AN EMPIRICAL EXAMINATION OF THE EFFECTS OF FASB STATEMENT NO. 52 ON SECURITY RETURNS AND REPORTED EARNINGS OF U.S.-BASED MULTINATIONAL CORPORATIONS

DISSERTATION

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

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By

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Prior to the issuance of Financial Accounting Standards Board Statement No. 8 (SFAS No. 8), there was a marked inconsistency in the area of accounting for foreign currency translation. Though designed to make the diverse accounting practices of multinational corporations (MNCs) more compatible, SFAS No. 8 was the subject of a great deal of criticism, eventually leading to the issuance of Financial Accounting Standards Board Statement No. 52 (SFAS No. 52). SFAS No. 52 differs from SFAS No. 8 on objectives and method of translation, and on accounting treatments of translation adjustments. This dissertation provides an empirical examination of the security market reaction to the accounting policy change embodied in SFAS No. 52, and its impact on the volatility of reported earnings of MNCs.

The effects of the issuance and early adoption of SFAS No. 52 on security return distributions were determined by both cross-sectional comparisons of cumulative average residuals (CAR) between MNCs and domestic firms and between early and late adopters, and by time-series tests on CAR of MNCs. Two volume analyses were performed to test the
effects of SFAS No. 52 on security volume. The first analysis was adjusted to remove the effects of the market-wide factors on volume, and the second analysis was unadjusted for the market influences. Four nonparametric tests were used in testing the effects of SFAS No. 52 vis-a-vis SFAS No. 8 on the volatility of reported earnings of MNCs.

The findings of this study led to the following conclusions: (1) SFAS No. 52 had significantly affected security returns of MNCs, but had no significant effects on security volume of MNCs; (2) the early adoption of SFAS No. 52 had no effects on security returns and volume of early adopters as opposed to late adopters; and (3) SFAS No. 52 did not have any significant effects on the volatility of reported earnings of MNCs. However, the impact of exchange adjustments on MNCs' earnings under SFAS No. 52 was significantly affected by the size of foreign operations and industry classifications.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF ILLUSTRATIONS</td>
<td>v</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>I. BACKGROUND AND STATEMENT OF THE PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>The Purpose of the Research</td>
<td></td>
</tr>
<tr>
<td>Organization of the Study</td>
<td></td>
</tr>
<tr>
<td>Chapter Bibliography</td>
<td></td>
</tr>
<tr>
<td>II. CONCEPTUAL ISSUES IN FOREIGN CURRENCY TRANSLATION</td>
<td>11</td>
</tr>
<tr>
<td>Determinants of Exchange Rate</td>
<td></td>
</tr>
<tr>
<td>Foreign Exchange Exposure</td>
<td></td>
</tr>
<tr>
<td>Needs for Translation</td>
<td></td>
</tr>
<tr>
<td>Objectives of Translation</td>
<td></td>
</tr>
<tr>
<td>Translation Methods</td>
<td></td>
</tr>
<tr>
<td>The Nature and Accounting Treatment of Translation Gains and Losses</td>
<td></td>
</tr>
<tr>
<td>Accounting Promulgations on Foreign Currency Translation</td>
<td></td>
</tr>
<tr>
<td>Chapter Bibliography</td>
<td></td>
</tr>
<tr>
<td>III. PRIOR RESEARCH</td>
<td>69</td>
</tr>
<tr>
<td>Theoretical and Empirical Studies Prior to SFAS No. 52</td>
<td></td>
</tr>
<tr>
<td>Empirical Studies on the Effects of SFAS No. 8 on Security Market Prices and Reported Earnings</td>
<td></td>
</tr>
<tr>
<td>Empirical Studies on the Effects of SFAS No. 52 on the Translation of Foreign-Currency Financial Statements</td>
<td></td>
</tr>
<tr>
<td>Chapter Bibliography</td>
<td></td>
</tr>
<tr>
<td>IV. RESEARCH METHODOLOGY</td>
<td>91</td>
</tr>
<tr>
<td>Research Hypotheses</td>
<td></td>
</tr>
<tr>
<td>Research Design</td>
<td></td>
</tr>
<tr>
<td>Data Gathering and Variable Measurements</td>
<td></td>
</tr>
<tr>
<td>Sample Selection</td>
<td></td>
</tr>
<tr>
<td>Research Models</td>
<td></td>
</tr>
<tr>
<td>Chapter Bibliography</td>
<td></td>
</tr>
</tbody>
</table>
Chapter

V. ANALYSIS AND INTERPRETATION OF TEST RESULTS 133

Analysis and Interpretation of the Market Reaction to SFAS No. 52
Analysis and Interpretation of the Market Reaction to the Early Adoption of SFAS No. 52
Analysis and Interpretation of Effects on Volatility of Reported Earnings of MNCs

Chapter Bibliography

VI. LIMITATIONS, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH 193

Summary
Limitations of the Study
Conclusions
Recommendations for Future Research

APPENDIX 209

BIBLIOGRAPHY 212
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Comparison of Exchange Rates Used Under Four Translation Methods</td>
<td>39</td>
</tr>
<tr>
<td>II. Summary of Remeasurement and Translation Needs</td>
<td>56</td>
</tr>
<tr>
<td>III. Comparison of the Major Features of SFAS No. 8 and SFAS No. 52</td>
<td>62</td>
</tr>
<tr>
<td>IV. MNCs Included in the Test Sample</td>
<td>108</td>
</tr>
<tr>
<td>V. Frequency Distribution of Test Sample Firms by Industry</td>
<td>112</td>
</tr>
<tr>
<td>VI. Frequency Distribution of Control Sample Firms by Industry</td>
<td>113</td>
</tr>
<tr>
<td>VII. Frequency Distribution of Test Sample Firms by Size of Foreign Sales and Foreign Assets</td>
<td>114</td>
</tr>
<tr>
<td>VIII. Frequency Distribution of Foreign Exchange Adjustments</td>
<td>115</td>
</tr>
<tr>
<td>IX. Comparative Statistics on Sales and Total Assets of Test and Control Firms</td>
<td>116</td>
</tr>
<tr>
<td>X. Various Test Periods</td>
<td>130</td>
</tr>
<tr>
<td>XI. Possible Results of the Comparisons of Return and Volume Distributions of Test and Control Firms</td>
<td>134</td>
</tr>
<tr>
<td>XII. Results of the Cross-Sectional Test on Security Returns (Total Test Firms vs Total Control Firms)</td>
<td>137</td>
</tr>
<tr>
<td>XIII. Summary Results of Tests on Average Residuals of Test Group Firms</td>
<td>139</td>
</tr>
<tr>
<td>XIV. Mean Volume ($V_t$) of Test and Control Firms</td>
<td>143</td>
</tr>
<tr>
<td>Table</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>XV. Tests of Differences in the Means and Variances of Volume Distributions of Test and Control Firms</td>
<td>144</td>
</tr>
<tr>
<td>XVI. Analysis of Weekly Mean Volume Residual of Test Sample Firms</td>
<td>148</td>
</tr>
<tr>
<td>XVII. Analysis of Weekly Mean Volume Residual of Control Sample Firms</td>
<td>149</td>
</tr>
<tr>
<td>XVIII. Analysis of Mean Volume Residual (Adjusted for Market Influences)</td>
<td>154</td>
</tr>
<tr>
<td>XIX. Summary Results of Test on Weekly Volume Residuals of Test Group Firms</td>
<td>155</td>
</tr>
<tr>
<td>XX. Results of the Cross-Sectional Test on Monthly Return (Early Adopters vs Late Adopters)</td>
<td>159</td>
</tr>
<tr>
<td>XXI. Results of Tests on Average Residuals</td>
<td>161</td>
</tr>
<tr>
<td>XXII. Mean Volume ($\bar{V}_T$) of Early and Late Adopters</td>
<td>164</td>
</tr>
<tr>
<td>XXIII. Tests of Differences in the Means and Variances of Volume Distributions of Early and Late Adopters</td>
<td>165</td>
</tr>
<tr>
<td>XXIV. Analysis of Weekly Mean Volume Residual</td>
<td>169</td>
</tr>
<tr>
<td>XXV. Summary Results of Comparison of Weekly Volume Residuals (Early Adopters vs Late Adopters)</td>
<td>172</td>
</tr>
<tr>
<td>XXVI. Summary Results of Test on Weekly Volume Residuals of Early and Late Adopters</td>
<td>173</td>
</tr>
<tr>
<td>XXVII. Results of Tests on the Effect of Exchange Adjustment as a Percentage of Operating Income on the Volatility of Earnings</td>
<td>178</td>
</tr>
<tr>
<td>XXVIII. Comparison of Pre and Post-SFAS No. 52 Earnings Volatilities for Test Group Firms</td>
<td>179</td>
</tr>
<tr>
<td>Table</td>
<td>Page</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>XXIX. Results of Test on the Effects of the Size of Foreign Assets on Volatility of Earnings of MNCs</td>
<td>182</td>
</tr>
<tr>
<td>XXX. Results of Test on the Effects of Size of Foreign Sales on Volatility of Earnings of MNCs</td>
<td>185</td>
</tr>
<tr>
<td>XXXI. Results of Test on the Effects of Industry Classifications on Volatility of Earnings</td>
<td>189</td>
</tr>
</tbody>
</table>
## LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The Relative PPP Theory</td>
<td>16</td>
</tr>
<tr>
<td>2.</td>
<td>The International Fisher Effect</td>
<td>19</td>
</tr>
<tr>
<td>3.</td>
<td>Research Design</td>
<td>95</td>
</tr>
<tr>
<td>4.</td>
<td>Weekly Average of the Daily Percentage of Shares Traded of Test and Control Sample Firms</td>
<td>146</td>
</tr>
<tr>
<td>5.</td>
<td>Weekly Mean Volume Residual of Test and Control Firms</td>
<td>153</td>
</tr>
<tr>
<td>6.</td>
<td>Weekly Average of the Daily Percentage of Shares Traded of Early and Late Adopters</td>
<td>166</td>
</tr>
<tr>
<td>7.</td>
<td>Weekly Mean Volume Residual</td>
<td>171</td>
</tr>
</tbody>
</table>
CHAPTER I

BACKGROUND AND STATEMENT OF THE PROBLEM

Accounting for foreign currency translation is considered one of the more fundamental and complex accounting issues confronting multinational corporation (MNC, hereafter). The involvement of many U.S. firms in foreign operations has expanded substantially in recent years. With the advent of floating foreign currency exchange rates in 1971, a number of difficult and possibly insoluble problems have arisen on the issue of foreign currency translation.

It is, however, the monetary upheavals of the last few years, marked by the devaluation of the pound in 1967, the floating of the Canadian dollar in 1970, the suspension of the convertibility of the U.S. dollar and its devaluation in 1971, and the floating of other major currencies against the dollar and against each other that have focused the attention of accountants and corporate controllers on the need to re-examine accounting practices that were found generally acceptable in less complex times (2, p. 43).

Most of the issues revolve around two fundamental accounting questions: at what rate of exchange should foreign operations be translated, and what should be done with the amount relating to the effect of a change in the exchange rate?

A number of different methods of translation have been advocated and applied in practice. Pakkala (10) reported that by the early 1970's MNCs were using an array of methods to translate the foreign currency statements of internation-

The objective of foreign currency translation as stated in SFAS No. 8 is

... to measure and express (a) in dollars and (b) in conformity with U.S. generally accepted accounting principles the assets, liabilities, revenue, or expenses that are measured or denominated in foreign currency (5, par. 6).

The objective of SFAS No. 8 is consistent with a U.S. dollar orientation. That is, foreign-currency-denominated assets, liabilities, revenues, and expenses are reported as if originally recorded in U.S. dollars. This objective has been criticized for leading to unreal differences between earnings measured in translated dollars and those reported by the foreign operations. Miller (8) criticized the objective of SFAS No. 8 and the FASB for choosing "...to account for MNC operations using branch-accounting concepts" (8, p. 153).

The requirements of SFAS No. 8 have also been widely criticized by corporate leaders, financial analysts and
academicians. Most of the criticism centered around the following points: the translation of long-term debt, the translation of inventory, the recognition of foreign exchange gains and losses in the quarterly and annual income statement, the appropriate translation method, and the responses of investors and management to the financial statement impact of SFAS No. 8. Many critics claimed that SFAS No. 8 caused increased volatility of reported earnings and did not reflect the underlying economic reality of foreign operations because of the abnormality of financial results and relationships. Hence investors were supposedly misled, resulting in lowered security prices and suboptimal decisions by management made solely to counteract the effect of SFAS No. 8 on reported earnings (3, 7, 12).

In May 1978, the FASB requested comments from constituents concerning its first twelve statements. Eighty-eight percent of the comments received requested that the Board reconsider SFAS No. 8. In August 1980, the FASB issued an Exposure Draft of a proposed replacement for SFAS No. 8. Over 400 comments were received by the Board, one of the largest responses ever to a proposed accounting standard. In June 1981, the FASB issued a revised Exposure Draft, which was adopted as amended and issued as Statement of Financial Accounting Standards No. 52, "Foreign Currency Translation" (SFAS No. 52, hereafter), in December 1981.
SFAS No. 52 changes the means of accounting for foreign currency operations. It adopts a foreign currency orientation rather than a U.S. dollar orientation. That is, foreign-currency-denominated assets, liabilities, revenues, and expenses are assumed to be measured in foreign currency, and then translated into U.S. dollars for reporting purposes.

According to SFAS No. 52, translation should accomplish the following objectives.

(a) Provide information that is generally compatible with the expected economic effects of a rate change on an enterprise's cash flows and equity.

(b) Reflect in consolidated statements the financial results and relationships of the individual consolidated entities as measured in their functional currencies in conformity with U.S. generally accepted accounting principles (6, par. 4).

To achieve these objectives, SFAS No. 52 introduces the concept of the "functional currency" to determine the recognition of foreign currency translation gains and losses. It accepts multiple measurement bases in consolidated financial statements on the premise that individual foreign subsidiaries operate and generate cash flows in a number of separate economic environments, each having a specific functional currency. The functional currency approach calls for translation of all functional currency assets and liabilities into U.S. dollars at the current
exchange rate if the local currency is designated as the functional currency. The use of the current rate is assumed to resolve both the economically incompatible results and operating margins distortions associated with SFAS No. 8. The resultant adjustments are to be reported as an equity adjustment on the balance sheet in an attempt to alleviate the volatility of earnings distortion associated with SFAS No. 8. If the U.S. dollar is designated as the functional currency, the translation process is essentially the same as under SFAS No. 8.

The issuance of SFAS No. 52 was received warmly by several corporate executives and financial analysts. They believed that SFAS No. 52 would significantly reduce the alleged fluctuations in earnings and adverse security return distributions. Evidence of this warm reception is exemplified by the following excerpts from a study conducted by Coopers and Lybrand (4):

Management feels the accounting change will better reflect financial results, relationships of operations and expected economic conditions as is reported using local foreign currency financial statements. It will also reduce the volatility of earnings reports as was caused by the previous accounting rules (4, p. 20).

We welcome the new standard, because we believe that by removing from reported earnings nearly all "paper" or unrealized currency effects, it more clearly reflects our real operating performance (4, p. 24).

and
Under the old rules, the effects of fluctuating foreign currency exchange rates on translating international balance sheets from local currencies into dollars were included in the income statement, sometimes causing wide swings in earnings that did not fairly reflect the economic performance of the company...the earnings now more clearly present a true indication of the economic operating realities of the company (4, p. 20).

SFAS No. 52 became effective for fiscal years beginning on or after December 15, 1982, although earlier application was encouraged. It was anticipated that most MNCs would be in agreement with the new standard. However, this does not appear to be the case. In a study conducted by Bindon (1), the majority of the MNCs surveyed was in favor of the requirements of SFAS No. 52, but the majority was not as large as might have been anticipated in light of the intense criticism which was directed against SFAS No. 8.

The FASB adopted SFAS No. 52 by a four-to-three vote. Three Board members voiced a strong dissent to its issuance. The dissenters criticized the statement, among other issues for, (a) adopting objectives that are at variance with the single entity and single unit of measure concepts which underlie consolidated financial statements, and (b) making an unwarranted reporting distinction between exchange gains and losses and translation adjustments. The dissenters recommended that the basic underlying rules of SFAS No. 8 be retained, with the exception that locally sourced inventory to be translated at the current rate (6, pp. 15-16).
Selling and Sorter (13) also criticized SFAS No. 52 for contaminating the existing accounting model "with a translated number that defies logical interpretation in terms of cash flow" (13, p. 69). They support the temporal method as applied in SFAS No. 8, but advocate that translation gains and losses be excluded from income. Other critics assert that SFAS No. 52 is not consistent with the concept of comprehensive income adopted by the FASB in its conceptual framework (9, 11).

