0.446118	11	0.466713	9	0.483387	9
Green Giant Co.	0.635048	40	0.668827	36	0.683229	35
Archer-Daniels-Midland Co.	0.505142	20	0.585824	24	0.605457	25
Stevens (J.) & Co.	0.450717	12	0.461228	6	0.492839	10
Phillips Van Heusen	0.480805	17	0.529488	19	0.591683	22
Crown Zellerbach	0.439766	10	0.464786	8	0.473791	7
Fibreboard Corp.	0.608067	36	0.626780	33	0.627838	29
Pennwalt Corp.	0.669081	46	0.689971	41	0.704048	42
Squibb Corp.	0.413032	7	0.444905	5	0.460690	5
Insilco Corp.	0.662162	44	0.680553	38	0.689321	37
Williams Cos.	0.548402	27	0.568594	23	0.579171	20
Phillips Petroleum Co.	0.386899	6	0.430704	4	0.431482	3
Union Oil Co. of California	0.521570	21	0.566889	22	0.577988	19
Cooper Tire & Rubber	0.630645	39	0.726134	45	0.731954	44
Uniroyal, Inc.	0.583878	32	0.603557	27	0.603557	24
Puerto Rican Cement Co., Inc.	0.609187	37	0.610671	30	0.616030	27
Belden Corp.	0.525283	23	0.566778	21	0.566778	18
American Hoist & Derrick Co.	0.690035	48	0.703369	44	0.703369	41
Leesona Corp.	0.483576	18	0.508583	14	0.510124	12
Pitney-Bowes, Inc.	0.599810	35	0.620627	31	0.655071	32
Scott & Fetzer Co.	0.358633	4	0.393059	2	0.411689	2
Intl. Rectifier Corp.	0.594348	34	0.622073	32	0.636470	30
CCI Corp.	0.693338	49	0.702939	43	0.715190	43
Fisher Scientific Co.	0.464899	15	0.491497	11	0.494870	11
Milton Bradley Co.	0.453400	13	0.474231	10	0.481810	8
IC Inds.	0.488248	19	0.513457	17	0.520023	14

TABLE A-18. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
SOU Line Railroad	0.427646	9	0.462952	7	0.465078	6
Eastern Air Lines	0.758005	50	0.843006	52	0.851477	52
Tiger International	0.684671	47	0.732932	46	0.735589	45
World Airways, Inc.	0.296916	3	0.513455	16	0.528404	15
Di Giorgio Corp.	0.659968	43	0.684641	40	0.696616	38
Wickes Corp.	0.581933	31	0.637232	34	0.643964	31
Amfac, Inc.	0.574566	29	0.670983	37	0.697262	39
Cook United, Inc.	0.618185	38	0.735138	47	0.738042	46
Federated Dept. Stores, Inc.	0.369188	5	0.427293	3	0.440121	4
May Department Stores Co.	0.554200	28	0.591573	25	0.591573	21
Outlet Co.	0.578416	30	0.652807	35	0.655322	33
Sears, Roebuck & Co.	0.523220	22	0.537532	20	0.544471	17
Zayre Corp.	0.655563	42	0.756072	49	0.809264	49
Rapid-American Corp.	0.837246	53	0.861614	53	0.882418	53
Allied Supermarkets	0.762945	51	0.832216	51	0.834339	51
Colonial Stores, Inc.	0.413541	8	0.524952	18	0.599281	23
Great Atlantic & Pac. Tea Co.	0.458570	14	0.497909	12	0.661076	34
National Tea Co.	0.638887	41	0.696587	42	0.758094	47
Weis Markets, Inc.	0.158100	2	0.206364	1	0.249013	1
Denny's, Inc.	0.541456	25	0.755564	48	0.764664	48
Howard Johnson Co.	0.121127	1	0.511601	15	0.512420	13
Walgreen Co.	0.535224	24	0.596302	26	0.702905	40
Ramada Inns	0.664515	45	0.681374	39	0.683752	36
IU Intl. Corp.	0.591619	33	0.604950	28	0.616415	28
LTV Corp.	0.808699	52	0.820281	50	0.822304	50

TABLE A-19. Calculated current ratios--Sub-sample 2A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Consolidated Foods Corp.	2.29929	38	2.20940	39	2.09489	35
Kane-Miller Corp.	2.23046	31	1.99902	27	1.97568	32
Borden, Inc.	2.09294	24	2.00865	32	1.95725	31
Green Giant Co.	2.87586	46	2.65186	46	2.50670	44
Archer-Daniels-Midland Co.	2.03018	22	1.92669	24	1.86541	27
Stevens (J.P.) & Co.	3.34212	48	3.20184	49	3.10548	49
Phillips Van Heusen	3.21504	47	3.00032	48	2.75297	48
Crown Zellerbach	2.27602	37	2.17342	36	2.12860	38
Fibreboard Corp.	1.84815	18	1.76271	20	1.75354	25
Pennwalt Corp.	2.74192	44	2.72699	47	2.62449	47
Squibb Corp.	2.71183	42	2.60464	44	2.52291	45
Insilco Corp.	2.22756	30	2.18052	37	2.11710	37
Williams Cos.	2.33899	41	2.23010	40	2.14405	39
Phillips Petroleum Co.	1.79683	17	1.70129	18	1.69730	20
Union Oil Co. of California	1.57794	10	1.47630	10	1.40157	11
Cooper Tire & Rubber	2.75397	45	2.43892	43	2.39199	43
Uniroyal, Inc.	2.31131	39	2.24602	41	2.24602	41
Puerto Rican Cement Co., Inc.	1.30757	4	1.29544	6	1.25847	6
Belden Corp.	4.06874	53	3.87742	53	3.87742	53
American Hoist & Derrick Co.	2.24266	32	2.20932	38	2.20932	40
Leesona Corp.	2.32859	40	2.26907	42	2.25748	42
Pitney-Bowes, Inc.	1.93575	20	1.89187	23	1.77714	26
Scott & Fetzer Co.	3.39849	50	3.26416	50	3.16874	50
Intl. Rectifier Corp.	2.13017	26	2.00351	30	1.93505	30
CCI Corp.	2.19057	28	2.12344	34	2.04994	34
Fisher Scientific Co.	3.338721	49	3.27315	51	3.24156	51
Milton Bradley Co.	2.72776	43	2.64887	45	2.60092	46
IC Inds.	1.48479	8	1.40253	9	1.37645	10

TABLE A-19. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
SOU Line Railroad	1.68142	15	1.54718	11	1.52811	13
Eastern Air Lines	0.98899	2	0.98899	3	0.76900	2
Tiger International	1.63149	12	1.24892	4	1.22822	5
World Airways, Inc.	2.25613	34	1.64974	17	1.62413	17
Di Giorgio Corp.	1.67892	14	1.62065	15	1.56970	14
Wickes Corp.	2.27382	36	2.13328	35	2.09767	36
Amfac, Inc.	1.97562	21	1.83099	22	1.74325	24
Cook United, Inc.	1.92842	19	1.64129	16	1.62179	16
Federated Dept. Stores, Inc.	1.79320	16	1.79320	21	1.71328	22
May Department Stores Co.	2.08158	23	2.00284	29	2.00284	33
Outlet Co.	2.25726	35	1.95159	26	1.93046	29
Sears, Roebuck & Co.	1.55001	9	1.55001	12	1.52679	12
Zayre Corp.	2.24446	33	1.93326	25	1.69712	19
Rapid-American Corp.	2.18984	27	2.01669	33	1.87040	28
Allied Supermarkets	1.47136	7	1.29413	5	1.27891	7
Colonial Stores, Inc.	2.22521	29	2.00089	28	1.72819	23
Great Atlantic & Pac. Tea Co.	1.61691	11	1.57751	13	1.29479	8
National Tea Co.	1.46252	6	1.34829	7	1.19348	4
Weis Markets, Inc.	3.84230	52	3.65857	52	3.43567	52
Denny's, Inc.	1.13899	3	0.76180	1	0.73143	1
Howard Johnson Co.	3.69600	51	1.72012	19	1.70537	21
Walgreen Co.	2.12667	25	2.00755	31	0.65634	18
Ramada Inns	0.92122	1	0.85523	2	0.84836	3
IU Intl. Corp.	1.38880	5	0.38411	8	1.34285	9
LTV Corp.	1.66581	13	1.61057	14	1.59387	15

TABLE A-20. Calculated asset size variables--Sub-sample 2A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Consolidated Foods Corp.	6.99008	38	7.06150	37	7.11075	37
Kane-Miller Corp.	5.14974	14	5.29050	13	5.29831	12
Borden, Inc.	7.40126	46	7.43914	44	7.47088	44
Green Giant Co.	5.51954	24	5.61587	22	5.66071	21
Archer-Daniels-Midland Co.	6.17297	31	6.34939	32	6.39662	32
Stevens (J.P.) & Co.	6.62877	35	6.64812	34	6.70860	34
Phillips Van Heusen	5.18142	16	5.28028	12	5.42191	13
Crown Zellerbach	7.29429	43	7.33987	42	7.35680	41
Fibreboard Corp.	5.40478	20	5.45360	15	5.45660	14
Pennwalt Corp.	6.24521	33	6.31103	31	6.35887	30
Squibb Corp.	7.01250	39	7.06859	38	7.09742	36
Incilco Corp.	5.83172	27	5.88733	26	5.91532	25
Williams Cos.	7.20167	41	7.24865	40	7.27419	40
Phillips Petroleum Co.	8.36105	52	8.43533	52	8.43674	52
Union Oil Co. of California	8.17744	51	8.27854	51	8.30477	51
Cooper Tire & Rubber	4.61575	8	4.91658	9	4.93810	9
Uniroyal, Inc.	7.38818	45	7.43672	43	7.43672	43
Puerto Rican Cement Co., Inc.	4.53643	6	4.53978	4	4.55439	4
Belden Corp.	4.52900	5	4.62035	5	4.62035	5
American Hoist & Derrick Co.	5.49753	23	5.54108	20	5.54108	17
Leesona Corp.	4.45206	3	4.50199	3	4.50522	3
Pitney-Bowes, Inc.	5.96745	29	6.02105	27	6.11654	28
Scott & Fetzer Co.	5.13875	12	5.19367	11	5.22492	11
Intl. Rectifier Corp.	3.93455	1	4.00648	1	4.04579	1
CCI Corp.	4.39793	2	4.42982	2	4.47183	2
Fisher Scientific Co.	4.63793	9	4.68873	8	4.69534	8
Milton Bradley Co.	4.97967	11	5.01850	10	5.03301	10
IC Inds.	7.65854	50	7.70884	50	7.72246	50

TABLE A-20. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
SOO Line Railroad	5.78446	26	5.84816	25	5.85212	24
Eastern Air Lines	7.21301	42	7.64505	47	7.70040	48
Tiger International	6.97783	37	7.14481	39	7.15471	38
World Airways, Inc.	5.19994	17	5.56923	21	5.60032	20
Di Giorgia Corp.	5.43115	21	5.50646	17	5.54504	18
Wickes Corp.	6.21909	32	6.36101	33	6.37995	31
Amfac, Inc.	6.60055	34	6.85713	35	6.94042	35
Cook United, Inc.	5.29746	18	5.66324	23	5.67422	22
Federated Dept. Stores, Inc.	7.48850	47	7.58509	46	7.60775	45
May Department Stores Co.	7.16165	40	7.24925	41	7.24925	39
Outlet Co.	4.45679	4	4.65249	7	4.65969	6
Sears, Roebuck & Co.	9.34881	53	9.37928	53	9.39440	53
Zayre Corp.	5.85074	28	6.19610	29	6.44213	33
Rapid-American Corp.	7.38816	44	7.55081	45	7.71321	49
Allied Supermarkets	5.16505	15	5.50827	18	5.52153	16
Colonial Stores, Inc.	5.14072	13	5.35107	14	5.52143	15
Great Atlantic & Pac. Tea Co.	6.92577	36	7.00430	36	7.39616	42
National Tea Co.	5.33011	19	5.50429	16	5.73066	23
Weis Markets, Inc.	4.56836	7	4.62742	6	4.68268	7
Denny's, Inc.	4.88560	10	5.52085	19	5.55947	19
Howard Johnson Co.	5.44712	22	6.03598	28	6.03769	26
Walgreen Co.	5.65817	25	5.79912	24	6.10685	27
Ramada Inns	6.15298	30	6.20514	30	6.21237	29
IU Intl. Corp.	7.61340	49	7.64664	48	7.67623	47
LTV Corp.	7.59401	48	7.65668	49	7.66792	46

TABLE A-21. Calculated measures of earnings variability--Sub-sample 2A.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Consolidated Foods Corp.	0.010463	16	0.010463	16	0.010463	16
Kane-Miller Corp.	0.015365	28	0.014731	26	0.014755	26
Borden, Inc.	0.005128	5	0.005128	5	0.005128	5
Green Giant Co.	0.011128	20	0.011128	19	0.011128	19
Archer-Daniels-Midland Co.	0.014564	26	0.014564	25	0.014564	25
Stevens (J.) & Co.	0.011168	21	0.011513	21	0.013100	23
Phillips Van Heusen	0.017545	32	0.017545	32	0.017545	32
Crown Zellerbach	0.017180	31	0.017180	31	0.017180	31
Fibreboard Corp.	0.049090	42	0.049090	42	0.049090	42
Pennwalt Corp.	0.010702	17	0.010702	17	0.010702	17
Squibb Corp.	0.000413	1	0.000413	1	0.000413	1
Insilco Corp.	0.011697	22	0.011697	22	0.011697	21
Williams Cos.	0.026283	39	0.026283	39	0.026283	39
Phillips Petroleum Co.	0.014906	27	0.014906	27	0.014906	27
Union Oil Co. of California	0.010118	14	0.010118	14	0.010118	14
Cooper Tire & Rubber	0.059276	46	0.060810	46	0.060888	46
Uniroyal, Inc.	0.013924	25	0.013924	24	0.013924	24
Puerto Rican Cement Co., Inc.	0.106032	51	0.105906	51	0.105696	51
Belden Corp.	0.010974	19	0.011308	20	0.011308	20
American Hoist & Derrick Co.	0.010968	18	0.010968	18	0.010968	18
Leesona Corp.	0.009480	13	0.009480	13	0.009480	13
Pitney-Bowes, Inc.	0.004633	3	0.004633	3	0.004633	3
Scott & Fetzer Co.	0.018649	34	0.018649	33	0.018649	33
Intl. Rectifier Corp.	0.072534	48	0.072534	47	0.072534	48
CCI Corp.	0.049109	43	0.049444	43	0.049832	43
Fisher Scientific Co.	0.018769	35	0.018769	34	0.018769	34
Milton Bradley Co.	0.010456	15	0.010456	15	0.010456	15
IC Inds.	0.003647	2	0.003279	2	0.003159	2