The Purpose of the Research

With the issuance of SFAS No. 52, the FASB hoped to have finally resolved the problems inherent in translating foreign currency financial statements. It has been predicted that the stock prices of MNCs would be favorably changed by the issuance of SFAS No. 52, since the accounting changes caused by SFAS No. 52 would reduce the fluctuations in reported earnings and change the foreign currency risk management practices of MNCs.

SFAS No. 52 differs significantly from SFAS No. 8 on the objectives and methods of translation, accounting treatment of translation adjustments, and the nature of accounting exposure. The primary purpose of this study is to provide an empirical investigation of the economic effects of that divergence on the security return distributions and
volume behavior in the capital market, and on the reported earnings of MNCs. Specifically, the purpose is to study, for MNCs affected by SFAS No. 52:

(1) The association of the announcement or implementation of SFAS No. 52 and security return distributions and security volume behavior.

(2) The information content associated with the early compliance with SFAS No. 52.

(3) The impact on the volatility of reported earnings that was associated with SFAS No. 8.

(4) The impact of industrial classification, size of foreign assets and size of foreign revenue on the volatility of reported earnings.

Organization of the Study

Chapter I introduces the problem and purposes of the study. Chapter II presents a detailed discussion of conceptual issues that are relevant to this study. Chapter III presents a review of relevant literature and prior work. Chapter IV presents the research methodology. Chapter V analyzes and interprets the data results. Chapter VI includes the limitations, conclusions, and recommendations for future research.
CHAPTER BIBLIOGRAPHY


CHAPTER II

CONCEPTUAL ISSUES IN FOREIGN CURRENCY TRANSLATION

Translation of foreign currency operations has assumed greater importance since 1973 when the floating exchange rate system was established. The floating system ended the old fixed exchange rate system that was established in 1944 based on the Bretton Woods Agreement. Under this system, temporary fluctuations in exchange rates were controlled by the intervention of central banks in the foreign exchange markets. If fluctuations in exchange rates appeared permanent, reflecting supply and demand, then exchange rates were adjusted through currency devaluations. The lag between changes in market conditions and the adjustments of exchange rates allowed profitable speculation against central banks and made the system inefficient which ultimately led to the demise of the Agreement in 1973. Under the floating exchange rate system, currencies are floated against each other in terms of their exchange rates, which are determined by market forces and may sharply fluctuate every day resulting in possible large exchange gains or losses.

A research study conducted by Scott and Troberg (51), indicated that the most important of eighty-eight international accounting problems are those of exchange rate changes and accounting for foreign currency translation.
In a world of shifting exchange rates, it is difficult to measure the economic effect of exchange rate changes on a particular company having dealings with foreign affiliates or other foreign operations or the net effect of these rate changes on a system of interrelated companies in different countries; in some circumstances the swings in the parities of currencies are largely unrelated to the operations of affiliated companies in that country (51, p. 18).

The turmoil in the international monetary system has made the topic of foreign exchange rates, their effect on the measurement of assets and liabilities, and their effect on the determination of earnings a matter of continuing concern to MNCs and the accounting profession. The effects of changes in foreign exchange rates mostly depend on the objectives of translation adopted and the translation method used. This chapter addresses the intricate nature of foreign exchange rates, objectives of and needs for translation, and accounting promulgations on foreign currency translation.

Determinants of Exchange Rates

Conceptually, a foreign exchange rate may be viewed as the price of one currency expressed in terms of another currency at a specific point in time and according to specific contractual terms of transfer. At any given time, however, several quotes for an exchange rate between two currencies may typically be found: spot and forward rates, bid and offer rates, and preferential and official rates. The
The existence of several exchange quotations depends on such factors as: (1) the type of exchange market (official market, black market, or convenience market), (2) the market sector in which currencies are traded (retail, wholesale, foreign, or supranational), (3) the type of foreign exchange instruments involved (currencies, bank transfer, bill of exchange, letters of credit, or forward contracts), (4) delivery times specified (immediate or future delivery), and (5) central banks' interference (preferential or discriminatory rates) (49, pp. 119-141).

Foreign exchange rates are designed to facilitate the actual conversions of currencies. Fluctuations of exchange rates represent the interpretations of all the expectations within the international financial markets. Many theories have attempted to identify the forces that influence those markets, and to explain the mechanism that determines foreign exchange rates. Three of these theories are reviewed below. They are:

1. The Purchasing Power Parity (PPP) Theory.
2. The International Fisher Effect.
3. The Forward Rate Theory of Exchange Rate Expectations.

**Purchasing Power Parity (PPP) Theory**

The PPP theory explains the relationship between the general price levels in two countries and the equilibrium
exchange rate between their currencies. The foundation of the PPP theory is simply that the purchasing power of a currency is determined by the amount of goods and services that can be purchased with a unit of this currency. The exchange rate between two currencies should provide the same purchasing power for each currency. If PPP does not exist between the two currencies, the exchange rate will adjust until PPP prevails.

The direction of the line of causation, however, has been the subject of debate in the economic literature. Yeager (57) and Officer (42) argue that the PPP theory asserts that the line of causation is stronger from price levels to the exchange rate. That is, the causal variables are price levels and the determined variable is the exchange rate. Keynes, Samuelson, and other economists, on the other hand, have pointed to the fact that there are chains of causation running from exchange rates to price levels (42, p. 17).

The PPP theory has an absolute PPP form and a relative PPP form. According to the absolute PPP form, the equilibrium exchange rate is the ratio of price levels in the two countries involved. This relationship may be stated as follows:

\[ X_t = \frac{PL^a_t}{PL^b_t} \]
where:

\[ X_t = \text{the rate of exchange between the currency of country A and the currency of country B in period } t; \]

\[ PL_a^t = \text{the price level in country A in period } t; \text{ and} \]

\[ PL_b^t = \text{the price level in country B in period } t. \]

There are a number of factors that may prevent the absolute PPP form from determining exchange rates. Some of these factors are: (1) the existence of trade restrictions, (2) the existence of short-term speculation and long-run capital movements, (3) structural changes in the economies involved, and (4) the unavailability of absolute price levels ([42, pp. 13-14]).

According to the relative PPP form, the changes in the equilibrium exchange rates are determined by the relative movement in price levels. This relationship may be expressed as follows:

\[ X_t = \frac{(PL_b^t / PL_b^{t-1})}{(PL_a^t / PL_a^{t-1})} X_{t-1} \]

where:

\[ X_t, t-1 = \text{exchange rate at time } t \text{ and } t-1 \text{ (number of units of country B's currency per unit of country A's currency)}; \]

\[ PL_a^t, t-1 = \text{price level in country A in period } t \text{ and } t-1; \]
\( PL^b_{t', t-1} = \text{price level in country B in period } t \text{ and } t-1. \)

This relationship is graphically illustrated in Figure 1. The PPP function is represented by the 45 degree line which intersects the vertical and horizontal axes. For each price level relationship, such as \( P_1 \), there is an exchange rate relationship, such as \( R_1 \). When the prices of country B's goods rise at a greater rate than those of country B, the result is a shift in relative price changes from \( P_1 \) to \( P_2 \). The demand for country A's goods increases while the demand for country B's goods decreases in both countries and in

\[ \begin{align*}
\text{FIGURE 1} \\
\text{THE RELATIVE PPP THEORY} \\
\end{align*} \]

\[ \begin{align*}
\text{Change in Exchange} \\
\text{Rate} \\
(R = \frac{X_t}{X_{t-1}}) \\
\end{align*} \]
other countries as well. Assuming that country B's currency is floating freely in the foreign exchange market, the shift in demand leads to a continuous increase in the number of units of country B's currency per unit of country A's currency until the change in the exchange rate is proportional to changes in price levels, i.e., $R_2$.

Several empirical studies have attempted to validate the PPP theory. Giddy (28), Aliber and Stickney (1), Levich (34), Porter (45), among others, found a poor correlation between changes in exchange rate and changes in relative prices in the short run. However, a greater clustering around the PPP line has been found for longer periods of time. The longer the period, the more closely the relative PPP theory holds.

An implication of the PPP theory holds for all commodities, exchange gains and losses and changes in local prices on nonmonetary assets are offsetting and nonmonetary items are thereby not exposed to foreign exchange risk (56, p. 52).

**International Fisher Effect**

The International Fisher Effect explains the relationship between the level of interest rates on comparable assets denominated in different currencies and anticipated changes in exchange rate between these different currencies.
The Fisher Effect states that the relative difference in interest rates on comparable financial assets denominated in different currencies will equal the anticipated changes in exchange rates during the interval until the maturity of the two financial assets. The Fisher Effect can be stated as follows:

\[
E \left( \frac{X_t - X_{t-1}}{X_{t-1}} \right) = r^a_{t-1} - r^b_{t-1}
\]

where:

- \(X_{t-1}\) = the rate of exchange between the currency of country A and the currency of country B at time \(t\) and \(t-1\);
- \(r^a_{t-1}\) = the interest rate on country A's currency-denominated securities at time \(t-1\); and
- \(r^b_{t-1}\) = the interest rate on country B's currency-denominated securities at time \(t-1\).

The rational for the International Fisher Effect is that the demand and supply of foreign exchange are affected by investors or security transactions when funds are moved between currencies to profit from the interest rate differentials or from anticipated changes in exchange rates. From the investors' viewpoint, financial assets denominated in currencies expected to depreciate will be held only if interest rates on those assets are sufficiently high to compensate for the expected currency depreciation. Investors will also hold financial assets which carry interest rates
lower than those on other assets only if the financial assets held are denominated in currencies expected to appreciate in value. These relationships are illustrated in Figure 2. The International Fisher Effect is represented by the 45 degree line. When the International Fisher Effect holds, relative differences in interest rates on similar assets equals the anticipated rate of change of the exchange rate.

Giddy (27) stated that since the International Fisher Effect is an ex ante expectations hypothesis involving an unknown, \( E(X_t) \), it is not subject to direct empirical testing. The realized or ex post outcome of \( X_t \) will always differ from \( E(X_{t-1}) \). Aliber and Stickney (1) indicated that a systematic deviation between the anticipated and observed

![Figure 2: The International Fisher Effect](image)
exchange rate changes might be the result of the existence of "currency preferences". That is,

Investors might prefer to hold assets denominated in certain currencies because the value of these currencies is expected to fluctuate less in the future than other currencies. A currency premium would develop and the interest rate differential would systematically differ from anticipated changes in the exchange rate (1, p. 55).

The implication of the International Fisher Effect to the translation of foreign currency balance sheets is that, if the Fisher Effect holds, borrowers in a weak currency tend to pay high interest rates. These interest expenses need to be combined with translation gains when the currency is devalued to give the real interest rate. This implies that at least a portion of the foreign exchange gains or losses on long term receivables and payables are anticipated and reflected in the difference in the nominal interest rates (10, p. 28). Thus, contractual cash flows would not, in the long run, be subject to translation gains or losses.

**Forward Rate Theory of Exchange Rate Expectations**

The forward rate theory of exchange rate expectations attempts to explain the relationship between the values of the forward exchange rates and the values for the spot exchange rates on the maturity dates of these forward contracts. According to this theory, the forward exchange rate provides the best forecast of the future spot rates.
Giddy (27) stated that the rational for the forward rate theory is that traders and investors who believe that the forward exchange rate is above their prediction of the future spot rate will sell the foreign currency forward, bidding down the forward exchange rate until it equals the expected future spot rate. Investors and traders who believe that the foreign currency is undervalued in the forward market will buy foreign currency forward, bidding up the forward exchange rate until it reaches the expected spot rate (27, p. 890). This relationship may be stated as follows:

\[ F_{t-1} = \mathbb{E}(X_t) \]

where:

- \( F_{t-1} \) = the forward exchange rate at time \( t-1 \); and
- \( X_t \) = the expected future spot rate.

The forward rate theory of exchange rate expectations is not directly or indirectly supported by empirical evidence. Mayer, et. al. (37) point to the fact that a forward contract is not likely to predict accurately the spot rate on the dates when the forward contract matures because the large number of unforeseen disturbances between the dates when investors buy forward contracts and the dates on which these contracts mature (37, pp. 509-510).
Foreign Exchange Exposure

Changes in foreign exchange rates subject the MNC to foreign exchange exposure. Foreign exchange exposure is usually classified into accounting exposure and economic exposure.

Accounting Exposure.--Accounting exposure may be defined as the exchange adjustment that results from the need to translate foreign currency financial statements into the reporting currency for financial reporting purposes. An item is considered to bear accounting exposure if it is translated at the current exchange rate, the rate which is in effect at the balance sheet date. An item is considered unexposed if it is translated at the historical exchange rate, the rate which is in effect when the item was acquired. If a foreign subsidiary has exposed net assets, it will be susceptible to translation losses when the foreign currency falls in value.

The extent of translation gains and losses is determined by accounting standards such as SFAS No. 8 and SFAS No. 52. Under SFAS No. 8, a translation gain or loss is measured by reference to the net monetary position of the foreign subsidiary. On the other hand, SFAS No. 52 redefines the accounting exposure and recognizes that what is at risk from changes in foreign exchange rate is the net investment in a foreign operation when the foreign currency is the functional currency.
Economic Exposure.--Economic exposure may be defined as the effects of changes in foreign exchange rates on future cash flows and the value of the MNC. The extent of economic exposure is determined by the MNC's position in its products and factors markets. There is no general agreement on the precise definition or methods of measurement of the economic exposure faced by an MNC when exchange rates change. It is difficult to measure since the effect of changes in exchange rates will be reflected in successive future income statements.

The nature and accounting treatment of foreign exchange exposure have been one of the most controversial and often misunderstood aspects of accounting for international operations. Evans, et. al. (19) stated that there is real confusion regarding whether foreign exchange exposures have any effect on the MNC's cash flows, whether they are realized or unrealized, and what is the timing of their eventual realization. Aliber and Stickney (1), for example, argued that exchange rates fluctuations subject MNCs to potentially important risks, and measuring the exposure to the risk of losses from exchange rates fluctuations is "...an important input into the decision whether the risk should be avoided, neutralized, or carried" (1, p. 44). Giddy (28) and Miller (38), among others, on the other hand, argued that the effect of exchange rate fluctuations is often more apparent
than real, and the risks can be easily diversified away by the MNC.

Needs for Translations

The objectives and methods of foreign currency translation should be evaluated on the basis of their abilities to fulfill the perceived needs for translation. Following is a discussion of the four general needs for foreign currency translation.

Recording of Transactions Denominated in a Foreign Currency

A U.S. firm may enter into a variety of transactions such as the import or export of goods and services; foreign lending or borrowing; and payment or receipt of dividends, royalties and consulting fees. If the transaction is denominated in U.S. dollars, there are no accounting problems in recording such transactions. However, if the transaction is measured and denominated in a foreign currency, it must be translated into U.S. dollars, using some exchange rate, before it can be recorded. In such case, the U.S. firm needs to resolve the following accounting problems: (1) the selection of exchange rate to be used for the translation, (2) the treatment of any exchange gains and losses, and (3) the recording of settlement of foreign currency receivables.
and payables (8, pp. 88-89). How these problems are resolved depends on the firm's perspective.

A one-transaction perspective is described in SFAS No. 8 as follows:

A transaction involving purchase or sale of goods or services with the price stated in foreign currency is incomplete until the amount in dollars necessary to liquidate the relaxed payable or receivable is determined...an exchange gain or loss related to the transaction should be treated as an adjustment of the cost of imports or revenue from exports (24, par. 113).

The two-transaction perspective, on the other hand, treats foreign currency receivables and payables as separate from the sale or purchase transactions that gave rise to them. The foreign exchange gains or losses resulting from translating the receivables or payables at the current rate is not used to adjust from the export or the cost of the import.

**Preparation of Consolidated Financial Statements**

Under the U.S. generally accepted accounting principles, financial statements in U.S. dollars of a company's subsidiary are required for preparation of combined or consolidated financial statements, for computing the parent company's equity in net assets and earnings of foreign subsidiaries accounted for by the equity method, and for providing supplemental information about investments in foreign subsidiaries accounted for at cost (5, par. 14). This
requirement is intended to provide information to external users of financial statements about the economic entity as a whole.

There are conceptual problems related to translation of foreign currency statements into U.S. dollars prior to the preparation of consolidated financial statements. Some of these problems are: (1) which of the multiple exchange rates should be used, (2) how should the resulting foreign exchange gain or loss be treated, (3) should the underlying transactions also be measured in dollars, that is, as if they had been occurred in the United States, (4) should the relative price levels within the foreign countries be considered, and (5) should the same procedures be required of all U.S.-based MNCs regardless of the different particular situations possible--such as operations in countries with unstable currencies (38, p. 146).