TABLE A-21. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
SOO Line Railroad	0.007387	10	0.007387	9	0.007387	9
Eastern Air Lines	0.071183	47	0.074209	48	0.072228	47
Tiger International	0.023310	37	0.023878	38	0.023840	38
World Airways, Inc.	0.016490	30	0.016402	29	0.016431	29
Di Giorgio Corp.	0.032018	40	0.032018	40	0.032018	40
Wickes Corp.	0.016039	29	0.016861	30	0.017021	30
Amfac, Inc.	0.033131	41	0.033819	41	0.034099	41
Cook United, Inc.	0.051363	44	0.052273	44	0.052316	44
Federated Dept. Stores, Inc.	0.005179	6	0.005179	7	0.005179	7
May Department Stores Co.	0.007197	8	0.007114	8	0.007114	8
Outlet Co.	0.005313	7	0.005153	6	0.005172	6
Sears, Roebuck & Co.	0.009115	12	0.009129	12	0.009138	12
Zayre Corp.	0.018555	33	0.019388	35	0.020172	35
Rapid-American Corp.	0.078082	49	0.078082	49	0.078082	49
Allied Supermarkets	0.160636	52	0.165886	52	0.166035	52
Colonial Stores, Inc.	0.007567	11	0.007712	11	0.007770	11
Great Atlantic & Pac. Tea Co.	0.093282	50	0.092877	50	0.090998	50
National Tea Co.	0.208014	53	0.211633	53	0.215084	53
Weis Markets, Inc.	0.004643	4	0.004643	4	0.004643	4
Denny's, Inc.	0.012084	23	0.015917	28	0.016365	28
Howard Johnson Co.	0.007383	9	0.007684	10	0.007683	10
Walgreen Co.	0.012967	24	0.012967	23	0.012967	22
Ramada Inns	0.023118	36	0.023813	37	0.023819	37
IU Intl. Corp.	0.023784	38	0.023784	36	0.023784	36
LTV Corp.	0.054115	45	0.054115	45	0.054115	45

TABLE A-22. Calculated post-disclosure market risk measures (b_2)--
Sub-sample 2B.

Industry code	Company's name	b_2	Rank
2010	Greyhound Corp.	0.52772	3
2020	Beatrice Foods Co.	0.73836	9
2030	Del Monte Corp.	0.67836	6
2046	CPC Intl, Inc.	0.63309	5
2200	Fieldcrest Mills	0.90703	20
2300	Bobbie Brooks, Inc.	1.54114	46
2450	Redman Inds., Inc.	2.10965	53
2650	Federal Paper Board Co.	0.86431	16
2800	Allied Chemical Corp.	0.71747	7
2810	Airco, Inc.	0.86777	17
2844	Helene Curtis Inds.	1.72113	51
2860	Crompton & Knowles Corp.	1.10259	36
2911	Clark Oil & Refining Corp.	1.18308	39
2911	Standard Oil Co. (Indiana)	0.19755	1
2950	National Gypsum Co.	0.85744	15
3000	Goodrich (B.F.) Co.	0.92092	22
3140	Melville Corp.	1.38435	43
3270	Texas Inds., Inc.	0.92390	23
3494	Crane Co.	0.73173	8
3531	Unarco Inds., Inc.	0.76494	10
3570	NCR Corp.	1.01471	28
3580	GCA Corp.	1.80335	52
3630	Scoville Mfg. Co.	1.09162	34
3699	Globe-Union, Inc.	1.12874	38
3714	TRW, Inc.	1.02521	29
3940	Fuqua Inds., Inc.	1.55356	47
4011	Chessie System, Inc.	0.45625	2
4011	Kansas City Southern Inds.	0.85533	14
4511	Braniff Intl. Corp.	1.50743	45
4511	Pan American World Airways	1.62748	49
4511	UAL, Inc.	1.03864	30
5120	Foremost-McKesson, Inc.	0.80461	11
5140	Scot Lad Foods	1.25457	42
5311	Allied Stores	0.99606	27
5311	Assd. Dry Goods Corp.	0.90711	21
5311	Dayton-Hudson Corp.	0.98662	26
5311	Macy (R.H.) & Co.	1.09411	35
5311	Mercantile Stores Co., Inc.	1.06893	32
5311	Penney (J.C.) Co.	0.88212	18

TABLE A-22. (continued)

Industry code	Company's name	b_2	Rank
5311	Wal-Mart Stores	1.45495	44
5331	Murphy (G.C.) Co.	0.89885	19
5411	Albertson's, Inc.	0.53046	4
5411	American Stores Co.	0.93630	25
5411	Fisher Foods, Inc.	1.07470	33
5411	Lucky Stores, Inc.	0.84008	13
5411	Pueblo Intl., Inc.	1.11176	37
5661	Edison Brothers Stores	0.81758	12
5812	Host Intl., Inc.	1.23683	41
5912	Thrifty Corporation	1.04087	31
7011	Holiday Inns, Inc.	1.56758	48
7011	Webb (Del E.) Corp.	1.69326	50
9997	Katy Inds.	1.23287	40
9997	National Inds.	0.93094	24

NOTE: Industry codes are COMPUSTAT industry classification numbers.

TABLE A-23. Calculated dividend payout ratios--Sub-sample 2B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Greyhound Corp.	0.60044	51.0	0.60044	51.0	0.60044	51.0
Beatrice Foods Co.	0.38367	36.0	0.38367	36.0	0.38367	35.0
Del Monte Corp.	0.33414	30.0	0.33414	30.0	0.33414	30.0
CPC Intl., Inc.	0.48488	44.0	0.48488	43.0	0.48488	43.0
Fieldcrest Mills	0.55212	49.0	0.55536	49.0	0.55651	49.0
Bobbie Brooks, Inc.	0.00000	3.5	0.00000	3.5	0.00000	3.5
Redman Inds., Inc.	0.55072	48.0	0.55072	48.0	0.55072	48.0
Federal Paper Board Co.	0.24975	16.0	0.24975	16.0	0.24975	16.0
Allied Chemical Corp.	0.36587	34.0	0.36587	34.0	0.36587	33.0
Airco, Inc.	0.28296	24.0	0.28296	20.0	0.28296	20.0
Helene Curtis Inds.	0.00000	3.5	0.00000	3.5	0.00000	3.5
Crompton & Knowles Corp.	0.41812	38.0	0.41812	38.0	0.41812	37.0
Clark Oil & Refining Corp.	0.37359	35.0	0.37359	35.0	0.37359	34.0
Standard Oil Co. (Indiana)	0.33070	29.0	0.33070	29.0	0.33070	28.0
National Gypsum Co.	0.62973	52.0	0.62973	52.0	0.62973	52.0
Goodrich (B.F.) Co.	0.42521	39.0	0.42521	39.0	0.42521	39.0
Melville Corp.	0.31467	28.0	0.31467	26.0	0.31467	26.0
Texas Inds., Inc.	0.52120	47.0	0.52120	46.0	0.52120	44.0
Crane Co.	0.18241	14.0	0.18241	13.0	0.18241	13.0
Unarco Inds., Inc.	0.14149	11.0	0.14149	11.0	0.14149	11.0
NCR Corp.	0.19907	15.0	0.19907	15.0	0.19907	15.0
GCA Corp.	0.00000	3.5	0.00000	3.5	0.00000	3.5
Scovill Mfg. Co.	0.44658	41.0	0.44658	41.0	0.44658	41.0
Globe-Union, Inc.	0.26085	19.0	0.26085	19.0	0.26085	19.0
TRW, Inc.	0.35629	33.0	0.35629	32.0	0.35629	32.0
Fuqua Inds., Inc.	0.05890	7.0	0.05890	7.0	0.05890	7.0
Chessie System, Inc.	0.42595	40.0	0.43448	40.0	0.43459	40.0
Kansas City Southern Inds.	0.49035	45.0	0.51953	45.0	0.52667	45.0

TABLE A-23. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	0.12055	10.0	0.13258	10.0	0.13347	10.0
Pan American World Airways	0.00000	3.5	0.00000	3.5	0.00000	3.5
UAL, Inc.	0.27177	20.0	0.32899	28.0	0.33132	29.0
Foremost-McKesson, Inc.	0.35143	31.0	0.35143	31.0	0.35143	31.0
Scot Lad Foods	0.28188	22.0	0.30103	23.0	0.30170	23.0
Allied Stores	0.28268	23.0	0.29231	21.0	0.29400	21.0
Assd. Dry Goods Corp.	0.45709	42.0	0.45702	42.0	0.45702	42.0
Dayton-Hudson Corp.	0.25908	18.0	0.25908	18.0	0.25908	18.0
Macy (R.H.) & Co.	0.30774	27.0	0.30774	25.0	0.30774	25.0
Mercantile Stores Co., Inc.	0.18102	12.0	0.18102	12.0	0.18102	12.0
Penney (J.C.) Co.	0.39003	37.0	0.41578	37.0	0.42083	38.0
Wal-Mart Stores	0.07403	8.0	0.07717	8.0	0.07821	8.0
Murphy (G.C.) Co.	0.48329	43.0	0.50116	44.0	0.54632	47.0
Albertson's, Inc.	0.28169	21.0	0.30489	24.0	0.30528	24.0
American Stores Co.	0.29899	25.0	0.31809	27.0	0.32480	27.0
Fisher Foods, Inc.	0.18184	13.0	0.19089	14.0	0.19175	14.0
Lucky Stores, Inc.	0.50857	46.0	0.53520	47.0	0.53871	46.0
Pueblo Intl., Inc.	1.00000	53.0	1.00000	53.0	1.00000	53.0
Edison Brothers Stores	0.29990	26.0	0.29990	22.0	0.29990	22.0
Host Intl., Inc.	0.35548	32.0	0.36490	33.0	0.39276	36.0
Thrifty Corporation	0.56335	50.0	0.59640	50.0	0.59640	50.0
Holiday Inns, Inc.	0.25330	17.0	0.25330	17.0	0.25330	17.0
Webb (Del E.) Corp	0.00000	3.5	0.00000	3.5	0.00000	3.5
Katy Inds.	0.00000	3.5	0.00000	3.5	0.00000	3.5
National Inds.	0.10226	9.0	0.10226	9.0	0.10226	9.0

TABLE A-24. Calculated asset growth variables--Sub-sample 2B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Greyhound Corp.	0.04499	16	0.05246	12	0.06375	14
Beatrice Foods Co.	0.16792	51	0.18577	47	0.19295	41
Del Monte Corp.	0.07458	29	0.09027	27	0.10125	27
CPC Intl., Inc.	0.07443	28	0.08105	20	0.08540	21
Fieldcrest Mills	0.05500	19	0.06800	15	0.07236	15
Bobbie Brooks, Inc.	-0.14725	2	-0.13364	2	-0.10623	2
Redman Inds., Inc.	-0.22752	1	-0.19166	1	-0.16746	1
Federal Paper Board Co.	0.09720	36	0.10946	30	0.11250	31
Allied Chemical Corp.	0.09603	35	0.10616	29	0.10837	29
Airco, Inc.	0.05823	20	0.07558	19	0.07802	18
Helene Curtis Inds.	0.16555	50	0.19257	49	0.19360	42
Crompton & Knowles Corp.	0.05179	18	0.06926	17	0.07386	16
Clark Oil & Refining Corp.	0.11349	42	0.18829	48	0.23580	49
Standard Oil Co. (Indiana)	0.14869	46	0.16004	39	0.16711	37
National Gypsum Co.	0.04283	15	0.05232	11	0.05678	11
Goodrich (B.F.) Co.	0.02816	10	0.03878	10	0.04668	10
Melville Corp.	0.15569	48	0.16294	40	0.28846	51
Texas Inds., Inc.	0.02819	11	0.05698	14	0.06040	13
Crane Co.	0.06861	25	0.08240	23	0.08516	20
Unarco Inds., Inc.	0.16362	49	0.17684	44	0.18680	40
NCR Corp.	0.07843	30	0.08889	25	0.09441	25
GCA Corp.	0.10290	39	0.13230	35	0.13398	34
Scovill Mfg. Co.	0.02167	9	0.03427	8	0.04213	6
Globe-Union, Inc.	0.07358	26	0.08708	24	0.09185	24
TRW, Inc.	0.10354	38	0.11399	33	0.11986	33
Fuqua Inds., Inc.	0.01410	7	0.03285	6	0.04261	7
Chessie System, Inc.	0.03528	13	0.05552	13	0.05723	12
Kansas City Southern Inds.	-0.01458	5	0.02119	4	0.02647	4

TABLE A-24. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl., Corp.	0.09733	37	0.16522	42	0.16826	38
Pan American World Airways	-0.05037	4	0.03521	9	0.04161	5
UAL, Inc.	0.05066	17	0.11357	32	0.11588	32
Foremost-McKesson, Inc.	0.06615	22	0.08231	22	0.09122	23
Scot Lad Foods	0.08133	32	0.15376	38	0.15585	35
Allied Stores	0.03959	14	0.07419	18	0.08097	19
Assd. Dry Goods Corp.	0.02863	12	0.08960	26	0.08960	22
Dayton-Hudson Corp.	0.07385	27	0.08221	21	0.10530	28
Macy (R.H.) & Co.	0.08225	33	0.11237	31	0.11237	30
Mercantile Stores Co., Inc.	0.12876	45	0.16307	41	0.16663	36
Penney (J.C.) Co.	0.12024	43	0.18332	46	0.20902	45
Wal-Mart Stores	0.26442	53	0.34987	53	0.36520	53
Murphy (G.C.) Co.	0.07908	31	0.12646	34	0.21815	46
Albertson's, Inc.	0.21142	52	0.34591	52	0.34646	52
American Stores Co.	0.10589	40	0.17649	43	0.19614	43
Fisher Foods, Inc.	0.15554	47	0.22570	51	0.23066	47
Lucky Stores, Inc.	0.12800	44	0.22232	50	0.23124	48
Pueblo Intl., Inc.	-0.10810	3	0.02943	5	0.04367	9
Edison Brothers Stores	0.09198	34	0.13420	36	0.25992	50
Host Intl., Inc.	0.11234	41	0.13872	37	0.20572	44
Thrifty Corporation	0.06425	21	0.17839	45	0.17839	39
Holiday Inns, Inc.	0.01983	8	0.03425	7	0.04307	8
Webb (Del E.) Corp.	-0.00046	6	0.01035	3	0.01368	3
Katy Inds.	0.06727	23	0.06832	16	0.07407	17
National Inds.	0.06770	24	0.09197	28	0.09699	26