**Directing and Evaluating Foreign Operations**

An MNC must translate a foreign subsidiaries' financial data to satisfy its own internal needs. First, translated foreign financial statements are needed to aid the management of the MNC to effectively coordinate, integrate and manage global operations. Second, management of U.S.-based MNCs, accustomed to thinking in dollars, seem to prefer to use translated foreign currency financial statements to
evaluate foreign subsidiaries' operations. The evaluation process often involves comparisons with other foreign or domestic operations. However, there are some problems inherent in or created by the use of translated financial statements in evaluating foreign operations. Miller (38) addresses the following questions:

Do financial statements lose their relevance when examined outside the context of their particular domiciles?

Do translation gains and losses reflect changes in the economic values of foreign assets?

Can or should translation procedures attempt to make foreign operations identical to those conducted in the United States?

Can any translation procedure yield relevant data with which to evaluate multiple operating purposes? (38, p. 146).

Third, translated foreign currency financial statements are used to evaluate the performance of foreign management. However, evaluating the foreign managers should be based on the degree of authority to protect the subsidiary's investment in U.S. dollars from erosion by exchange rate changes.

Providing Information to External Users of Consolidated Statements

External users of financial statements concerning translated results of foreign subsidiaries are provided with information to enable them to evaluate foreign operations and foreign management. However, concern has been expressed
that users of consolidated financial statements may be misled, unless the foreign currency statements are adjusted for any differences that may exist in the accounting principles employed by the different countries (38, p. 148).

It can be seen that translation of foreign currency financial statements is a necessity. Different translation methods have been used to satisfy these needs for translation. However, the objectives of translation, which are considered as intermediate steps selected to satisfy the needs for translation, should be discussed before a brief description of each translation method is provided.

Objectives of Translation

The objectives of translation should follow from the objectives of financial reporting, because translation of foreign currency statements is intended to facilitate presentation of financial reports. The basic objectives of financial reporting as stated by the FASB in its Statement of Financial Accounting Concepts No. 1 (21) are to provide information

...that is useful to present and potential investors and creditors and other users in making rational investments, credit, and similar decisions (21, par. 34).

...to help present and potential investors and creditors and other users in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest and the proceeds from the sale, redemption, or maturity of securities or loans (21, par. 37).
about an enterprise's financial performance during a period (21, par. 42).

The FASB has also chosen in its Statement of Financial Accounting Concepts No. 2 (22) to affirm that qualitative characteristics will be used for the purpose of accounting standard establishment. The FASB argues that comparability and representational faithfulness are desirable qualitative characteristics of financial statements (22, par. 63-80).

It is assumed, therefore, that accounting representation of economic events arising from fluctuations in the foreign exchange rates should faithfully describe the events, and it is also assumed that translated foreign currency financial statements should be comparable to the financial statements of the U.S. parent firms and other domestic corporations.

The Committee on International Accounting of the American Accounting Association (2) indicated that the objective of translation is to represent to decision-makers the foreign investment operations in a familiar currency framework, and where relevant, to facilitate comparison with domestic and other foreign investments and operations. Seidler (52) viewed the objective of translation as the need to translate foreign accounts under a method which attempts to measure the effects of changes in exchange rate on the dollar value of the future earnings streams from foreign subsidiaries. Scott (50) stated that the objective of translation should
be to report foreign currency resource values in the context of the local economy in which these resources will be employed to generate a stream of future earnings since it is this earning stream which is to be predicted.

The objective of translation under SFAS No. 8 was to measure in U.S. dollars, and in conformity with U.S. generally accepted accounting principles, the accounts of the foreign subsidiary as though the foreign subsidiary operated in the U.S. economic environment. Critics of this objective argued that it failed to recognize the fact that the operations of foreign subsidiaries exist in other environments and involve foreign currency cash flows in those other environments. Thus, the accounting results after translation do not faithfully portray the foreign currency cash flows. Furthermore, critics argued that SFAS No. 8 caused increased volatility in reported earnings and did not reflect the underlying economic reality of foreign operations because it altered the after-translation financial statement relationships from those reflected in the foreign currency financial statements. If the volatility in reported earnings is artificial, and if financial statement relationships are altered, the objective of SFAS No. 8 and the consequences of adopting its rules are at variance with the objectives of financial reporting as stated in the Statement of Financial Accounting Concepts No. 1.
Nance and Roemmich (40), however, have a different view of the objective and the translation method of SFAS No. 8. The authors used the FASB's qualitative characteristics of accounting information to make a rational choice from among the various methods of translation. After balancing representational faithfulness to economic values and comparability with domestic accounting measures, they concluded that the translation method adopted by SFAS No. 8 is a preferable and satisfactory method for the translation of historical cost-based financial statements (40, p. 46). The authors based their conclusion on the fact that the historical cost accounting model is based on measurement of identifiable assets and changes in identifiable assets. Changes in currency exchange rates may have different economic impact on a firm as a whole than on the identifiable assets of this firm. They stated that,

For this reason, representational faithfulness is applied only to the impact of economic events on the identifiable assets of a firm, not to the impact of economic events on the firm as a whole (40, p. 31).

Selling and Sorter (53) also supported the objective and rules of SFAS No. 8 on the basis that the SFAS No. 8's temporal method preserved existing accounting logic, that is, "if it is proper to quantify an item in terms of past flow, it would also seem appropriate to quantify that item at the exchange rate that existed when the past flow took
place" (53, p. 65). They believe that SFAS No. 8 represents a theoretically sound way of dealing with foreign currency translation and better serves the needs of users of financial statements in assessing the inherent risk of foreign operations and changes in foreign currency exchange rates.

The primary objectives of SFAS No. 52 are to provide information that is generally compatible with the expected economic effects of an exchange rate change on an enterprise's cash flows and equity, and to reflect in consolidated statements the results and relationships of the individual subsidiaries as measured in their functional currencies in conformity with generally accepted principles. The emphasis on cash flows and equity is to insure that the reporting standard reflects greater economic reality than was previously achieved under SFAS No. 8. Under SFAS No. 52, the objectives of the translation process appear to be more compatible than those of SFAS No. 8 with the objectives of financial reporting stated in Statement of Financial Accounting Concepts No. 1. Apparently, the FASB believes that SFAS No. 52 will provide users of financial statements with information that is more useful for economic decision-making than that provided by SFAS No. 8.

Critics of SFAS No. 52, however, argue that the translation of foreign-currency-denominated historical cost items at current exchange rates may be considered to result in a
figure that is neither a meaningful description of past cash flows nor a description of future flows (53, p. 64). Using qualitative evaluation of translation methods as the basis of fidelity to economic valuation and comparability with domestic accounting reports, Nance and Roemmich (40) claim that "the adoption of current rate in SFAS No. 52 was a move from a preferred method to an inferior one" (40, p. 47).

Translation Methods

Prior to the issuance of SFAS No. 8 in 1975, four translation methods were widely used in the United States, either in pure form or with some variations. Each of these methods was a normative approach. That is, a standard was established to be followed in all cases, regardless of circumstances. A brief description of each method follows.

Current/Noncurrent Method. The current/noncurrent method is the oldest method officially approved for use in the United States by the American Institute of Certified Public Accountants (AICPA). It was initially adopted in 1930 and was recommended in the Accounting Research Bulletin No. 43, Chapter 12 in 1953.

Under the current/noncurrent method, current assets and current liabilities are translated at the foreign exchange rate which exists at the balance sheet date; noncurrent assets, noncurrent liabilities and owners' equity are
translated at the rate in effect when each transaction occurred; revenues and most expenses are translated at the average rate applicable to each month; and depreciation and amortization expenses are translated at the same rate as the corresponding balance sheet items.

The theory behind the current/noncurrent method is that accounts should be grouped according to maturity. Short-term accounts are considered more vulnerable to changes in foreign exchange rates than long-term accounts and, therefore, translation gains and losses depend on the change in the net working capital position of the foreign subsidiary.

The exceptional treatments of inventory, long-term debt, and common stock and fixed assets pointed up the conceptual weaknesses of this method. Deupree (14) and Anderson, et. al. (7) indicated that the exceptions to the general rule were so great that the soundness of the entire approach had to be seriously questioned.

Monetary-Nonmonetary Method. The monetary-nonmonetary method was originated by Hepworth (29) in 1956. He suggested that accounts be translated according to their nature rather than the date of maturity. The National Association of Accountants (41) advocated Hepworth's recommendation in its report No. 36.

Under this method, monetary assets and monetary liabilities are translated at the exchange rate in effect at the
balance sheet date, and nonmonetary assets and liabilities and owners' equity are translated at historical rates. All income statement items are translated at average exchange rates (usually monthly average), except for items relating to nonmonetary assets and liabilities, which are translated at historical rates.

The theory behind this method is that the value of monetary assets and liabilities represents a fixed amount of money and parent currency equivalent is deemed to change each time the exchange rate changes. Those amounts, therefore, should be translated at the current exchange rate. In 1965, the Accounting Principles Board (4) partially acknowledge the translation of assets and liabilities on the basis of attributes instead of time by allowing long-term debt to be translated at current rates.

The Temporal Method. The temporal method of translation was originally proposed by Leonard Lorensen (35) in Accounting Research Study No. 12. Proponents of the temporal method claim that it translates assets and liabilities of foreign subsidiaries in a way that retains the accounting principles used to measure them in the foreign currency financial statements. The emphasis of the temporal method is on the measurement of attributes rather than on classification of accounts. This objective is achieved by applying the fair value principle. That is, a U.S. dollar can be
approximated for each foreign currency price by multiplying the foreign currency price by the exchange rate in effect at the date to which the foreign currency price pertains. Thus, the attributes of nonmonetary items measured are retained. With regard to monetary items, however, the translation process under the temporal method does in fact change the attributes of monetary items and the accounting principles used to measure them in the foreign currency statements.

Under the temporal method, assets and liabilities are classified according to their basic temporality. Items carried at present or future prices are translated at the exchange rate existing on the balance sheet date. Items carried at past prices are translated at historical rates. Translation of inventory depends on its valuation method. Inventory carried at cost is translated at historical rates, whereas inventory carried at market is translated at current rates.

Under current generally accepted accounting principles of historical cost accounting, the temporal method provides essentially the same results as the monetary/nonmonetary methods. However, there are some minor differences between the two methods. Two examples of those differences are: (1) marketable securities carried at cost would be translated at the historical rate under the temporal method and
at the current rate under the monetary/nonmonetary method, and (2) stock valued at net realizable value would be translated at the current rate under the temporal method and at the historical rate under the monetary/nonmonetary method.

Current Rate Method. The current rate method has long been preferred by European MNCs and accountants. The International Accounting Standards Committee (30) also favored this method. Since it requires that all assets and liabilities be translated at the current exchange rate, the current rate method is easier to use than others because MNCs would not have to keep track of various historical exchange rates. Under this method, all assets, liabilities, revenues, and expenses are translated at current rates. Only owners' equity accounts are translated at historical rates, hence only the net equity of each foreign subsidiary is assumed to be exposed to foreign exchange risk.

The current rate method adopts a foreign currency orientation, which implies that the relative magnitudes of the various accounts in the U.S. dollar statements are the same as in the original foreign currency statements. The proponents of this method argue that this method preserves the local perspective, which allows one to see in dollars the same relationships that exist in the local currency where revenues are earned and expenses paid. They maintain that it is illogical to treat transactions "as if" they
originally occurred in U.S. dollars when in fact they did not (8, pp. 105-106). Mariscato (39) argued that the current rate method should be used for performance evaluation in MNCs because transactions actually occurred in the local currency.

Critics of the current rate method claim that the use of current exchange rate to translate past measures is technically wrong. According to Clarke (12), current rates cut across the canons of arithmetical calculations in general and of monetary calculations in particular. This method was also criticized for the inclusion of items measured at past prices in foreign currency statements and translated at current rates in U.S. dollar statements. According to SFAS No. 8, that represents a departure "from historical-cost-based accounting because inventory, property, plant, equipment, and other assets normally carried at cost are reflected at varying dollar amounts resulting from changes in rates" (24, par. 135). Those dollar amounts do not represent measures of historical cost or current cost; they are mixed and hard to interpret (33, p. 51).

Comparison of Translation Methods. The exchange rates used to translate the various balance sheet items under the four translation methods reviewed earlier are shown in Table I.
TABLE 1

COMPARISON OF EXCHANGE RATES USED UNDER FOUR TRANSLATION METHODS

<table>
<thead>
<tr>
<th></th>
<th>Current/Noncurrent</th>
<th>Monetary/Nomnonetary</th>
<th>Temporal</th>
<th>Current Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>*CR</td>
<td>CR</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Marketable Securities</td>
<td>CR</td>
<td>CR</td>
<td>*HR or CR</td>
<td>CR</td>
</tr>
<tr>
<td>Current Receivables</td>
<td>CR</td>
<td>CR</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Prepaid Expenses</td>
<td>CR</td>
<td>HR</td>
<td>HR</td>
<td>CR</td>
</tr>
<tr>
<td>Inventories</td>
<td>CR</td>
<td>HR</td>
<td>HR or CR</td>
<td>CR</td>
</tr>
<tr>
<td>Fixed Assets</td>
<td>HR</td>
<td>HR</td>
<td>HR</td>
<td>CR</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>CR</td>
<td>CR</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Deferred Charges</td>
<td>CR</td>
<td>HR</td>
<td>HR</td>
<td>CR</td>
</tr>
<tr>
<td>Long-Term Debt</td>
<td>HR</td>
<td>CR</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Owners' Equity</td>
<td>HR</td>
<td>HR</td>
<td>HR</td>
<td>HR</td>
</tr>
</tbody>
</table>

*CR = Current Exchange Rate and HR = Historical Exchange Rate.

The Nature and Accounting Treatment of Translation Gains and Losses

One of the most controversial issues in foreign currency translation has been the nature and accounting treatment of translation gains and losses. The controversy concerns whether or not translation gains and losses have any effect on the MNC's cash flows, and the timing of their eventual realization.
Patz (43) describes the nature of translation gains and losses (translation adjustments) as follows:

Since the measurement approach involves measurement of an attribute (remittable domestic currency value) not measured pretranslation, any such adjustments arising from translation must by definition be measures of gain or loss of that attribute occasioned by changes in the exchange rate (43, p. 317).

Patz indicates that realization is not really an issue since it is remittable domestic currency value being measured, and the rate change itself constitutes the objectively determined critical event and appropriate signal of periodic gains or losses.

Copeland and Ingram (13) presented two views of the nature of the translation gains and losses, which correspond to the two views of earnings measurement included in the FASB Discussion Memorandum (20) on conceptual framework for financial accounting and reporting. Advocates of the "asset/liability" view maintain that each asset in the balance sheet should be a financial representation of an economic resource of the enterprise and each liability should be a financial representation of an obligation of the enterprise to transfer resources to another entity (20, par. 54). According to Copeland and Ingram, unrealized translation gains and losses represent changes in the enterprise's resources or obligations at the balance sheet date, and, therefore, they must be recognized in current period income.
statements to preserve the integrity of the balance sheet. Copeland and Ingram (13) are of the opinion that since the major concern of the "revenue/expense" view is to achieve proper matching of costs with revenues, it does not require recognition of unrealized translation gains and losses or, at most defers them if they are recognized at all (13, p. 16). SFAS No. 8 adopted the asset/liability view and required the immediate recognition of unrealized translation gains and losses.

According to SFAS No. 52, two views of the nature of translation gains and losses are held by assenting members of the FASB. The first view is described in terms of a parent company with the dollar as the reporting and functional currency, and a foreign subsidiary with a functional currency other than the dollar. According to this view, a change in the exchange rate between the dollar and the other currency produces a change in the dollar equivalent of the net investment although there is no change in the net assets of the other entity measured in its functional currency. However, that change in the dollar equivalent of the net investment is an unrealized enhancement or reduction, having no effect on the functional currency net cash flows generated by the foreign entity which may be currently reinvested or distributed to the parent (25, par. 113).

This view regards translation adjustments as an unrealized component of comprehensive income and should be reported separately from net income, and should be accumulated as a part of owners' equity.
The second view of the nature of translation gains and losses considers the translation adjustments as a mechanical by-product of the translation process (25, par. 114). According to this view, the translation adjustments for a period should be excluded from net income and reported separately as a separate component of equity.