TABLE A-25. Calculated leverage ratios--Sub-sample 2B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Greyhound Corp.	0.461033	17	0.477928	10	0.502516	10
Beatrice Foods Co.	0.411963	10	0.459549	7	0.475085	7
Del Monte Corp.	0.532872	27	0.562493	23	0.581822	22
CPC Intl., Inc.	0.444928	14	0.460852	8	0.472460	6
Fieldcrest Mills	0.495160	22	0.523979	18	0.533221	16
Bobbie Brooks, Inc.	0.637691	46	0.654481	37	0.686284	38
Redman Inds., Inc.	0.555368	30	0.601617	28	0.629000	30
Federal Paper Board Co.	0.550475	29	0.570169	24	0.576016	21
Allied Chemical Corp.	0.403429	9	0.433361	5	0.439972	4
Airco, Inc.	0.426191	12	0.476806	9	0.480569	8
Helene Curtis Inds.	0.419677	11	0.487039	12	0.488919	9
Crompton & Knowles Corp.	0.489950	20	0.535236	21	0.540379	17
Clark Oil & Refining Corp.	0.589375	37	0.699625	41	0.761838	49
Standard Oi. Co. (Indiana)	0.389434	6	0.418390	4	0.438833	3
National Gypsum Co.	0.281632	1	0.311091	1	0.322214	1
Goodrich (B.F.) Co.	0.488019	19	0.508101	16	0.523948	13
Melville Corp.	0.385315	5	0.408127	2	0.648316	31
Texas Inds., Inc.	0.569778	33	0.614113	32	0.618840	26
Crane Co.	0.579865	35	0.606116	30	0.612392	24
Unarco Inds., Inc.	0.653740	47	0.677700	39	0.690361	39
NCR Corp.	0.600356	41	0.617449	33	0.627074	29
GCA Corp.	0.336655	2	0.408508	3	0.412082	2
Scovill Mfg. Co.	0.506220	23	0.533108	20	0.544516	18
Globe-Union, Inc.	0.575043	34	0.602408	29	0.610784	23
TRW, Inc.	0.702493	49	0.715098	43	0.720351	42
Fuqua Inds., Inc.	0.619323	44	0.649767	36	0.658963	32
Chessie System, Inc.	0.452114	15	0.501357	13	0.502642	11
Kansas City Southern Inds.	0.454455	16	0.514934	17	0.526130	15

TABLE A-25. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	0.634582	45	0.725074	44	0.729418	43
Pan American World Airways	0.758193	53	0.817900	53	0.822627	53
UAL, Inc.	0.581417	36	0.682113	40	0.684646	37
Foremost-McKesson, Inc.	0.749925	52	0.765924	51	0.773777	51
Scot Lad Foods	0.609575	43	0.729516	46	0.732253	44
Allied Stores	0.607579	42	0.670017	38	0.678730	35
Assd. Dry Goods Corp.	0.397449	7	0.524242	19	0.524242	14
Dayton-Hudson Corp.	0.566651	32	0.582730	26	0.620834	27
Macy (R.H.) & Co.	0.513969	25	0.574798	25	0.574798	20
Mercantile Stores Co., Inc.	0.367874	3	0.445882	6	0.454657	5
Penney (J.C.) Co.	0.442663	13	0.561153	22	0.572099	19
Wal-Mart Stores	0.491652	21	0.637081	34	0.672089	33
Murphy (G.C.) Co.	0.401435	8	0.502921	15	0.623625	28
Albertson's, Inc.	0.562866	31	0.731653	47	0.733677	45
American Stores Co.	0.513341	24	0.644354	35	0.672358	34
Fisher Foods, Inc.	0.691680	48	0.765403	50	0.770962	50
Lucky Stores, Inc.	0.598998	40	0.727927	45	0.738473	46
Pueblo Intl., Inc.	0.595435	38	0.735120	49	0.747900	48
Edison Brothers Stores	0.378110	4	0.482596	11	0.684461	36
Host Intl., Inc.	0.550162	28	0.597052	27	0.691400	40
Thrifty Corporation	0.527023	26	0.700339	42	0.700339	41
Holiday Inns, Inc.	0.469301	18	0.502522	14	0.516013	12
Webb (Del E.) Corp.	0.596176	39	0.613932	31	0.618521	25
Katy Inds.	0.727512	50	0.732589	48	0.741454	47
National Inds.	0.747832	51	0.773130	52	0.779223	52

TABLE A-26. Calculated current ratios--Sub-sample 2B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Greyhound Corp.	1.66224	18	1.64030	23	1.58251	20
Beatrice Foods Co.	2.38953	43	2.26206	42	2.20009	45
DeI Monte Corp.	2.30930	40	2.16895	39	2.10664	43
CPC Intl., Inc.	1.67905	19	1.64851	24	1.62197	24
Fieldcrest Mills	3.38484	51	3.24428	51	3.16771	51
Bobbie Brooks, Inc.	1.97125	29	1.91500	30	1.80965	31
Redman Inds., Inc.	1.39964	8	1.23170	8	1.16793	8
Federal Paper Board Co.	2.48274	45	2.31332	45	2.24527	47
Allied Chemical Corp.	2.14979	33	2.05530	36	2.01012	38
Airco, Inc.	2.66984	48	2.35733	46	2.33240	48
Helene Curtis Inds.	2.07107	32	1.96619	33	1.95686	35
Crompton & Knowles Corp.	2.99035	50	2.78726	49	2.74381	50
Clark Oil & Refining Corp.	1.29452	5	1.15453	6	1.00712	4
Standard Oil Co. (Indiana)	1.48708	12	1.45954	15	1.39980	16
National Gypsum Co.	4.02696	52	3.42876	52	3.29617	52
Goodrich (B.F.) Co.	2.36004	42	2.28283	43	2.20195	46
Melville Corp.	2.92025	49	2.87710	50	2.05567	39
Texas Inds., Inc.	2.29818	39	1.78441	26	1.73627	27
Crane Co.	2.17545	34	2.11499	38	2.07144	41
Unarco Inds., Inc.	2.25627	37	2.18205	41	2.12453	44
NCR Corp.	1.98654	30	1.95812	32	1.92085	33
GCA Corp.	4.34817	53	3.93849	53	3.87963	53
Scovill Mfg. Co.	2.03018	31	1.93616	31	1.90507	32
Globe-Union, Inc.	1.86752	26	1.81350	28	1.78725	29
TRW, Inc.	1.85112	25	1.81343	27	1.77926	28
Fuqua Inds., Inc.	1.68036	20	1.60147	19	1.56234	19
Chessie System, Inc.	1.12725	2	1.04043	4	1.03547	5
Kansas City Southern Inds.	1.11971	1	0.96091	2	0.93168	2

TABLE A-26. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	1.17111	4	0.91650	1	0.88774	1
Pan American World Airways	1.14487	3	0.96375	3	0.94486	3
UAL, Inc.	1.57938	16	1.30193	11	1.28971	13
Foremost-McKesson, Inc.	1.82632	24	1.75091	25	1.71867	26
Scot Lad Foods	1.76532	22	1.55723	18	1.53761	18
Allied Stores	2.25634	38	2.09282	37	2.06534	40
Assd. Dry Goods Corp.	2.21147	36	1.98010	34	1.98010	36
Dayton-Hudson Corp.	1.90377	27	1.87703	29	1.79210	30
Macy (R.H.) & Co.	1.45684	10	1.37670	14	1.37670	15
Mercantile Stores Co., Inc.	2.63648	47	2.44957	48	2.41219	49
Penney (J.C.) Co.	1.77624	23	1.63413	22	1.60718	23
Wal-Mart Stores	2.32790	41	2.04391	35	1.92159	34
Murphy (G.C.) Co.	2.63394	46	2.43145	47	1.99471	37
Albertson's, Inc.	1.45923	11	1.23125	7	1.22313	9
American Stores Co.	1.62855	17	1.46541	16	1.37547	14
Fisher Foods, Inc.	1.42491	9	1.26228	9	1.24305	11
Lucky Stores, Inc.	1.49712	14	1.31740	12	1.28591	12
Pueblo Intl., Inc.	1.31683	6	1.09668	5	1.05536	6
Edison Brothers Stores	2.47093	44	2.28915	44	1.62949	25
Host Intl., Inc.	1.49672	13	1.37613	13	1.09134	7
Thrifty Corporation	1.91856	28	1.60203	20	1.60202	22
Holiday Inns, Inc.	1.35224	7	1.27591	10	1.23502	10
Webb (Del E.) Corp.	1.68302	21	1.62557	21	1.60059	21
Katy Inds.	2.20321	35	2.17106	40	2.10552	42
National Inds.	1.52667	15	1.46685	17	1.43851	17