The three most frequently used accounting treatments for translation gains and losses are the all-inclusive income method, the deferral method, and the owners' equity adjustment method. A brief description of each method follows.

All-inclusive Income Method. Under the all-inclusive income method, translation gains and losses should be recognized in current net income. This method makes these a determinant of periodic net income because exchange rate changes are a fact of life and translation gains and losses are normal for MNCs. Some disagreement exists, however, as to whether translation gains and losses should be included in income from operations or as a part of extraordinary items. Advocates of the "clean income concept" support the disclosure of translation gains and losses as part of extraordinary items or in a completely new section following income from operations. Kubin (32) argues that since having operations in various countries is part of the MNCs' normal way of doing business, translation gains and losses do not
qualify as extraordinary items even if they are the largest single amount that turns a profit into a loss or vice versa (32, p. 77).

The Deferral Method. The deferral method is based on the realization principle, which requires that unrealized translation gains and losses should be recognized as deferred charges or credits until they are realized over the life of the asset or liability that gave rise to the translation gains or losses. A variation of the deferral method, based on the concept of conservatism, includes unrealized translation losses in the current net income, but defers unrealized translation gains.

The Equity Adjustment Method. This method is based on a combination of the realization principle and the going-concern assumption. This method necessitates a distinction between unrealized translation gains and losses that are expected to be realized by the going concern and unrealized translation gains and losses that will only be realized upon sale or liquidation of the foreign subsidiary. The equity adjustment method is similar to the approach adopted in SFAS No. 52.

In the study conducted by Copeland and Ingram (13), the three accounting treatments for translation gains and losses were empirically tested to determine the translation effects of the patterns occurring in foreign exchange rates since
the issuance of SFAS No. 8. The authors concluded that the deferral method appeared to be the most satisfactory accounting alternative because it was capable of producing both the best approximation of the liquidation values of exchange transactions and the least distortion in a firm's earnings performance. The deferral method was also the only method which met the primary objectives of both the asset/liability view and the revenue/expense view of the conceptual framework (13, pp. 20-26).

A research study conducted by Evans, Folks, and Jilling (18), indicated that 51.3 percent of the respondent firms recognized translation gains and losses in current income, 37.2 percent deferred translation gains and losses based on certain criteria, 0.6 percent adjusted owners' equity, and 1.3 percent amortized translation gains and losses over the life of long-term debt (18, p. 148). These treatments were found in the United States before the issuance of SFAS No. 8, which was a period of uncertainty in accounting for MNCs and many of the treatments were acceptable.

Accounting Promulgations on Foreign Currency Translation

The problem of foreign currency translation has been addressed by all three authoritative accounting bodies in the United States in the past fifty years. Following is a discussion of the major accounting promulgations on the subject of foreign currency translation.
Accounting Research Bulletin (ARB) No. 43

In June 1953, the American Institute of Accountants issued its ARB No. 43 as a codification of the forty-two prior accounting research bulletins. Chapter 12 of ARB No. 43 was devoted to the topic of financial statements of foreign operations intended for consolidation with U.S. firms. It recommended the use of the current/noncurrent translation method.

Regarding the treatment of foreign exchange gains and losses, Chapter 12 of ARB No. 43 made a distinction between realized and unrealized exchange gains and losses. Any realized exchange gains or losses should be charged to income from operations. Regarding unrealized gains and losses, Chapter 12 of ARB No. 43 stated that,

... provision should be made, ordinarily by a charge against operations, for decline in translation value of foreign net current and working assets (unrealized losses). Unrealized gains should preferably be carried to a suspense account, except to the extent that they offset prior provisions for unrealized losses, in which case they may be credited to the account previously charged (3, par. 11).

Chapter 12 was criticized for the exceptional treatment of inventory, long-term debt, and exchange gains and losses, and for failing to consider the fundamental objective of the process of foreign currency translation (7, pp. 52-56).
Accounting Principles Board (APB) Opinion No. 6

In October 1965, the APB issued its Opinion No. 6, which was considered as an official move toward accepting the monetary/nonmonetary method. APB No. 6 modified ARB No. 43 by allowing the translation of long-term debt and receivables at current rate in many circumstances.

APB No. 6 failed to mention at which rate inventory should be translated, therefore, current exchange rates were still applied under Chapter 12 of ARB No. 43 (as opposed to historical rates under monetary/nonmonetary method).

Deupree (14) pointed out that APB No. 6 "made no attempt to specify the circumstances in which it is appropriate to use the current exchange rates, and it appears to have been interpreted generally as sanctioning unrestricted use of the current exchange rate for noncurrent receivables and payables" (14, p. 50). Nevertheless, APB No. 6, in conjunction with ARB No. 43, gave an official recognition to a method which was called a "quasi-monetary-nonmonetary" method (16, p. 42).

Statement of Financial Accounting Standards No. 1

In December 1973, the FASB issued Statement of Financial Accounting Standards No. 1, "Disclosure of Foreign Currency Translation Information" (SFAS No. 1, hereafter). SFAS No. 1 did not establish any new standard, but it
indicated that until the FASB could resolve the issue of foreign currency translation with a uniform standard, it required MNCs to disclose their accounting policies concerning currency translation as well as the following amounts:

The aggregate amount of exchange adjustments originating in the period, the amount thereof included in the determination of income and the amount thereof deferred.

The aggregate amount of exchange adjustments included in the determination of income for the period, regardless of when the adjustments originated.

The aggregate amount of deferred exchange adjustments, regardless of when the adjustments originated, included in the balance sheet.

The amount by which total long-term receivables and total long-term payables translated at historical rates would each increase or decrease at the balance sheet date if translated at current rates.

The amount of gain or loss which has not been recognized on unperformed forward exchange contracts at the balance sheet date (23, par. 6).

SFAS No. 1 was intended to be a stopgap measure. The FASB believed that increased disclosure could serve as a temporary substitute for uniformity, and would allow investors to rearrange the numbers in order to make comparisons until a comprehensive accounting standard could be issued.

As stated in SFAS No. 1, improved disclosure of translation practices was needed because of (a) the continuing realignments of exchange rates, (b) the number of accounting
alternatives available, (c) the diversity of practices, (d) the lack of specific disclosure requirements in existing accounting pronouncements, and (e) the limited amount of information concerning translation practices being disclosed by some firms with important foreign operations. This fact can be found in the annual survey conducted by the AICPA (6), which showed that only 80 firms (from 600 firms surveyed) disclosed the amount of translation adjustments. While 164 other firms disclosed information regarding their translation policies, they did not disclose the amount of gains and losses from translation.

**SFAS No. 8**

Prior to the issuance of SFAS No. 8, a number of different methods of translation were applied in practice, translation gains and losses were treated in various ways, and a consensus regarding the appropriate exchange rate to be used did not exist. To reduce the diversity of methods and practices, the FASB issued SFAS No. 8 to achieve standardization of translation practices and reporting requirements.

SFAS No. 8 required the use of temporal method of translation. The major provisions of this statement were as follows:

1. Cash, receivables, and payables are translated at the current exchange rates.
(2) Assets and liabilities carried at past exchange prices are translated at historical exchange rates.

(3) Assets and liabilities carried at present or future exchange prices are translated at current exchange rates.

(4) Income statement items are translated at average exchange rates, which approximate the actual historical rates at which the transactions occurred, except that revenues and expenses that relate to assets and liabilities translated at historical rates should be translated at historical rates.

(5) All foreign exchange gains and losses, whether realized or not, should be recognized in the income statement in the period in which they occur—quarterly as well as annually (24, par. 7, 12, 13, 16, 17).

A unique aspect of SFAS No. 8 was the valuation of inventory according to the lower of cost or market. At the level of the foreign subsidiary, it is common to value ending inventory at the lower of foreign currency cost or market. However, the test is made in U.S. dollars for translation purposes. Therefore, cost translated at historical rates is compared with market translated at the current exchange rate to determine the lower of cost or market in U.S. dollars.

SFAS No. 8 was a product of considerable efforts by the FASB to resolve the problems of foreign currency translation. Miller (38), one of SFAS No. 8's critics, admits that the statement is logically sound and it "represents the best-structured analysis made by the FASB or any of its predecessors to date" (38, p. 153). SFAS No. 8 was also
praised for putting an end to the inconsistency in accounting for foreign currency translation. Prior to 1975, American MNCs were using a variety of translation methods to account for their foreign operations. This could have caused difficulties in the comparison of financial statements of MNCs in a meaningful way. Another advantage claimed for SFAS No. 8 is that it showed the volatility of the foreign currency fluctuations that exist in a world of floating exchange rates so that users of financial statements could assess the inherent risk of foreign operations.

Aside from these advantages, SFAS No. 8 was the subject of a great deal of criticism, eventually leading to the issuance of its replacement, SFAS No. 52. Following are some of the alleged problems created by SFAS No. 8.

Unnecessary Volatility of Reported Earnings. One of the major criticisms of SFAS No. 8 is the inclusion of foreign exchange gains and losses in determining net income for the period in which the exchange rate changes. Critics claimed that the inclusion of unrealized translation gains or losses in reported earnings resulted in a wide fluctuations in MNC's reported earnings (particularly quarterly earnings) which did not necessarily reflect economic reality and that investor understanding of MNC's financial statements was retarded. Further, Radebaugh (47), Shank (54), and Copeland and Ingram (13), among others, pointed out that
the wide fluctuations in reported earnings are artificially created because many of them represent unrealized translation gains and losses which are offset in subsequent interim periods and would never be realized, especially for independent autonomous foreign subsidiaries with local financing. It has been claimed that the resultant distortions of reported earnings contradict the SFAS No. 8's primary objective that the translation process should not affect the measurement bases for balance sheet items or the timing of recognition of income statement items. Critics also contended that the inclusion of unrealized gains and losses in reported earnings may be construed by the market as economic effects rather than accounting effects, even though the FASB indicated in the discussion to SFAS No. 8 (24, par. 96-110) that it is not trying to measure the economic effect of exchange rate changes (11, p. 49).

**Adverse Effects on Security Prices.** The inclusion of unrealized exchange gains and losses in reported earnings has caused a wide fluctuations in the quarterly earnings of a number of MNCs, causing some executives and authors to believe that the volatility of reported earnings adversely affected an MNC's share prices in the stock market. According to Snyder (55),

Executives have been grumbling that this new procedure increases the volatility of their company's reported profits, confuses investors and
consequently, puts a damper on stock prices (55, p. 85).

Although they lacked empirical support, some critics indicated that the distortion of reported earnings would hamper the investors' ability to assess the distributions of future values of MNCs' securities and would limit the investors' understanding of the financial statements of MNCs. Rodriguez (48), Dukes (15), Fredrikson and Mogus (26), among others, examined the effects of SFAS No. 8 on security return behavior and found that market prices for the common stock of MNCs have not been significantly affected by the requirements of SFAS No. 8.

**Economically Incompatible Results.** Critics of SFAS No. 8 argued that a strengthening foreign currency against the U.S. dollar should provide positive translated accounting results (i.e., gains) because foreign investments in such cases are enhanced. Thus, a foreign subsidiary should have more value as the local currency rises in value against the U.S. dollar because the foreign investment could be converted into more U.S. dollars. However, the opposite result is produced under SFAS No. 8 since it requires the translation of foreign currency debt at the higher current exchange rate while significant nonmonetary assets, such as plant, equipment, and inventory, are translated at lower historical exchange rates. Therefore, a net translation loss is in-
cluded in reported earnings despite an appreciated foreign investment. The critics argued further that the justification for reporting such translation loss is doubtful and questionable from an economic reality standpoint.

Suboptimal Management Decisions. Another criticism of SFAS No. 8 deals with foreign exchange risk. Managements of MNCs have engaged in foreign exchange actions to protect themselves from the possible consequences of reporting foreign currency adjustments in reported earnings. Critics argued that such actions could result in unfavorable economic consequences. That is, quarterly earnings can be protected from the variability caused by foreign exchange rate changes by making a number of economic decisions which are detrimental to the financial position of the firm. Arthur Young and Company (9), in a Client Memorandum, listed the actions taken by management of MNCs to reduce the exposure to SFAS No. 8 translation adjustments. MNCs have:

- increased hedging of foreign currency positions,

- changed the mix between local currency debt and U.S. debt,

- refinanced debt, including changing the currencies in which the debt is denominated, at higher cash borrowing cost,

- made more use of outside foreign currency consultants, and

- found that their foreign exchange risk management strategies have begun to impinge more seriously on decisions in other corporate activities, especially finance and marketing (9, p. 2).
Managements may also have taken actions to reduce the impact of SFAS No. 8 on reported earnings due to its effect on the reward structure of MNCs' management. Jain (31) pointed out that 18 out of 100 MNCs included in the study reported that managers' rewards were linked to the accounting effects of SFAS No. 8.

**SFAS No. 52**

SFAS No. 52 introduces two new concepts (the functional currency concept and the net investment concept) to determine the recognition of foreign currency translation gains and losses.

SFAS No. 52 defines functional currency as,

> the currency of the primary economic environment in which the entity operates; normally, that is the currency of the environment in which an entity primarily generates and expends cash (25, par. 162).

The primary economic environment can be either the country in which the foreign subsidiary is located, or the country of the parent company, or still a third country. If the foreign subsidiary is a self-contained entity that generates virtually all net cash flows in the local currency, the functional currency is typically the local currency. However, if the foreign subsidiary is merely an extension or an integral part of the parent company, the functional currency is the reporting currency, that is, the currency in which the parent company prepares its financial statements. If
the foreign subsidiary generates its net cash flow primarily within a third country, the currency of this third country is the functional currency. According to SFAS No. 52, the distinction between integrated and self-contained foreign subsidiaries is important because of the different economic effect of foreign exchange rate changes on their cash flows. The economic effect of exchange rate changes on fully integrated subsidiary concerns individual foreign-currency-denominated assets and liabilities, which have a direct bearing on the cash flows of the parent company. On the other hand, the economic effect of an exchange rate changes on a self-contained foreign subsidiary concerns the parent's net investment in this subsidiary, and translation gains or losses do not directly affect cash flows (25, par. 80-81).

Once the functional currency has been determined, the local currency financial records have to be measured in the functional currency if the local currency is not the functional currency. The rational for the remeasurement is to produce the same results as if the foreign entity's records had initially been kept in the functional currency and in conformity with generally accepted accounting principles of the country of the functional currency. Kubin (32, p. 68) summarizes the remeasurement needs as shown in Table II.

Once measured in the functional currency, SFAS No. 52 requires that all functional currency assets and liabilities
must be translated into the U.S. dollar at the current rate. Owners' equity is the only item that is translated at historical exchange rate. The logic behind translating all functional currency assets and liabilities at the current exchange rate is that a U.S. MNC is exposed to exchange risk to the extent of its net investment in a foreign subsidiary. According to SFAS No. 52, an asset that produces revenues in the functional currency can be an effective hedge of debt that requires payments in that currency. Therefore, functional currency assets and liabilities hedge one another, and what is at risk from foreign exchange rate fluctuations is the net assets (25, par. 94-95).

**TABLE II**

**SUMMARY OF REMEASUREMENT AND TRANSLATION NEEDS**

<table>
<thead>
<tr>
<th>Books Kept In</th>
<th>Functional Currency</th>
<th>Remeasurement</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Currency</td>
<td>Local Currency</td>
<td>Not Necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>Local Currency</td>
<td>Reporting Currency</td>
<td>Necessary</td>
<td>Not Necessary</td>
</tr>
<tr>
<td>Local Currency</td>
<td>Third-country Currency</td>
<td>Necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>Reporting Currency</td>
<td>Reporting Currency</td>
<td>Not Necessary</td>
<td>Not Necessary</td>
</tr>
</tbody>
</table>
SFAS No. 52 requires that all income statement items be translated at an appropriately weighted average exchange rate for the period. The foreign exchange gain and loss treatment part of SFAS No. 52 contains an array of treatments that result in a complex system. In general, realized gains and losses from transactions are included in income, whereas unrealized translation gains and losses are reported separately and accumulated in a separate component of consolidated stockholders' equity until the sale or the complete liquidation of the foreign net investment. But, if the temporal method is used, translation gains and losses from its use are included in net income.

One of the more debated issues in developing SFAS No. 52 was the translation of operations in highly inflationary economies. As indicated earlier, differences in the inflation rates among countries are one of the major factors causing changes in exchange rates. As Kubin (32) indicated, disregarding the offsetting effect between higher rates of inflation and corresponding devaluations of the inflationary economy's currency could result in distorted translations of foreign currency financial statements (32, pp. 70-71). SFAS No. 52, consequently, requires that the functional currency is the reporting currency of the parent company if the economic environment in which a foreign subsidiary is operating is highly inflationary. SFAS No. 52 defines a highly
inflationary economy as "...one that has cumulative inflation of approximately 100 percent or more over a 3-year period" (25, par. 11).