TABLE A-27. Calculated asset size variables--Sub-sample 2B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Greyhound Corp.	7.23729	43	7.26916	43	7.31745	43
Beatrice Foods Co.	7.46369	47	7.54822	46	7.57742	46
Del Monte Corp.	6.61986	35	6.68521	34	6.73040	34
CPC Intl., Inc.	7.20859	42	7.23775	42	7.25959	42
Fieldcrest Mills	5.29383	17	5.35272	14	5.37238	14
Bobbie Brooks, Inc.	4.50575	6	4.55357	4	4.65097	6
Redman Inds., Inc.	4.40583	3	4.52360	3	4.59558	3
Federal Paper Board Co.	5.62376	21	5.66850	19	5.68218	17
Allied Chemical Corp.	7.64285	48	7.69420	48	7.70591	48
Airco, Inc.	6.52212	34	6.61467	33	6.62184	33
Helene Curtis Inds.	3.63333	2	3.75644	2	3.76006	2
Crompton & Knowles Corp.	4.49902	5	3.59152	6	4.60270	4
Clark Oil & Refining Corp.	5.69873	24	6.01037	27	6.24238	27
Standard Oil Co. (Indiana)	9.11806	53	9.16655	53	9.20223	53
National Gypsum Co.	6.19126	29	6.23301	29	6.24932	28
Goodrich (B.F.) Co.	7.35909	45	7.39910	44	7.43179	44
Melville Corp.	5.84376	26	5.88144	25	6.40164	29
Texas Inds., Inc.	4.81522	11	4.92405	9	4.93632	8
Crane Co.	6.50048	33	6.56535	32	6.58172	31
Unarco Inds., Inc.	4.51701	7	4.59073	5	4.63004	5
NCR Corp.	7.65211	49	7.69591	49	7.72142	49
GCA Corp.	3.55302	1	3.66746	1	3.67352	1
Scovill Mfg. Co.	5.90105	27	5.95743	26	5.98203	25
Globe-Union, Inc.	5.16346	13	5.23073	13	5.25192	13
TRW, Inc.	7.41949	46	7.46293	45	7.48121	45
Fuqua Inds., Inc.	6.01132	28	6.09483	28	6.12118	26
Chessie System, Inc.	7.92525	51	8.01946	50	8.02204	50
Kansas City Southern Inds.	5.67146	22	5.78842	21	5.81174	19

TABLE A-27. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl. Corp.	6.24949	31	6.53341	31	6.54957	30
Pan American World Airways	7.34906	44	7.63157	47	7.65818	47
UAL, Inc.	7.88020	50	8.15572	51	8.16371	51
Foremost-McKesson, Inc.	6.74891	38	6.81498	36	6.84899	37
Scot Lad Foods	4.71851	10	5.08654	10	5.09679	10
Allied Stores	6.98833	41	7.16431	41	7.19103	41
Assd. Dry Goods Corp.	6.62630	36	6.86168	39	6.86168	38
Dayton-Hudson Corp.	6.82368	39	6.86150	38	6.95727	40
Macy (R.H.) & Co.	6.70353	37	6.83734	37	6.83734	36
Mercantile Stores Co., Inc.	5.73154	25	5.86350	24	5.87949	22
Penney (J.C.) Co.	7.98801	52	8.22697	52	8.25267	52
Wal-Mart Stores	4.47893	4	4.81595	8	4.91760	7
Murphy (G.C.) Co.	5.42584	18	5.61179	17	5.89458	24
Albertson's, Inc.	5.23917	16	5.72521	20	5.73294	18
American Stores Co.	6.21671	30	6.53162	30	6.61372	32
Fisher Foods, Inc.	5.53222	20	5.80458	23	5.82843	21
Lucky Stores, Inc.	6.30460	32	6.69266	35	6.73220	35
Pueblo Intl., Inc.	4.67474	8	5.10002	11	5.14974	12
Edison Brothers Stores	5.21700	15	5.40016	15	5.89439	23
Host Intl., Inc.	4.70383	9	4.81418	7	5.08059	9
Thrifty Corporation	5.16582	14	5.62176	18	5.62176	16
Holiday Inns, Inc.	6.83936	40	6.90430	40	6.93162	39
Webb (Del E.) Corp.	5.49535	19	5.54042	16	5.55236	15
Katy Inds.	5.08468	12	5.10237	12	5.13568	11
National Inds.	5.68825	23	5.79327	22	5.82111	20

TABLE A-28. Calculated measures of earnings variability--Sub-sample 2B.

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Greyhound Corp.	0.004602	4	0.004602	3	0.004602	3
Beatrice Foods Co.	0.001147	1	0.001147	1	0.001147	1
Del Monte Corp.	0.004858	5	0.004858	4	0.004858	4
CPC Intl., Inc.	0.006954	13	0.006954	13	0.006954	13
Fieldcrest Mills	0.023731	40	0.023929	40	0.023993	40
Bobbie Brooks, Inc.	0.050794	47	0.051085	47	0.051649	47
Redman Inds., Inc.	0.118008	51	0.118008	51	0.118008	51
Federal Paper Board Co.	0.011390	25	0.011390	25	0.011390	25
Allied Chemical Corp.	0.009894	21	0.009894	21	0.009894	21
Airco, Inc.	0.015991	33	0.015991	32	0.015991	32
Helene Curtis Inds.	0.009177	20	0.009468	19	0.009416	19
Crompton & Knowles Corp.	0.006834	12	0.006834	12	0.006834	12
Clark Oil & Refining Corp.	0.072576	50	0.072576	50	0.072576	50
Standard Oil Co. (Indiana)	0.013935	29	0.013935	29	0.013935	29
National Gypsum Co.	0.006214	9	0.006214	8	0.006214	8
Goodrich (B.F.) Co.	0.016008	34	0.016008	33	0.016008	33
Melville Corp.	0.018777	38	0.018777	38	0.018777	38
Texas Inds., Inc.	0.020030	39	0.020030	39	0.020030	39
Crane Co.	0.032199	45	0.032199	45	0.032199	45
Unarco Inds., Inc.	0.028488	42	0.028488	43	0.028488	43
NCR Corp.	0.007962	15	0.007962	15	0.007962	15
GCA Corp.	0.017341	35	0.017341	36	0.017341	36
Scovill Mfg. Co.	0.014434	30	0.014434	30	0.014434	30
Globe-Union, Inc.	0.011546	26	0.011546	26	0.011546	26
TRW, Inc.	0.005350	6	0.005350	6	0.005350	6
Fuqua Inds., Inc.	0.061492	49	0.061492	49	0.061492	49
Chessie System, Inc.	0.006077	7	0.006469	9	0.006474	9
Kansas City Southern Inds.	0.006362	10	0.006589	10	0.006624	10

TABLE A-28. (continued)