A fundamental problem arises with the functional currency concept and the use of current exchange rates whenever the functional currency is highly inflationary. This problem is referred to as "the disappearing asset" problem. The FASB has tried three different approaches to solve this problem in developing SFAS No. 52. First, the FASB ignored this problem in its initial Exposure Draft in August 1980. However, the FASB's position was objected to by most respondents to the 1980 Exposure Draft. Second, the FASB proposed in its second Exposure Draft in June 1981 that the financial statements of a foreign subsidiary with a highly inflationary functional currency should be restated to reflect changes in the general price level in the functional currency country prior to translation. This restate-translate approach was met with considerable objection even though it is theoretically sound. The primary objection to it was that,

The primary financial statements should not mix information presented in constant measuring units that reflect changes in the general price level with information presented in nominal monetary units (25, par. 106).

Finally, the FASB concluded in SFAS No. 52 that currencies of highly inflationary economies are not stable enough to
serve as the functional currencies, and therefore the "financial statements of a foreign entity in a highly inflationary economy shall be remeasured as if the functional currency were the reporting currency" (25, par. 11). Translation procedures are therefore similar to those set forth in SFAS No. 8 even if the foreign entity generates most of its net cash flows in the highly inflationary currency.

A unique provision in SFAS No. 52 was the three-year adoption window. The FASB encouraged MNCs to adopt SFAS No. 52 for their 1981, 1982, or 1983 operating results. The third year was mandatory. A study conducted by Evans and Folks (17), revealed that 87 of the 184 firms surveyed were early adopters of SFAS No. 52 prior to its effective date. The study indicated that the major factors favoring early adoption, in order of their importance, were (1) the impact on reported earnings for 1981, (2) the anticipated reduction in volatility of future reported earnings, (3) the exchange rate movements during 1981, (4) the anticipated impact on future reported earnings, (5) the impact on the equity accounts during 1981, and (6) the impact on debt-equity ratio and related loan covenants. The study confirmed the view that the main decision factors in those MNCs who early adopted SFAS No. 52 were income statement oriented.

SFAS No. 52 is expected to significantly reduce most of the alleged fluctuations of MNCs' earnings and the adverse
security returns, and reflect economic events rather than cause economic events as previously happened under SFAS No. 8. However, objections have been raised against SFAS No. 52, even by some members of the FASB. Following are some of the objections raised against SFAS No. 52.

**Inconsistency with Consolidation Theory.** According to the dissenting Board members, the adoption of multiple measurement bases in consolidated financial statements violates the single entity and single unit measure concepts that underlie consolidated financial statements. The FASB responded to this criticism by arguing that a true "single unit of measure" does not, as a factual matter, exist (25, par. 85).

**Violation of the All Inclusive/Clean Surplus Concept.** According to the all inclusive/clean surplus concept, all changes in equity, other than capital investments and distribution, should be reported in income. Critics argue that the reporting of translation gains and losses in the stockholders' equity rather than including them in net income is a clear violation of the clean surplus concept. They also argue that the FASB's reasoning for excluding translation adjustments from income, i.e., the uncertainty of the amount and timing of realization, is insufficient to justify the exclusion of translation adjustments from income (44, p. 11).
Manipulation of Financial Statements. According to Mathur and Loy (36), the possible existence of financial statement manipulations by MNCs under the requirements of SFAS No. 52 is a fear held by many critics. They noted that net income might be managed by the way transactions are conducted and reported and by the selection of the functional currencies. Another related criticism is that SFAS No. 52 may cause numerous year-to-year changes in the functional currency because of its requirement that the U.S. dollar be used as the functional currency in highly inflationary economies (19, p. 187).

Comparability Problems. Evans and Folks (17) indicated that SFAS No. 52 would cause problems of comparability of the results among firms, especially the comparability problems arising from the three-year adoption window. Some MNCs' management believed that SFAS No. 52 information would be less understandable than that provided by SFAS No. 8, and investors may be confused as to how they would interpret the cumulative translation account.

A Comparison between SFAS No. 8 and SFAS No. 52. The major features of SFAS No. 8 and SFAS No. 52 are compared in Table III.
<table>
<thead>
<tr>
<th>Feature</th>
<th>SFAS No. 8</th>
<th>SFAS No. 52</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translation Method</td>
<td>Temporal Method</td>
<td>Current Rate Method</td>
</tr>
<tr>
<td>Functional Currency Concept</td>
<td>Not applicable</td>
<td>The currency of the primary economic environment in which an equity generates and expends cash</td>
</tr>
<tr>
<td>Accounting Treatment of Translation Adjustments</td>
<td>Included in current income</td>
<td>Included in equity</td>
</tr>
<tr>
<td>Accounting Treatment of Gains and Losses from Foreign Currency Transactions</td>
<td>Included in current income</td>
<td>Included in current income</td>
</tr>
<tr>
<td>Translation in Highly Inflationary Economies</td>
<td>Temporal Method</td>
<td>Same as under SFAS No. 8</td>
</tr>
<tr>
<td>Realization of Translation Adjustments included in Equity</td>
<td>Not applicable</td>
<td>Realized upon sale or liquidation of the investment</td>
</tr>
</tbody>
</table>
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55. Snyder, L., "Have the Accountants Really Hurt the Multinationals?" Fortune, (February, 1977), 85-86, 89.

CHAPTER III

PRIOR RESEARCH

This chapter surveys the major theoretical and empirical research studies on accounting for foreign currency translation in financial reports of U.S.-based MNCs. The review is divided into three parts. The first part presents theoretical and empirical studies prior to the issuance of SFAS No. 8. The second part investigates the empirical studies on the effects of SFAS No. 8 on security market returns and reported earnings of MNCs. The third part discusses the empirical studies on the effects of SFAS No. 52 on the translation of foreign financial statements.

Theoretical and Empirical Studies
Prior to SFAS No. 8

Prior to the 1970s, accounting for foreign currency translation received little systematic study. Most of the empirical research studies conducted during this period have been accomplished primarily by surveys, questionnaires and interviews directed at the practices, methods of translation, and the adequacy of disclosure.

In one of the earliest studies in the field of foreign currency translation, Ashdown (2) described the reporting practices of American firms in regard to their foreign operations, specifically the translation of foreign currency
based financial statements into U.S. dollar based financial statements. In a study similar to Ashdown's, Lopata (13) described actual accounting practices as employed by American MNCs during 1935. Neither Ashdown's nor Lopata's study stated what accounting for foreign currency translation "should be," but rather focused on how MNCs actually translated foreign statements into U.S. dollars for inclusion in the U.S. parent company's consolidated financial statements.

Hepworth (11) described how foreign subsidiary operating results "should be" translated. He was critical not only of the current/noncurrent method of translation recommended in Chapter 12 of ARB No. 43, but also of the treatment of foreign exchange gains and losses used by MNCs at that time. Hepworth concluded that foreign currency translation should be accomplished by the monetary/nonmonetary method as opposed to the official recommendations of the accounting profession at that time. Hepworth believed that the current rate should be applied to monetary items, whereas nonmonetary items should be translated using the historical exchange rate. He reasoned that,

...more appropriate dollar amounts result from dividing asset and liability elements into those which are expressed in terms of a contractually determined number of foreign currency units as distinct from those which do not possess a directly determinable foreign currency magnitude (11, p. 203).
Hepworth also concluded that gains or losses from foreign exchange, although considered as an element of the operating results of foreign business, should be reported separately from the results of everyday business activities. Hepworth rejected the current/noncurrent method of translation on the basis that it produces results which are, at best, misleading, and upon closer examination, actually incorrect. The author identified two primary sources of error in the current/noncurrent method. First, current assets, as traditionally defined, do not represent a completely homogeneous group of items. Second, there is no fundamental difference between current accounts payable and long-term debt. Both represent contractual obligations to disburse a fixed number of foreign currency units (11, p. 9). Yet, the current/noncurrent method ignores this fact.

Although not a part of generally accepted accounting principles at that time, Hepworth's method of translation and the accounting treatment of translation gains and losses did influence current and future accounting practices.

The National Association of Accountants (17) examined the problems of applying basic accounting techniques where foreign operations are involved. The National Association of Accountants (NAA) conducted interviews with personnel of fifty-one U.S.-based MNCs. The recommendations of the NAA study coincided with those made by Hepworth. The two dif-
ferred only on the treatment of foreign exchange gains and losses. The NAA study supported the traditional approach of immediately recognizing all translation losses but deferring any net unrealized gains, whereas Hepworth recommended that all such gains and losses should be recognized currently.

The NAA study did not refer to the dichotomy as monetary/nonmonetary, but as financial/physical. Financial items include cash, accounts receivable, long-term debt and short-term debt. Physical items include fixed assets and inventory.

In a study sponsored by the AICPA, Lorensen (14) noted that during the crisis of 1971, many foreign exchange rates rose significantly whereas U.S. dollars rates has generally been falling. He stated that,

A misconception that accompanied the crisis was that rises in foreign exchange rates required different translation principles than falls in rates (14, p. xi).

Lorensen argued that a translation method should be suitable for all kinds of foreign exchange rate changes. A translation process changes the unit of measure from one defined in terms of foreign currency to one defined in terms of the U.S. dollars, but does not change the attribute measured. Thus, Lorensen argued, translation does not change any other accounting principle.

Lorensen argued that there is a similarity between general price-level accounting and foreign currency
translation in two aspects. "First, the unit of measure in financial statement is changed in both...Second, both change no other accounting principle used in preparing financial statements" (14, p. 13). On the issue of foreign exchange gains and losses, the author also argued that they are similar to general price-level gains and losses and should be accorded the same accounting treatment, that is, their recognition should not be deferred under any procedure (partial, direct or indirect).

Lorensen's study utilized deductive reasoning and the fair value principle in developing the temporal method of translation. In Chapter 4 of Accounting Research Study No. 12, he discussed the differences between the temporal method and the monetary/nonmonetary method. The author considered the monetary/nonmonetary method as an incomplete version of the temporal method. The results under the two methods coincide only because of the present framework of historical cost accounting system. Differences would arise under other accounting systems such as a system based on current value. Aggarwal and Baker (1) described Lorensen's method of translation as being "neutral" and claimed that it can accommodate different accounting systems.

Glover (9) surveyed the disclosure practices of forty-five U.S.-based MNCs as revealed by their 1972-73 financial statements. He noted the prevalence of a modified monetary/
nonmonetary translation method, with prepaid expenses and inventory translated at the current rate. The author also noted that all MNCs disclosed more information in 1973 than in 1972 due to the issuance of SFAS No. 1. However, he discovered that few MNCs had disclosed the existence of foreign exchange restrictions of any kind.

Glover concluded that the current rate method of translation is superior to both the current/noncurrent and the monetary/nonmonetary methods of translation, and it should be used to translate all assets and liabilities of foreign subsidiaries. He further concluded that a distinction should be made between gains and losses resulting from foreign exchange rate movements and those resulting from ordinary foreign operations.

Some of Glover's important recommendations are (1) MNCs should disclose any foreign exchange restrictions; (2) MNCs should disclose the geographical distributions of their foreign assets, liabilities, and earnings; and (3) there should be no special accounting treatment given to translation adjustments or gains and losses from foreign transactions. Most of Glover's recommendations have been adopted by SFAS No. 52 and the Security Exchange Commission release of 1982.
Empirical Studies on the Effects of SFAS No. 8 on Security Market Prices and Reported Earnings

Rodriguez (18) examined the impact of SFAS No. 8 on reported annual earnings for 1974 and 1975 of large U.S.-based MNCs. The time frame of the study forced her analysis to focus on only those MNCs which adopted SFAS No. 8 earlier than its effective date. Basically, she relied upon the annual reports of only 46 percent of her total sample size of 70 MNCs (in effect, the actual sample size was 32). The 70 firms selected were those MNCs with large foreign direct investments in countries that have allowed their currencies to fluctuate against the U.S. dollar during the 1970s (Japan, Europe, and Canada).

Rodriguez compared the earnings figure adjusted to comply with SFAS No. 8 with earnings based on the previously used method of translation. Her major findings were that in only 23 MNCs did SFAS NO. 8 have a "material" effect on reported earnings. In ten of those 23 MNCs, it had an impact of less than 5 percent of reported earnings. The author concluded that the adoption of SFAS No. 8 did not appear to have significantly changed the earnings reported by most U.S.-based MNCs. She also concluded that SFAS No. 8 took away the smoothing effect of reserve accounting, and it has made earnings more vulnerable to short-term changes in foreign exchange rates.
Rodriguez's generalizations, however, were based only upon annual reports of MNCs with large operations in Japan, Europe, and Canada that had applied SFAS No. 8 early in 1975. Griffin (10), in a review article, pointed out that Rodriguez's study is based on earnings of firms that had voluntarily adopted the statement earlier than its effective date. It is therefore possible that the MNCs surveyed are likely to be the least affected by the switch to SFAS No. 8. Rodriguez's study focused only upon annual net earnings and did not show the effect of foreign exchange rate changes on quarterly net earnings which are severely affected by those short-term fluctuations in exchange rates.

In a study sponsored by the FASB, Dukes (4) investigated the effects of the adoption of SFAS No. 8 on the security returns behavior of MNCs. Dukes concluded that the "issuance and implementation of FASB No. 8 does not appear to have significant detectable effects on the security returns of multinational firms" (4, p. 3).

Dukes selected an informational sample of 479 firms listed on NYSE which has security return data available from January 1965 through December 1976. Those firms were classified into six groups according to the monetary/non-monetary, current/noncurrent, and hybrid accounting methods of translation and by whether the exchange adjustments were included in current income or deferred by MNCs prior to the
adoption of SFAS No. 8. One possible error in Duke's classification, recognized by the author, is that MNCs in the period prior to 1974 could have been using different translation methods. Furthermore, the composition of portfolios in 1975 and 1976 was unchanged although about half the MNCs switched to the monetary/nonmonetary method in 1976. Therefore, his portfolios did not consist of MNCs using the same translation method in 1975 and 1976.

Dukes studied three test periods. They were (1) January 1968-December 1969, (2) January 1970-December 1974, and (3) January 1975-December 1976. The years 1968-1972, however, may not be appropriate control periods since SFAS No. 1 became effective on December 1973 and provided new disclosures beginning in 1973. The author compared the means of returns of test firms with those of control firms for a test on portfolios. He found no significant difference in each of the three test periods. He also used the market portfolio as a control and found significant differences between the market portfolio and MNCs in periods 1 and 2. However, Dukes found no significant differences in period 3. At the individual security level, the author used the Chow test to see whether the regression model's parameters had changed for the market model, and found no statistical differences in the model structure.
Dukes also compared the variability of return residuals of MNCs for 1975 and 1976, and again found no increase in the variability of return residuals. The Chow test results should be interpreted with caution, however, because about half the MNCs adopted SFAS No. 8 in the year 1975 which was included in the post-SFAS No. 8 period in the first three methods of analysis. Furthermore, any increase in the variability of return residuals due to SFAS No. 8 would not be detectable by Duke's procedures.

Fredrikson and Mogus (8) examined the security return behavior of MNCs to determine if the returns of firms that were required to change their translation methods were statistically different from the returns of firms that were already using a translation method that approximated the SFAS No. 8 method. The authors selected a sample of 400 firms whose translation method prior to the issuance of SFAS No. 8 was known. Those firms were classified into four groups according to translation method and accounting treatment of the exchange adjustment. The control group, against which the other three groups were compared, was the firms using the monetary/nonmonetary method with current recognition of exchange adjustments. The test period studied by the authors was 24-month period, starting November 1975 and ending October 1976.
The authors compared the average residual returns of the three test groups against the control group. They used the F test and Dunnett's t, and found no significant difference between the security returns of the test and control group. They also divided and compared firms by the following factors:

1. Size of foreign revenue (more than 30% vs less than 20%).
2. Firm size (more than $1,000 million vs. $300 million).
3. Number of countries (more than 12 vs less than 5).
4. Industry classification (four groups).

In each case, the authors concluded that there was no significant effect of SFAS No. 8 on security prices.

Makin (15) investigated whether it was possible to contradict the hypothesis that SFAS No. 8 had no new informational content and therefore no impact on the security returns of affected MNCs. Makin used three groups of firms; classified into domestic, MNCs, and MNCs sensitive to SFAS No. 8; and five test periods.

To infer the impact of SFAS No. 8, the author used the effect on market model parameters and found that there was a slight adverse effect on the cost of capital of MNCs sensitive to SFAS No. 8. Jain (12) criticized Makin's study for the inconclusiveness of its results and for some methodological weaknesses. According to Jain, some firms included
in the group of MNCs sensitive to SFAS No. 8 were using the temporal method of SFAS No. 8 prior to its issuance, and, therefore, should have been unaffected by the adoption of SFAS No. 8.

Other research studies examined the effects of the application of different translation methods on reported earnings and earnings variability. Duangploy (3) examined whether the criticism of the effect of the temporal method on earnings per share is justifiable. The author compared the effect of the application of SFAS No. 8 to the results obtained with other formerly accepted or proposed methods of translation. Duangploy adopted a computer-based "what if" model to measure the effect of the different translation methods on earnings per share. He concluded that the temporal method does not always cause greater fluctuation in earnings per share than other translation methods that have been used in practice or proposed by the accounting profession.

Nance (16) investigated the effect of five translation methods on reported earnings and earnings variability. The five methods examined are: (1) the 1980 Exposure Draft method, (2) the current rate method, (3) the current/non-current method, (4) the monetary/nonmonetary method, and (5) a modification of the monetary/nonmonetary method in which inventory is translated at the current exchange rate.
Nance examined the five methods of translation in four different stages. First, a mathematical model of translation was used for the identification and classification of different translation effects. Second, the five translation methods were compared on the theoretical bases of their accord with economic changes in identifiable assets values brought about by changes in the exchange rate and of the comparability of their product with the financial statements of domestic firms. Third, the financial statements of 160 real MNCs were translated into two currencies over a twelve year interval using each of the five methods. Finally, the results of translation, particularly earnings and earnings variability, were examined for each of the five methods.

Nance concluded that the monetary/nonmonetary method with inventory translated at the current rate was the most satisfactory method for translating historical cost based financial statements, and the method of 1980 Exposure Draft was the least satisfactory method. He also concluded that relative earnings variability was greatest under the current/noncurrent method and the current rate method, and least under the method of 1980 Exposure Draft. The author further concluded that earnings per share differed with the translation method used, and the variability of earnings per share was independent of currency, industry group, and industry.
Empirical Studies on the Effects of SFAS No. 52 on the Translation of Foreign-Currency Financial Statements

This section presents the results of some research studies regarding the impact of the change embodied in SFAS No. 52 on the translation of foreign currency financial statements.

Troberg (20) examined whether a difference among the translation methods existed with respect to preserving the reported net income information and the financial relationships embodied in the foreign financial statements of foreign subsidiaries. On the basis of a "reverse" approach and four methods of analysis, Troberg concluded that SFAS No. 8 method of translation was less able than SFAS No. 52 method to reflect the financial results and relationship embodied in the foreign financial statements because of SFAS No. 8's extensive reliance on historical rates and inclusion of translation gains and losses in reported net income.

Troberg tested four translation alternatives. They were: (1) SFAS No. 8 with exchange rates, (2) SFAS No. 8 with PPP ratios, (3) SFAS No. 52 with exchange rates, and (4) SFAS No. 52 with PPP ratios. He utilized the quarterly financial statements for 1976-1981 of four U.S. companies. Under the approach selected in this study, described as a "reverse" approach, the quarterly financial statements were translated into a reporting currency of a country with a
lower inflation rate than the United States (West Germany) as well as to a reporting currency of a country with a higher inflation rate than the United States (Great Britain). The author stated that the advantages of this approach were: (1) the financial statements to be translated had been prepared in accordance with the U.S. generally accepted accounting principles, and therefore no adjustment of the statements to reflect U.S. generally accepted accounting principles was needed, and (2) since the same statements were translated into two economies affected differently by inflation, the effects of differential inflation on the translation results could be determined more precisely (20, pp. 71-72).

The different translation alternatives were evaluated with respect to preserving net income information by establishing the statistical correlation between the translated and nontranslated net income time-series patterns. Troberg used the Pearson-Moment formula test to obtain the correlation coefficient ($r$) by considering the pair of translated-non-translated values corresponding to every quarter. He also performed the Spearman's rank correlation ($R$) test to obtain the correlation coefficient for each case. The ability of the translation alternative to preserve financial relationships was measured by calculating and comparing, by means of correlation analysis, key before-and-after
translation ratios (eight financial ratios and net income). There were seventy-two cases in this study. The values of each case were represented by the correlation coefficients. To test the overall difference between the different translation approaches, the author used the Quade test to determine whether there were differences between the four translation approaches.

The generalizability of Troberg's conclusions and recommendations may be limited because of the very small sample size (four companies which were not randomly selected), and because of the limited range of differently structured firms and environmental conditions of this study.

Taussig (19) evaluated the strength and weaknesses of the current rate method of translation (SFAS No. 52 method) versus the temporal method (SFAS No. 8 method). He simulated operating results for three models to evaluate the two translation methods for three years. The three models used in the study were:

1. Simultaneous inflation and devaluation, with no local debt.
2. Simultaneous inflation and devaluation, with local debt.
3. Nonsimultaneous inflation and devaluation, with local debt.
The author postulated a Hicksian concept of income as the basis for comparing the temporal method against the current rate method for each model.

Taussig concluded that the current rate method promulgated by SFAS No. 52 was preferable in noninflationary environment. However, the temporal method with inclusion of translation adjustments in the income statement was preferable over the current rate method with the company operates in a highly inflationary environment (19, pp. 154-155).

Part of Taussig's conclusion was based on the thesis that MNCs in highly inflationary economies tend to repatriate cash as soon as possible, whereas MNCs in nonhighly inflationary economies reinvest earnings. However, one can argue against this thesis by pointing to the fact that governments of high-inflation countries usually impose foreign exchange restrictions on repatriation of funds. For example, Ernst and Whinney (5) indicated that during the 1978-1980 period, Peru experienced a cumulative inflation rate of 319 percent and cumulative devaluation of its currency against the U.S. dollar of 240 percent. According to Ernst and Whinney (6), the Peruvian government imposed restrictions on repatriation of equity, capital, interest, dividends, branch profits, and royalties during the 1978-1980 period.
Taussig also recommended that segment analysis should be detailed by geographical areas where translation adjustments either have been material or are expected to be material. Also, net foreign assets should be subdivided into their monetary and nonmonetary components to assist users of financial reports in their evaluation of company risks.

Taussig's study confirmed the wisdom of the FASB incorporating the temporal and the current rate methods in SFAS No. 52. However, the study can be criticized on the following grounds:

1. The created financial statements are seldom representative of MNCs' operating results. They are prepared with too much emphasis on facilitating later elaborations of the financial statements, which obscures the realism of these statements.

2. The creation of transactions can create a danger of too much standardization of transactions from period to period in an effort to make the whole task more operational and manageable.

Evans and Folks (7) conducted a questionnaire survey of the MNCs that "early adopted" SFAS No. 52 prior to its effective date. The authors focused on the MNCs' decision to adopt SFAS No. 52 for 1981, the reasons behind this decision, and the impact of SFAS No. 52 on 1981 operating
results. A total of 87 of the 184 respondents to the survey were early adopters of SFAS No. 52.

The respondent MNCs were asked to identify the factors that they considered in their decision to adopt SFAS No. 52 prior to its effective date. The majority of the adopting firms (91.9 percent) indicated that the reason for adopting SFAS No. 52 for 1981 was the impact on reported earnings. The study revealed that this impact was generally a positive one; sixty-three early adopters reported that the use of SFAS No. 52 increased their earnings over the level that they would have reported under SFAS No. 8, whereas only one early adopter reported reduced earnings from the adoption of SFAS No. 52. The average increase in earnings was 13.7 percent. The authors concluded that the early adoption of SFAS No. 52 generally resulted in a significant increase in earnings.

Other important factors favoring early adoption were the anticipated reduction in volatility of future earnings (82.8 percent), the exchange rate movements during 1981 (80.5 percent), and the anticipated impact on future reported earnings (71.3 percent). Technical factors, such as the time period allowed for implementation in 1981 and the necessity of developing new systems for the new standard, were not rated as particularly important. Evans and Folks concluded that early adopters tended to rate future
volatility reduction more important than future earnings levels, and present earnings more important than future earnings.

The study also showed that 28.7 percent of the early adopters used "Cumulative Translation Adjustments" as a title for the new balance sheet translation account. Almost half of the early adopters (47.1 percent) provided their analysis of this account in the notes to financial reports, and 36.8 percent reported it in "Statement of Changes in Stockholders' Equity." Restatement for previous years was done by only 22.3 percent of the early adopters, with an average period of restatement of 3.7 years.

The study also revealed a conservative approach toward hedging of SFAS No. 52 accounting exposure. A majority of the firms (52.9 percent) indicated that they would selectively or regularly hedge this exposure. Only 21.2 percent indicated that they never planned to hedge this exposure, and only 14 percent indicated that the early adoption of SFAS No. 52 had allowed them to close out existing forward hedge contracts earlier than anticipated.

Evans and Folks's overall conclusion was that the main decision factors in those MNCs who early adopted SFAS No. 52 were income statement oriented. These MNCs overcame the implementation problems that stopped other MNCs because of the impact of SFAS No. 52 on their reported earnings for 1981. The conceptual superiority of SFAS No. 52 and its impact on the balance sheet were secondary factors.
CHAPTER BIBLIOGRAPHY


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CHAPTER IV

RESEARCH METHODOLOGY

This chapter is composed of five sections. The sections cover the (a) research hypotheses, (b) research design, (c) data gathering and variable measurements, (d) sample selection, and (e) research models and methods used to analyze and test the hypotheses for this study.

Research Hypotheses

The empirical hypotheses derived from the statement and discussion of the problem found in Chapter II, formulated in the null form, are designed to test the effects of SFAS No. 52 on security returns, volume, and reported earnings of the affected MNCs.

Two hypotheses emerge for testing the capital market reaction to SFAS No. 52: one for security returns and the other for security volume. This first set of hypotheses is stated as follows.

\[
H_0_r: \text{There will be no significant difference between the impact of SFAS No. 52 and the impact of SFAS No. 8 on the security return distributions of MNCs.}
\]

\[
H_0_v: \text{There will be no significant difference between the impact of SFAS No. 52 and the impact of SFAS}
\]
92

The results of the empirical tests of this first set of hypotheses will indicate whether capital market agents will or will not be able to ferret out the new information contained in SFAS No. 52. The lack of observed abnormal security returns subsequent to the issuance of SFAS No. 52 would tend to support the hypothesis that SFAS No. 52 had no effect, whereas the existence of such observation would support the contention that it did.

Acceptance of $H_0$ would not be sufficient to make inferences about the information content of SFAS No. 52. Capital market agents in the aggregate may not produce a discernible effect on equilibrium prices in the security market. Yet individually, each market agent may alter his portfolio holdings of any particular security. The acceptance of $H_0$ would indicate that SFAS No. 52 had no effect on the risk-return preference of individual agents in the security market, whereas the rejection of $H_0$ would indicate that SFAS No. 52 had such effect.

To test whether the capital market reacts differently to those MNCs who early adopted SFAS No. 52 as opposed to late adopters, two hypotheses emerge, one for security returns and the other for security volume. This second set of hypotheses is stated as follows.
There will be no significant difference in the security return distributions between early adopters and late adopters of SFAS No. 52.

There will be no significant difference in the security volume distributions between early adopters and late adopters of SFAS No. 52.

The results of the empirical tests of this second set will indicate whether the capital market will or will not react differently to the early adoption of SFAS No. 52. If there is some disturbance of information in the security market because of the actual implementation of the policy changes of SFAS No. 52, then one would expect a difference between the market reaction to early adopters as opposed to late adopters of SFAS No. 52.

The third set of hypotheses is designed to test the effects of SFAS No. 52 on the volatility of reported earnings of MNCs. This third set of hypotheses is stated as follows.

There will be no change in the volatility of reported earnings of MNCs resulting from the change in the accounting treatment of unrealized translation adjustments embodied in SFAS No. 52.

The volatility of reported earnings of MNCs under either SFAS No. 52 or SFAS No. 8 will not be affected by the (a) size of foreign operations measured by foreign revenue as a percentage of total
revenue, (b) size of foreign assets measured as a percentage of total assets, and (c) major industrial classification.

The results of the empirical tests of this third set of hypotheses will indicate whether the differentiation of the translation procedures promulgated by SFAS No. 52 overcome the major criticism of SFAS No. 8, namely, volatile reported earnings of MNCs.

Research Design

To test the security return and volume responses in the capital market to the information content of SFAS No. 52, a control group of domestic firms which are not subject to the requirements of SFAS No. 52 is introduced to the research design.

Figure 3 presents the general design which includes four primary cells: T1, T2, C1, and C2. The horizontal division allows a separation of the data into a test group composed of MNCs and a control group composed of domestic firms. The vertical division then permits a separation of the data from both groups into pre-SFAS No. 52 and post-SFAS No. 52 categories. The primary cell T2 is sub-divided into cells T21 and T22. Cell T21 represents MNCs who early adopted SFAS No. 52 prior to the effective date of mandatory adoption, and cell T22 represents late adopters of SFAS No.
FIGURE 3
Research Design

Pre-SFAS No. 52     Post-SFAS No. 52

Test Group

<table>
<thead>
<tr>
<th>T₁ [MNCs]</th>
<th>T₂ [MNCs]</th>
</tr>
</thead>
</table>

Control Group

<table>
<thead>
<tr>
<th>C₁ [DOMESTIC]</th>
<th>C₂ [DOMESTIC]</th>
</tr>
</thead>
</table>

T₂₁ [MNCs]
[EARLY ADOPTERS]

T₂₂ [MNCs]
[LATE ADOPTERS]
52. This division is feasible since the FASB encouraged MNCs to adopt SFAS No. 52 prior to its effective date and many MNCs switched accounting methods in 1981 and 1982. The general research design can be seen as a repeated measures design on two samples after incorporating a treatment, SFAS No. 52, on the test group.

The vertical division, the intervention date, is a crucial aspect of the accounting policy change issue. SFAS No. 52 was issued in December 1981 and became effective in December 1982. The issuance date has been chosen as the intervention date because it signifies the FASB's final decision on the issue of foreign currency translation and exchange adjustments. Because of the uncertainty created by the revision of the initial Exposure Draft of 1980 and the considerable objection to the second Exposure Draft of 1981, the issuance date of either Exposure Draft cannot be selected as an appropriate intervention date. The effective date of SFAS No. 52 cannot be selected as an appropriate intervention date because many MNCs adopted SFAS No. 52 for their 1981 and 1982 operating results.

The pre-intervention period originates on December 31, 1979 and extends to December 31, 1981, while the post-intervention period runs from January 1, 1982 through December 31, 1984. The reason for selecting December 31, 1979 as the origin for this study is that the U.S. dollar fell sharply
throughout 1978, particularly against the German mark, the Swiss franc, and the Japanese yen. The behavior of exchange rates, therefore, was erratic during 1978. On November 1, 1978, the United States announced measures to defend the dollar. The package included increased swap lines, drawings from the International Monetary Fund, and sales of gold and bond issues in the Euro-markets (13, p. 101). The U.S. dollar recovered and foreign exchange rates stabilized, as a result of such measures, by the end of the first quarter of 1979. Truncating the study at December 31, 1984 is conditioned by the data availability.

To measure the effects of SFAS No. 52 on security returns and volume, a cross-sectional comparison of the pre-SFAS No. 52 relationship between cells $T_1$ and $C_1$ with the post-SFAS No. 52 relationship between cells $T_2$ and $C_2$, and an over time comparison between cells $T_1$ and $T_2$ are used.

To measure the effects of the early adoption of SFAS No. 52 prior to its effective date, a cross-sectional comparison of the pre-SFAS No. 52 relationship between cells $T_{21}$ and $T_{22}$ with the post-SFAS No. 52 relationship between cells $T_{21}$ and $T_{22}$, and an over time comparison between pre-SFAS No. 52 and post-SFAS No. 52 for cells $T_{21}$ and $T_{22}$ are used.

The general research design is also used to test the effects of SFAS No. 52 on the volatility of reported
earnings of MNCs. The volatility of reported earnings, the effects of foreign operations and foreign assets on the volatility of reported earnings, and the effects of the major industrial classification on the volatility of reported earnings of MNCs are examined by an over time comparison between cells T₁ and T₂.

Data Gathering and Variable Measurements

Different types of data were gathered in order to proceed with measuring the variables involved in this study. These data include (a) security returns data, (b) security volume data, (c) exchange adjustments and foreign operating and financial data, and (d) quarterly earnings figures.