Company's name	Set 1	Rank	Set 2	Rank	Set 3	Rank
Braniff Intl., Corp.	0.012531	28	0.012129	28	0.011954	27
Pan American World Airways	0.057263	48	0.059397	48	0.059805	48
UAL, Inc.	0.029668	44	0.029466	44	0.029502	44
Foremost-Mckesson, Inc.	0.008447	17	0.008447	17	0.008447	17
Scot Lad Foods	0.029373	43	0.028124	42	0.028083	42
Allied Stores	0.008959	18	0.009281	18	0.009315	18
Assd. Dry Goods Corp.	0.006671	11	0.006686	11	0.006686	11
Dayton-Hudson Corp.	0.018592	37	0.018592	37	0.018592	37
Macy (R.H.) & Co.	0.012029	27	0.012029	27	0.012029	28
Mercantile Stores Co., Inc.	0.007747	14	0.007747	14	0.007747	14
Penney (J.C.) Co.	0.010937	24	0.010889	24	0.010872	24
Wal-Mart Stores	0.017776	36	0.016916	35	0.017171	35
Murphy (G.C.) Co.	0.001648	2	0.001239	2	0.002846	2
Albertson's, Inc.	0.004548	3	0.005160	5	0.005094	5
American Stores Co.	0.010453	22	0.010309	22	0.010238	22
Fisher Foods, Inc.	0.009060	19	0.009652	20	0.009678	20
Lucky Stores, Inc.	0.006097	8	0.006203	7	0.006190	7
Pueblo Intl., Inc.	0.169322	53	0.166612	53	0.166195	53
Edison Brothers Stores	0.014697	31	0.014697	31	0.014697	31
Host Intl., Inc.	0.042626	46	0.042567	46	0.042839	46
Thrifty Corporation	0.015630	32	0.016041	34	0.016041	34
Holiday Inns, Inc.	0.008111	16	0.008111	16	0.008111	16
Webb (Del E.) Corp.	0.010839	23	0.010839	23	0.010839	23
Katy Inds.	0.133430	52	0.133430	52	0.133430	52
National Inds.	0.026642	41	0.026642	41	0.026642	41

TABLE A-29. Pre- and post-disclosure market risk measures (b_1 and b_2)--
Sample 3.

Company's name	b_1	b_2
American Airlines, Inc.	1.43721	1.28399
Braniff Intl., Corp.	1.24583	1.50743
Continental Air Lines, Inc.	1.46453	1.52693
Delton Air Lines, Inc.	1.17177	.85946
Eastern Air Lines	1.63449	1.46501
National Airlines, Inc.	1.69998	1.58049
Northwest Airlines, Inc.	1.45270	1.20020
PSA, Inc.	1.75878	1.34116
Pan American World Airways	1.32980	1.62748
Seaboard World Airlines	1.95282	1.67027
Tiger International	1.93272	1.37095
Trans World Airlines	1.69460	1.71735
UAL, Inc.	1.56737	1.03864
Western Air Lines, Inc.	2.12785	1.26875
World Airways, Inc.	1.79861	1.50840
Allied Stores	1.26972	.99606
Amfac, Inc.	1.17815	.83670
Assd. Dry Goods Corp.	.94660	.90711
Carter Hawley Hale Stores	.64312	.99732
Cook United, Inc.	1.63756	1.50997
Federated Dept. Stores, Inc.	.71199	.98952
Gamble-Skogmo	1.08281	.64785
King's Dept. Stores	1.54088	1.14081
Macy (R.H.) & Co.	1.13212	1.09411
Marshall Field & Co.	.87469	.89565
May Department Stores Co.	.89353	.97794
Mercantile Stores Co., Inc.	.61048	1.06893
Outlet Co.	1.34506	1.08363
Penney (J.C.) Co.	.74463	.88212
Scoa Inds., Inc.	1.35671	.94898
Sears, Roebuck & Co.	.63148	.70401
Vornado, Inc.	1.56629	1.56501
Allied Supermarkets	1.30497	1.46365
American Stores Co.	.82336	.93630
Borman's, Inc.	.91606	1.54569
Food Fair, Inc.	.83663	.71694
Great Atlantic & Pac. Tea Co.	.58870	.74024
Kroger Co.	.78919	.87989
Lucky Stores, Inc.	.91706	.84008
National Tea Co.	.45201	1.22265
Pueblo Intl., Inc.	1.00610	1.11176
Safeway Stores, Inc.	.53855	.58231
Weis Markets, Inc.	.75517	.72426

TABLE A-30. Pre- and post-disclosure market risk measures (b_1 and b_2)--
Sample 4.

Company's name	b_1	b_2
Consolidated Foods Corp.	0.76786	0.81880
Greyhound Corp.	0.79531	0.52772
Beatrice Foods Co.	0.82910	0.73836
Borden, Inc.	0.68497	0.55474
Del Monte Corp.	0.56790	0.67836
Green Giant Co.	0.97287	0.79342
CPC Intl., Inc.	0.55905	0.63309
Archer-Daniels-Midland Co.	0.59427	0.44054
Fieldcrest Mills	0.95346	0.90703
Stevens (J.P.) & Co.	1.02535	0.73319
Bobbie Brooks, Inc.	1.53426	1.54114
Phillips Van Heusen	1.30361	1.54363
Crown Zellerbach	0.93099	0.76071
Federal Paper Board Co.	0.78950	0.86431
Fibreboard Corp.	0.99751	0.79968
Allied Chemical Corp.	0.94766	0.71747
Pennwalt Corp.	1.00740	0.87996
Airco, Inc.	1.07560	0.86777
Squibb Corp.	0.63833	0.65108
Helene Curtis Inds.	1.48225	1.72113
Insilco Corp.	1.21753	0.99762
Crompton & Knowles Corp.	0.94310	1.10259
Williams Cos.	1.24469	0.26766
Clark Oil & Refining Corp.	0.99676	1.18308
Phillips Petroleum Co.	0.68032	0.29697
Standard Oil Co. (Indiana)	0.53928	0.19755
Union Oil Co. of California	0.90148	0.28876
National Gypsum Co.	1.27416	0.85744
Cooper Tire & Rubber	0.75546	1.44368
Goodrich (B.F.) Co.	0.99420	0.92092
Uniroyal, Inc.	1.01815	0.99284
Melville Corp.	0.68360	1.38435
Texas Inds., Inc.	1.07778	0.92390
Crane Co.	1.03844	0.73173
American Hoist & Derrick Co.	1.20132	1.10247
Unarco Inds., Inc.	1.17788	0.76494
Leesona Corp.	1.56346	1.16474
NCR Corp.	0.94165	1.01471
Pitney-Bowes, Inc.	0.90752	1.06660
Scovill Mfg. Co.	1.25306	1.09162
Intl. Rectifier Corp.	1.71518	1.12118
Globe-Union, Inc.	1.39000	1.12874
TRW, Inc.	0.73940	1.02521

TABLE A-30. (continued)

Company's name	b ₁	b ₂
Fuqua Inds., Inc.	1.64799	1.55356
Milton Bradley Co.	1.15990	1.50719
Chessie System, Inc.	0.84945	0.45625
IC, Inds.	1.52621	1.03013
Kansas City Southern Inds.	1.08062	0.85533
SCO Line Railroad	1.05940	0.27683
Braniff Intl. Corp.	1.24583	1.50743
Eastern Air Lines	1.63499	1.46501
Pan American World Airways	1.32980	1.62748
Tiger International	1.93272	1.37095
UAL, Inc.	1.56737	1.03864
World Airways, Inc.	1.79861	1.50840
Foremost-McKesson, Inc.	0.81082	0.80461
Di Geiogio Corp.	1.37643	1.24901
Scot Lad Foods	1.20386	1.25457
Wickes Corp.	0.94276	1.29945
Allied Stores	1.26972	0.99606
AMFAC, Inc.	1.17815	0.83670
Assd. Dry Goods Corp.	0.94660	0.90711
Cook United, Inc.	1.63756	1.50997
Federated Dept. Stores, Inc.	0.71199	0.98952
Macy (R.H.) & Co.	1.13212	1.09411
May Department Stores Co.	0.89353	0.97794
Mercantile Stores Co., Inc.	0.61048	1.06893
Outlet Co.	1.34506	1.08363
Penney (J.C.) Co.	0.74463	0.88212
Sears, Roebuck & Co.	0.63148	0.70401
Zayre Corp.	1.30490	1.90428
Murphy (G.C.) Co.	0.93134	0.89885
Allied Supermarkets	1.30497	1.46365
American Stores Co.	0.82336	0.93630
Great Atlantic & Pac. Tea Co.	0.58870	0.74024
Lucky Stores, Inc.	0.91706	0.84008
National Tea Co.	0.45201	1.22265
Pueblo Intl., Inc.	1.00610	1.11176
Weis Markets, Inc.	0.75517	0.72426
Edison Brothers Stores	1.07115	0.81758
Howard Johnson Co.	1.12214	1.49416
Thrifty Corporation	1.05059	1.04087
Walgreen Co.	1.12352	0.74164
Holiday Inns, Inc.	1.17714	1.56758
Webb (Del E.) Corp.	1.44026	1.69326
IU Intl. Corp.	1.08720	0.95013
Katy Inds.	1.41601	1.23287
LTV Corp.	2.18444	1.24833
Whittaker Corp.	1.96231	1.61249

APPENDIX B

EFFECTS OF LEASE CAPITALIZATION ON REPORTED EARNINGS

As mentioned in Chapter III, capitalization of leases which are presently reported in the footnotes to the financial statements can result in either an increase or a decrease in reported earnings. The purpose of this appendix is to illustrate how the reported earnings are affected by lease capitalization.

Accounting Methods for Lessees

Assume that ABC Company on January 1, 1970, leased equipment from a leasing firm for 10 years at an annual rate of \$50,000 payable at the beginning of each year. Additionally, assume that the equipment leased had an economic life of 10 years and that the interest rate charged by the lessor as being implicit in the lease terms was 8 percent. If the lessee did not capitalize the lease, the lessee would have recorded the lease using the operating method. On the other hand, if the lease was considered a capital (financing) lease, the financing method of reporting lease transactions would have been followed by the lessee. The operating method and the financing method of recording leases by lessees are further discussed below.

The operating method. Under the operating method, each lease payment is treated as an expense for the current year. In the above example, the ABC Company would charge \$50,000 to its income statement as

an operating expense each year throughout the ten-year period. No recognition would be given on the balance sheet of an asset for the rights associated with the use of the equipment or a liability for the obligations assumed under the lease contract.

The financing method. A more complex accounting procedure is used to record a lease transaction according to the financing method which is appropriate for capitalized leases. Under this method, the lease would be considered a means of financing the acquisition of the equipment. Thus, the ABC Company would be required to (a) set up an asset account and a liability account, and (b) recognize depreciation on the asset and gradual liquidation of the liability with interest. In the example, the present value of the lease payments at the inception of the lease was \$362,344.40. This amount would be recorded, on January 1, 1970, by ABC as a noncurrent asset with the corresponding liability.

For each year during the life of the lease, ABC would record a depreciation expense on the asset. If the straight-line method was used the annual depreciation expense would be \$36,234.44. In addition, the Company would record as an interest expense an amount equal to 8 percent of the balance in the liability account. For the year 1970, for instance, the interest expense amounted to \$24,987.55 (8 percent x [\$362,344.40 - \$50,000]). The difference between the annual lease payment and the computed interest expense is treated as a reduction in the lease obligations. A complete schedule of lease payments, depreciation expenses, interest expenses and the net effects (before taxes) on reported earnings for the entire lease term is shown in Table B-1.

TABLE B-1. Schedule of interest expense, depreciation expense, reductions in lease obligations and effect on earnings--ABC Company.

Year	(1) Lease payment	(2) Depreciation expense	(3) Interest on unpaid obligations	(1) - (3) Reduction of lease obligations	(1)-(2)-(3) Effects on reported earnings
1	\$ 50,000	\$ 36,234.44	\$ 24,987.55	\$ 25,012.45	\$-11,221.99
2	50,000	36,234.44	22,986.55	27,013.45	- 9,220.99
3	50,000	36,234.44	20,825.48	29,174.52	- 7,059.92
4	50,000	36,234.44	18,491.52	31,508.48	- 4,725.96
5	50,000	36,234.44	15,970.84	34,029.16	- 2,205.28
6	50,000	36,234.44	13,248.52	36,751.48	517.04
7	50,000	36,234.44	10,308.39	39,691.61	3,457.17
8	50,000	36,234.44	7,133.06	42,866.94	6,632.50
9	50,000	36,234.44	3,703.69	46,296.31	10,061.87
10	50,000	36,234.44	-0-	50,000.00	13,765.56
	\$500,000	\$362,344.40	\$137,655.60	\$362,344.40	\$ -0-

The operating versus the financing methods. As can be noted from Table B-1, an equal amount of lease payment (\$50,000) is charged to the income statement annually during the term of the lease under the operating method. Under the financing method, however, the income statement is charged with (a) the depreciation expense, and (b) the interest expense. In Table B-1, the sum of these two items is greater than the annual lease payment during the first five years of the lease term. This is reversed during the last five years of the lease term.

Because of the differential effects of the two accounting methods on the income statement, a lessee may report either a negative or a positive impact from capitalizing leases depending mainly on whether the change from footnote disclosure to capitalization occurs relatively early or late in the life of the lease. It should be noted, however, that the total lease payments are exactly equal to the total depreciation expenses plus total interest expenses during the lease term.

The above example has been simplified to facilitate the discussion of differences between the two accounting treatments of leases. While it is apparent that interest and depreciation expense replace rent expense when leases are capitalized, the dollar magnitude of the impact varies, depending on the particular situation. Any changes in the assumptions implicit in the illustration will affect the specific differences noted between the alternative accounting treatments. Important variables which will affect specific differences in income between capitalization and non-capitalization include provisions for variable rent payments, depreciation methods and periods used, and the company's general

scope of leasing activity (i.e., a company increasing its use of leasing will more likely experience a net negative effect of lease capitalization on its net income than another company whose scope of leasing activity is stable or decreasing).

VITA

Surasakdi Bhamornsiri (Sak) was born in Thonburi, Thailand, on January 2, 1944. He attended Bangkok College before coming to the United States to continue his education in 1967. He received in 1969 a Bachelor of Science degree in Business Administration and in 1971 a Master of Business Administration degree from Middle Tennessee State University, Murfreesboro, Tennessee.

Between 1971 and 1974, Mr. Bhamornsiri worked for Cummings, Inc., Nashville, Tennessee, as a financial analyst and a corporate accountant. He entered the Doctoral program at The University of Tennessee, Knoxville, in 1974.

While pursuing his Doctorate at Tennessee, Mr. Bhamornsiri served as a graduate teaching and research assistant in the Department of Accounting and Business Law. He was a recipient of The University of Tennessee Price Waterhouse Fellowship and a member of Beta Alpha Psi. He was also a member in the American Accounting Association and the National Association of Accountants.

Mr. Bhamornsiri's extra-curricular activities in college included two terms as the President of the Student Body and a three-time badminton champion at Bangkok College, the President of the Thai Student Association at Middle Tennessee State University, and the Secretary of the DBA Student Association at The University of Tennessee, Knoxville.