Security Returns

The monthly security returns of the sample firms and the market returns, covering a period of 108 months (January, 1976 to December, 1984), were retrieved from the University of Chicago's Center for Research in Security Prices (CRSP) monthly returns tape (6).

Monthly Security Return.--A monthly security return is a measure of the change in the total value of an investment in a common stock over some period such as a month per dollar of initial investment. Redefined in terms of the natural logarithm, the return on security j in month t (R_{jt}, hereafter) can be interpreted as the rate of return of the
security assuming continuous compounding. $R_{jt}$ is measured as follows.

$R_{jt} = \ln(P_{jt} + D_{jt}) / (P_{jt} - 1)$

where

$P_{jt} = \text{closing price for security } j \text{ at the end of month } t;$

$D_{jt} = \text{cash dividend paid on one share of firm } j \text{ in month } t;$ and

$P_{jt-1} = \text{closing price for security } j \text{ for month } t - 1.$

Return on Market Index.--The rate of return on market index ($R_{mt}$, hereafter) in this study is the Standard and Poor's 500 Composite Index obtained from the CRSP file. $R_{mt}$ is measured in terms of the natural logarithm as follows.

$R_{mt} = \ln(S_{Pt} / S_{Pt-1})$

where

$S_{Pt} = \text{closing value of Standard and Poor's Price Index at the end of month } t,$ and

$S_{Pt-1} = \text{closing value of Standard and Poor's Price Index at the end of month } t-1.$

Security Volume

The volume data for the sample firms were obtained from Standard and Poor's Daily Stock Price Record (7) for the regression period of 52 weeks (January 1, 1980 to December 26, 1980) and for the test period of 19 weeks (October 5, 1981.
to February 12, 1982). The volume data for all the market firms were obtained from Standard and Poor's Statistical Service, Basic Statistics, Banking and Finance (3). The two volume figures measured are the weekly average of shares traded and the level of volume for all the market firms.

**The Weekly Average of Shares Traded.**—The weekly average of the daily percentage of shares traded for each firm in the test and control group ($V_{jt}$, hereafter) is measured as follows.

$$V_{jt} = \left( \frac{S_{jt}}{G_{jt}} \right) \left( \frac{1}{T_t} \right)$$

where

$S_{jt} =$ the number of shares of firm $j$ traded in week $t$,

$G_{jt} =$ the number of shares outstanding for firm $j$ in week $t$, and

$T_t =$ the number of trading days in week $t$.

$V_{jt}$ was computed by dividing weekly volume by the number of shares outstanding so that the results would not be biased because of the greater weight assigned to firms with the larger number of shares outstanding. The percentage of shares traded per week was then divided by the number of trading days in each week $t$ to adjust for unequal number of trading days in all weeks.

**The Level of Volume for Market Firms.**—The level of volume for all NYSE firms ($V_{mt}$, hereafter) was computed as follows.
\[ V_{mt} = \left( \frac{S_{mt}}{G_{mt}} \right) \left( \frac{1}{T_t} \right) \]

where

- \( S_{mt} \) = the number of shares traded for all NYSE firms in week \( t \),
- \( G_{mt} \) = the number of shares outstanding for all NYSE firms in week \( t \), and
- \( T_t \) = the number of trading days in week \( t \).

The weighting scheme implicit in \( V_{mt} \) assigns greater weight to firms with the larger number of shares outstanding. However, Beaver (1) indicated that the use of this index does not lead to either an upward or a downward bias in the findings (1, p. 73).

**Foreign Operating and Financial Data**

The annual financial statements and the SEC Form 10-K of the firms in the test group (MNCs) were used to obtain the following key data items: (a) foreign currency exchange gains and losses, (b) foreign sales and foreign assets, (c) total revenue and total assets, and (d) operating income. These key data items were obtained for the period of 1979 to 1984, and were used to compute the impact of foreign exchange on reported earnings, the size of foreign sales, and the size of foreign assets. The reason for using the annual reports and Form 10-K reports to obtain these key data items instead of the COMPSTAT tapes is that there were several
problems in using the COMPUSTAT tapes. Examples of these problems are (a) foreign sales and foreign assets data are not readily available, (b) data structure is not appropriate to compute foreign exchange gains and losses, and (c) data are missing for some items in some years.

Impact of Foreign Exchange on Earnings.—The impact of foreign exchange on MNCs' reported earnings ($VRE_{jt}$, hereafter) was computed for each firm in the test group as follows.

$$VRE_{jt} = \frac{FCA_{jt}}{OI_{jt}}$$

where

- $VRE_{jt} =$ the measure of the impact of foreign exchange on earnings of firm $j$ in period $t$,
- $FCA_{jt} =$ the foreign currency gains and losses for firm $j$ in period $t$, and
- $OI_{jt} =$ operating income of firm $j$ for period $t$.

In order to prevent the negative sign of an operating loss from confounding with a foreign exchange loss, the absolute value of operating income was used as the denominator in computing $VRE_{jt}$. Furthermore, operating income in this study is defined and measured as net sales (or net revenue) less cost of goods and operating expenses before deducting depreciation, amortization, and depletion.

Average Impact on Earnings.—The average impact of foreign exchange on earnings ($VRE_t$, hereafter) was computed for each MNC in the test group as follows.
\[
\bar{\text{VRE}}_t = \frac{1}{N} \sum_{j=1}^{N} \text{VRE}_{jt}
\]

where

\[ t = 1, 2, \ldots, T, \text{ the test period.} \]

\( \bar{\text{VRE}}_t \) was computed across the two years prior to the adoption of SFAS No. 52, and also across the two years following the adoption of SFAS No. 52. For example, \( \bar{\text{VRE}}_t \) was computed for the MNCs who early adopted SFAS No. 52 for the period of 1979 to 1980 and for the period of 1981 to 1982. \( \bar{\text{VRE}}_t \) was also computed for the MNCs who adopted the Statement in 1982 for the period of 1980 to 1981 and for the period of 1982 to 1983.

**Size of Foreign Sales.**—The size of foreign sales or foreign revenue (\( \text{SFS}_{jt} \), hereafter) was measured as follows.

\[ \text{SFS}_{jt} = \frac{\text{FS}_{jt}}{\text{TS}_{jt}} \]

where

\( \text{SFS}_{jt} \) = the size of foreign sales or foreign revenue of firm \( j \) in period \( t \),

\( \text{FS}_{jt} \) = the foreign sales or revenue of firm \( j \) in period \( t \), and

\( \text{TS}_{jt} \) = the total sales or total revenue of firm \( j \) in period \( t \).

**Size of Foreign Assets.**—The size of foreign assets (\( \text{SFA}_{jt} \), hereafter) was measured for each firm in the test group as follows.
$SFA_{jt} = (FA_{jt} / TA_{jt})$

where

$SFA_{jt} = \text{the size of foreign assets for firm j in period } t,$

$FA_{jt} = \text{the foreign assets of firm j in period } t,$ and

$TA_{jt} = \text{the total assets of firm j in period } t.$

**Quarterly Earnings Figures**

The quarterly reported earnings of the firms in the test group (MNCs) were obtained from Quarterly Industrial COMPUSTAT tape (4) for the period of January 1976 to December 1984. The quarterly reported earnings were used to compute the coefficient of variation (COV, hereafter). The COV was used to measure the volatility of reported earnings of MNCs, among other measures, in the pre-SFAS No. 52 and post-SFAS No. 52 periods.

**Sample Selection**

This section covers the definition of the firms that represent the population or the frame of this study, and the sample selection procedures used in the identification of the sample firms.

**Definition of Firms**

In the initial phase of sample selection, the following definitions were used to identify the firms that represent the different populations of this study.
Multinational Corporation.--A firm is defined as a MNC if: (1) its financial statements reflect the financial statements of one or more foreign operations by combination, consolidation, or equity accounting; or (2) it has significant financial transactions calling for settlement in currencies other than the U.S. dollars.

Domestic Firm.--For purposes of this study, any firm that has neither significant export transactions nor any other significant transactions requiring settlements in foreign currencies.

Early Adopters.--For purposes of this study, early adopters are MNCs that adopted SFAS No. 52 prior to its effective date for their 1981 operations.

Late Adopters.--For purposes of this study, late adopters are MNCs that adopted SFAS No. 52 after 1981. As a matter of judgment on the part of the researcher, late adopters were the MNCs that adopted the Statement for their 1982 or 1983 operations.

Firms were initially identified as MNCs from Dun and Bradstreet Who Owns Whom (17), which provides an exhaustive listing of all firms who have foreign subsidiaries operating outside the United States. Then each firm was confirmed as being a MNC by reference to Multinational Marketing and Employment Directory (12), The World Dictionary of Multinational Enterprises (18), Standard and Poor's Corporation
Records (5), and audited annual financial reports and SEC Form 10-K reports. MNCs were confirmed as being early or late adopters of SFAS No. 52 by specific reference to the audited notes to their annual financial reports indicating the precise date for adopting SFAS No. 52. Firms were confirmed as being domestic firms through a direct examination of the audited financial reports.

Sample Selection Procedures

The inclusion of firms in the test sample (MNCs) and in the control sample (domestic) had to satisfy the following selection criteria.

1. The firm must be listed on the New York Stock Exchange (NYSE).
2. Data for the firm must be continuously available on the CRSP tape from January, 1976 through December, 1984.
3. The fiscal year must end on December 31.
4. Quarterly earnings data must be available on the quarterly COMPUSTAT tape.
5. The firm must be a member of an industry with at least twenty firm members based on the Standard Industry Classification (SIC) two-digit code.

Criteria (1) and (2) were selected because of the ease and availability of security return data of NYSE firms.
contained on the CRSP tapes. Criterion (3) was included to ensure that the different analyses are made on a similar basis, and to avoid potential problems resulting from earnings covering different time periods. Criterion (4) was selected because of the availability of quarterly earnings data on the COMPUSTAT tape for NYSE firms. Criterion (5) was imposed to facilitate the matching of firms in the test group to firms in the control group.

The test group of MNCs was selected in seven steps as shown in Table IV. The initial search process identified 1,390 firms as MNCs. A total of 804 firms were eliminated from the test sample by restricting the sample to NYSE firms listed in Standard and Poor's Security Owner's Stock Guide (14). An additional 182 firms were removed from the sample because they did not have a December 31 fiscal year end. Thirty-six firms were eliminated because their annual reports for particular years were unavailable. Fifty-two firms were excluded from the test sample because the magnitude of the foreign exchange adjustment was mentioned to be "immaterial" or not mentioned at all. A total of 22 firms were eliminated because they did not disclose their foreign revenues and foreign assets in any year of the test periods. Eleven firms were removed from the test sample since they did not disclose the precise date of adopting SFAS No. 52. Finally, 9 firms were eliminated from the test sample.
because they did not have enough security return data on the CRSP tape. A list of the 274 MNCs included in the test sample is provided in Appendix A.

### TABLE IV

**MNCs INCLUDED IN THE TEST SAMPLE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms that were initially identified as MNCs</td>
<td>1,390</td>
</tr>
<tr>
<td>Less: MNCs that were not NYSE firms</td>
<td>(804)</td>
</tr>
<tr>
<td>Less: MNCs that did not have a December 31 fiscal year end</td>
<td>(182)</td>
</tr>
<tr>
<td>Less: MNCs for which annual reports or SEC Form 10-K reports were not available</td>
<td>(36)</td>
</tr>
<tr>
<td>Less: MNCs that did not have adequate foreign exchange adjustment data</td>
<td>(52)</td>
</tr>
<tr>
<td>Less: MNCs that did not disclose foreign revenues and foreign assets in any of the years of the test periods</td>
<td>(22)</td>
</tr>
<tr>
<td>Less: MNCs for which the precise date of adopting SFAS No. 52 was unknown</td>
<td>(11)</td>
</tr>
<tr>
<td>Less: MNCs that did not have adequate returns data on the CRSP tape</td>
<td>(9)</td>
</tr>
<tr>
<td>Total Number of MNCs Included in The Test Sample</td>
<td>274</td>
</tr>
</tbody>
</table>

The next stage of identification traced all 274 MNCs to their respective annual financial reports and Form 10-K reports for the years 1979-1984 inclusive. The objective
was the verification of the precise date for adopting SFAS No. 52. This procedure yielded 126 MNCs that had early adopted SFAS No. 52 for their 1981 financial statements and 148 MNCs that had adopted SFAS No. 52 after 1981.

Forty-seven of the 274 MNCs included in the test sample did not have enough security volume data in any of the test periods. These 47 MNCs were excluded from the statistical analysis for security volume. In other words, 227 MNCs were used to test the effect of SFAS No. 52 on security volume (114 early adopters and 113 late adopters).

The control group of domestic firms were selected from a pool of all the firms on the CRSP tape that met the selection criteria, and were not included in the pool of test firms. From this control pool, 204 firms were selected to match the industry classification and size of MNCs included in the test sample. The audited notes to the financial statements of these 204 firms were consulted and carefully examined to ensure that each firm did not have any significant export transactions or any other significant transactions requiring settlements in foreign currencies. An attempt was made to pairwise match the selected domestic firms to the 274 MNCs included in the test sample on the basis of the two-digit SIC industry code. However, the matching was not satisfactory due to the limited number of domestic firms in the control pool that met the selection criteria.
Furthermore, the matching on the basis of size (sales and assets) was not successful. The sample selection procedures resulted in selecting domestic firms that were smaller in size than the 274 MNCs included in the test sample.

Table V shows the industry distribution of the 274 MNCs included in the test group. These MNCs are concentrated in classification 28 (Chemicals and Allied Products), classification 35 (Engines, Machinery, Turbines), and in classification 36 (Electrical Machinery). The early adopters and late adopters are distributed fairly evenly among the SIC classifications except in two instances involving classification 29 (Petroleum Refining) and classification 30 (Rubber Products). The petroleum refining SIC classification has 12 late adopters and no matching early adopters. The rubber products SIC classification has 7 early adopters and no matching late adopters.

Table VI shows the industry distribution of two-digit SIC classifications of the 204 domestic firms included in the control sample. The firms are well diversified over industries, and concentrated in classification 36 (Electrical Machinery), classification 35 (Engines, Machinery, Turbines), and classification 33 (Primary Metals). The differences in industry classification between the control group and the test group reflect the severe data constraints that
were associated with the attempt to match a control group of domestic firms with a test group of MNCs.

Table VII shows the frequency distribution of the magnitude of foreign sales (revenues) and foreign assets, and the profile of the test sample firms. The figure for foreign sales is defined as an average of net sales (revenue) from 1979 to 1983. The total of foreign assets is also defined as an average of foreign identifiable assets for 1979 to 1983. The test sample firms do have a high concentration in size category "1000 and above" and in size category "less than 100".

Table VIII shows the frequency distribution of foreign exchange adjustments as a percentage of operating income for the years 1979-1983. The number of MNCs reporting negative foreign exchange adjustments increased every year, with a substantial increase in 1981. The percentage of the MNCs with negative exchange adjustments of 0.1% or greater are 61%, 59%, 73%, 88%, and 89% for the years 1979-1983, respectively. The two possible explanations for such increases are: (1) foreign exchange rates could have sharply fluctuated during that period, and (2) the adoption of the current rate method of translation required by SFAS No. 52 in the years 1981-1983.

Table IX shows comparative statistics about the sales and total assets of the test and control firms. The matching on sales and total assets is obviously poor. Each of
TABLE V

FREQUENCY DISTRIBUTION OF TEST SAMPLE FIRMS BY INDUSTRY

<table>
<thead>
<tr>
<th>Two Digit SIC Code</th>
<th>Test Firms</th>
<th>EA&lt;sup&gt;c&lt;/sup&gt;</th>
<th>LA&lt;sup&gt;d&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
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<td>F&lt;sup&gt;a&lt;/sup&gt;</td>
<td>FF&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>1</td>
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<td>.0108</td>
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</tr>
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<td>21</td>
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<td>.0073</td>
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<td>.0037</td>
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<td>12</td>
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<td>.0255</td>
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<td>73</td>
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<td>.0292</td>
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<tr>
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</table>

Total: 274

<sup>a</sup>F = Frequency  <sup>b</sup>PF = Percentage Frequency  <sup>c</sup>EA = Early Adopters  <sup>d</sup>LA = Late Adopters
TABLE VI

FREQUENCY DISTRIBUTION OF CONTROL SAMPLE FIRMS
BY INDUSTRY

<table>
<thead>
<tr>
<th>Two Digit SIC Code</th>
<th>Number of Control Firms</th>
<th>Percentage Frequency</th>
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### TABLE VII

FREQUENCY DISTRIBUTION OF TEST SAMPLE FIRMS
BY SIZE OF FOREIGN SALES AND FOREIGN ASSETS

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<th></th>
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<tbody>
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<td>FS(^a)</td>
<td>FA(^b)</td>
<td>FS</td>
<td>FA</td>
<td>FS</td>
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<td>900-999</td>
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<td>4</td>
<td>7</td>
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<tr>
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<td>13</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
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<td>6</td>
<td>6</td>
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</tr>
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<td>14</td>
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<td>13</td>
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<tr>
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<td>17</td>
<td>20</td>
<td>14</td>
<td>19</td>
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<tr>
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<td>24</td>
<td>19</td>
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<td>29</td>
<td>36</td>
<td>37</td>
<td>33</td>
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<tr>
<td>Less than 100</td>
<td>86</td>
<td>97</td>
<td>76</td>
<td>91</td>
<td>75</td>
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</table>

**Firm Profile Analysis**

<table>
<thead>
<tr>
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<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
<td>FS(^a)</td>
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<td>FA(^b)</td>
<td>12.1</td>
<td>47,070.8</td>
<td>2,331.5</td>
<td>6,758.1</td>
</tr>
</tbody>
</table>

\(^a\) FS = Foreign sales (revenues) in millions calculated over the period 1979 through 1983

\(^b\) FA = Foreign assets in millions calculated over the period 1979 through 1983
### TABLE VIII
FREQUENCY DISTRIBUTION OF FOREIGN EXCHANGE ADJUSTMENTS

<table>
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<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(^aF)</td>
<td>(^bPF)</td>
<td>(^aF)</td>
<td>(^bPF)</td>
<td>(^aF)</td>
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<tr>
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<td>3 .0109</td>
<td>20 .0730</td>
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<td>31 .1131</td>
</tr>
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<td>7 .0255</td>
<td>1 .0036</td>
<td>25 .0912</td>
<td>40 .1460</td>
<td>33 .1204</td>
</tr>
<tr>
<td>-5 to -9.9</td>
<td>9 .0328</td>
<td>8 .0292</td>
<td>36 .1314</td>
<td>44 .1606</td>
<td>75 .2737</td>
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<td>-1 to -4.9</td>
<td>145 .5292</td>
<td>148 .5401</td>
<td>103 .3759</td>
<td>89 .3248</td>
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<td>0.1 to 4.9</td>
<td>95 .3467</td>
<td>97 .3540</td>
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</tr>
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<td>9 .0328</td>
<td>5 .0182</td>
<td>3 .0109</td>
<td>2 .0073</td>
</tr>
<tr>
<td>10 to 14.9</td>
<td>3 .0109</td>
<td>4 .0146</td>
<td>5 .0182</td>
<td>2 .0073</td>
<td>3 .0109</td>
</tr>
<tr>
<td>15 to 19.9</td>
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<td>1 .0036</td>
<td>1 .0036</td>
<td>1 .0036</td>
<td>1 .0036</td>
</tr>
<tr>
<td>20 and above</td>
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<td>1 .0036</td>
<td>3 .0109</td>
<td>2 .0073</td>
<td>2 .0073</td>
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<td><strong>Total</strong></td>
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<td>274</td>
<td>274</td>
<td>274</td>
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</table>

\(^aF\) = Frequency  
\(^bPF\) = Percentage Frequency
the categories of the mean, minimum and maximum sales and total assets for the test firms are much larger compared to respective categories of the control firms. The mean sales of the test group is more than double the mean sales of the control group. The mean assets of the test group is more than triple the mean assets of the control group. Furthermore, the MNC with the largest amount of sales is almost four times as large as the sales amount of the largest control domestic firm. Also, the MNC with the largest amount of total assets is more than double the amount of total assets of the largest control domestic firm.

**TABLE IX**

**COMPARATIVE STATISTICS ON SALES AND TOTAL ASSETS OF TEST AND CONTROL FIRMS**

<table>
<thead>
<tr>
<th></th>
<th>Test Firms</th>
<th>Control Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales(^a)</td>
<td>Assets(^b)</td>
</tr>
<tr>
<td>Mean</td>
<td>4915.9</td>
<td>5944.8</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>12652.8</td>
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<td>Minimum Value</td>
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<tr>
<td>Maximum Value</td>
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<td>76821.1</td>
</tr>
</tbody>
</table>

\(^a\)Sales (revenues) in millions calculated over the period 1979 through 1983  
\(^b\)Assets in millions calculated over the period 1979 through 1983.
Research Models

This section presents the different research models that were used in this study to examine the effects of SFAS No. 52 on security returns, volume, and reported earnings of the affected MNCs.

**Measuring the Effects on Security Returns**

In measuring the effects of accounting changes on security returns behavior, the assumption made is that the assessment of the probability distribution of returns is the object of interest to market agents. The semi-strong form of the informational efficiency of the capital market is an accepted hypothesis. This form states that security prices fully reflect all publicly available information.

Given a capital market in equilibrium, a new disclosure is defined to have information content if the distribution of security returns is affected. One approach to estimate the effect of new information is provided by the Sharp-Lintner two-parameter capital asset pricing model, which relates expected returns and relative risks in equilibrium as follows:

\[
E(R_{it}) = R_{ft} + (E(R_m) - R_{ft}) B_{it}
\]

where

- \( R_{it} \) = rate of return on security \( i \) for the period \( t \);
- \( R_{mt} \) = rate of return on the market portfolio;
\( R_{ft} \) = risk-free rate of return;
\( B_{it} \) = \( \frac{\text{Cov}(R_{it}, R_{mt})}{\text{Var}(R_{mt})} \) = relative risk; and
\( E \) = the expectation operator.

The capital asset pricing model states that the equilibrium expected return on an asset is a linear function of its relative risk, \( B_i \), and that two assets with the same \( B_i \) must have the same expected return.

The capital asset pricing model is formulated in an ex-post form and in terms of the variance of the return distributions. It would be extremely difficult therefore to measure the stochastic portion of individualistic component of the error term. Therefore, the model used in this study to test the effects of SFAS No. 52 on security returns is the well-known market model.

The market model was first suggested by Markowitz (10) and later extended by Sharp (15), Lintner (9), Mossin (11), Fama (8), and Beaver (2). It defines the stochastic process that generates and describes security price change (returns) as follows:

\[
R_{jt} = \alpha_j + B_j R_{mt} + U_{jt}
\]

where
\[
E(U_{jt}) = 0;
\]
\[
\sigma(R_{mt}, U_{jt}) = 0;
\]
\[
\sigma(U_{jt}, U_{it}) = 0;
\]
\( R_{jt} \) = the return on security \( j \) in period \( t \);
$$R_{mt} = \text{the return on market index in period } t;$$

$$U_{jt} = \text{stochastic portion of the individualistic component of } R_{jt};$$

$$\alpha_j = \text{intercept of the linear relationship between } R_{jt} \text{ and } R_{mt};$$

and

$$B_j = \text{slope coefficient of the linear relationship between } R_{jt} \text{ and } R_{mt}.$$ 

The market model asserts that there is a linear relationship between the return on security $j$ and the value of the market factor. It also states that the expected return on security $j$, conditional upon ex-post value of the market factor, is a linear function of the market factor. The difference between ex-post return on security $j$ and the expectation of that return conditional upon the ex-post value of the market factor represents the unexpected portion of return on security $j$ at time $t$ and referred to by $U_{jt}$.

Estimates of the market model parameters $\alpha_j$ and $B_j$, denoted as $\hat{\alpha}_j$ and $\hat{B}_j$, are calculated over a 48-month period prior to the test periods that were used to calculate the abnormal return. Given these estimated parameters of the market model, the expected return, $E(R_{jt})$, is given as:

$$E(R_j) = \hat{\alpha}_j + \hat{B}_j R_{mt}$$

The abnormal return for firm $j$ in month $t$ is defined as the difference between the observed return, $R_{jt}$, and the expected return, $E(R_{jt})$, and is denoted as $E_{jt}$, where
\[ E_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt}) \]

\( E_{jt} \) measures the market reaction to the new information. If the market is efficient, \( E(E_{jt}) = 0 \), significant deviation from zero will be attributed to changes in translation method (new disclosure). \( R_{mt} \) measures new information that affects returns on all securities, whereas the abnormal return, \( E_{jt} \), reflects information that is more specifically relevant to individual securities. The desirability of assessing the unique information effects of a particular firm is stated by Beaver (2) as

...being able to isolate the individualistic component of security returns increases the probability that the information effects can be detected. Otherwise, the "noise" created by market movements might completely obscure the effects of the information item under study (2, p. 411).

To test the first null hypothesis of the first and the second set of hypotheses, the \( E_{jt} \) values were accumulated across firms in the test and control group to provide the average residuals. For portfolio of \( N \) securities, the average residuals is calculated by:

\[ \bar{U}_t = \frac{1}{N} \sum_{j=1}^{N} E_{jt} \]

where

\( E_{jt} = \) the abnormal return of firm \( j \) in month \( t \);
\( \bar{U}_t = \) the average residuals in month \( t \); and
\( N = \) the number of firms in the test group, or in the
control group;

\[ t = 1, 2, \ldots, T, \text{ the test period.} \]

Subject to the assumptions of the market model, the \( \bar{U}_t \) metric is free of market influences and is used for comparison of the test firms and the control firms to examine the effect of SFAS No. 52 on security return behavior using \( t \) tests of significance.

**Measuring the Effects on Security Volume**

Analogous to the market model used to examine the effect of SFAS No. 52 on security return behavior, is the following model for security volume analysis:

\[ V_{jt} = v_j + \phi_j V_{mt} + e_{jt} \]

where

\[ E(e_{jt}) = 0; \]
\[ \sigma(V_{mt}, e_{jt}) = 0; \]
\[ \sigma(e_{jt}, e_{it}) = 0; \]

\( V_{jt} = \) proportion of firm \( j \) shares traded in week \( t \) relative to total firm \( j \) shares outstanding in week \( t \);

\( V_{mt} = \) proportion of total market shares traded in week \( t \) relative to all market shares outstanding in week \( t \);

\( v_j = \) intercept of the linear relationship between \( V_{jt} \) and \( V_{mt} \);
$\phi_j = \text{slope coefficient of the linear relationship between } V_{jt} \text{ and } V_{mt}; \text{ and}$

$e_{jt} = \text{the residual, or that component of an individual security's volume that is unexplained by the marketwide factors contained in } V_{mt}.$

The two reasons for using this particular model to test the effects of SFAS No. 52 on security volume behavior are stated by Beaver (1) as:

(1) It is a simple relationship, and there is no obvious reason why a more complex model would be more appropriate. (2) It is analogous to the model that will be used to remove effects of market-wide events upon the price change of individual securities (1, p. 75).

The weekly average of the daily percentage of shares traded, $V_{jt}$, and the level of volume for all NYSE firms, $V_{mt}$, were defined earlier. The residual term, $e_{jt}$, is that component of an individual security's volume that is unexplained by the marketwide factors as reflected in $V_{mt}$. The steps followed to derive $e_{jt}$ are:

(1) Estimates of the volume model parameters, denoted as $\hat{\phi}_j$ and $\hat{\sigma}_j$, were calculated from a time series, ordinary least squares regression based upon observations from a 52-week estimation period (January 1, 1980 to December 26, 1980).

(2) Given the estimated parameters of the volume model, the expected volume for firm $j$ in each week $t$ of the 19-week
test period (October 5, 1981 to February 12, 1982) was calculated by:

\[ E(V_{jt}) = \hat{V}_j + \hat{\sigma}_j V_{mt} \]

(3) The value of the residual \( e_{jt} \) was computed for each week \( t \) of the 19-week test period for each firm \( j \) in the following manner:

\[ e_{jt} = V_{jt} - E(V_{jt}) \]

To test the second null hypothesis of the first and the second set of hypotheses, two volume analyses were performed. The first analysis was adjusted to remove the effects of the marketwide factors upon the individual security's volume. The second analysis was unadjusted for the capital market influences.

Volume Analysis--Adjusted for Market Influences.--The values of \( e_{jt} \) values were accumulated across firms in the test and control groups to provide the average residuals. For a portfolio of \( N \) securities, the average residuals, \( \bar{e}_{jt} \), is calculated by:

\[ \bar{e}_t = \frac{1}{N} \sum_{j=1}^{N} e_{jt} \]

where

\[ N = \text{the number of firms in the test group, or in the control group; and} \]
\[ t = 1, \ldots, 19 \]
The cumulative average residuals for the test firms and the control firms were compared using the t tests of significance for the different test periods.

Furthermore, some descriptive statistics of the test and control firms were calculated using the mean of \( e_{jt} \) (average across firms for a given week \( t \)), denoted as \( \bar{e}_j \). The \( \bar{e}_j \) was computed by:

\[
\bar{e}_j = \frac{1}{N} \sum_{j=1}^{N} e_{jt}
\]

where

\( N = \) the number of firms in the test or control groups;

and

\( t = -9, \ldots, +9 \)

The value of \( \bar{e}_j \) was also computed for each of the 52 weeks of the estimation period, and then averaged across the 52-week period.

Volume Analysis—Unadjusted for Market Influences.— This volume analysis was limited to the test group firms. In this analysis, no attempt was made to reduce "noise" in the volume data. Beaver (1) defined noise as "any movements in volume due to unspecified factors, one of which is market-wide events that would cause increases in the volume" (1, p. 75).

\( V_{jt} \) was computed for each week \( t \) in the test period for each of the 227 MNCs \( j \). The test period is defined as the
19-week period surrounding the issuance date of SFAS No. 52 (9 weeks before the issuance week, and 9 weeks after). The values of $V_{jt}$ were averaged across MNCs for each of the 19 weeks to provide the mean volume, denoted as $\bar{V}_t$, which was calculated in the following manner:

$$\bar{V}_t = \frac{1}{227} \sum_{j=1}^{N} V_{jt}$$

where

t = -9, ..., +9; and

227 = the number of MNCs in the test group.

The $V_{jt}$ values were also averaged across MNCs for each of the 52 weeks of the estimation period and then averaged across the 52 weeks. Descriptive statistics and graphic presentations were used to examine the effects of SFAS No. 52 on the security volume behavior during the different weeks of the test period.

Measuring the Effects on Volatility of Earnings

To test the first null hypothesis of the third set of hypotheses, three nonparametric tests were used to examine the effects of SFAS No. 52 on the volatility of earnings. These tests are (2) the Wilcoxon matched-pairs signed-ranks test; (b) the Mann-Whitney two-sample test; and (c) the Kolmogorov-Smirnov two-sample test.

The Wilcoxon matched-pairs test is based upon matched-pairs differences. The absolute values of the differences
of the pre-SFAS No. 52 \( \overline{VRE}_t \) and the post-SFAS No. 52 \( \overline{VRE}_t \) were ranked from top to bottom. The positive matched-pairs differences were summed (T) and used to test the first null hypothesis of the third set of hypotheses. Since the test sample size was relatively large for this type of test, the normal curve was used. The normal deviate for the sample is calculated by:

\[
Z = \frac{T - \mu_T}{\sigma_T} = \frac{T - \frac{N(N + 1)}{4}}{\sqrt{\frac{N(N + 1)(2N + 1)}{24}}}
\]

The value for \( N \) is determined by the number of nonzero differences. The zero differences represent ties between the pre-SFAS No. 52 and the post-SFAS No. 52 and were eliminated.

The Mann-Whitney two-sample test and Kolmogorov-Smirnov two-sample test were also used to test the effects of SFAS No. 52 on volatility of earnings. However, the measure of volatility of reported earnings in the pre and post-SFAS No. 52 for these two tests is the coefficient of variation (COV). The Mann-Whitney test focuses on the mean of the volatility while Kolmogorov-Smirnov test incorporates the dispersion and skewness into the analysis in addition to examining the central tendency.

The adoption of SFAS No. 52 would generally have an impact on reported earnings of MNCs. This impact, however,
might differ considerably from industry to industry and from company to company. For example, the impact of SFAS No. 52 on earnings would be greater among those MNCs that have extensive foreign operations and designate the local currencies as the functional currencies because the unrealized translation adjustments are included in equity rather than in income. MNCs without extensive foreign operations or that designate the U.S. dollar as the functional currency of their foreign operations would likely be affected to the same extent that they were affected by SFAS No. 8.

To test the second null hypothesis of the third set of hypotheses, the extension of the median test, a nonparametric test, was used to examine whether size of foreign operations or type of industry have any effect on the volatility of reported earnings. To apply this test, the test group firms were first categorized according to the (a) major industry group (two-digit SIC code); size of foreign sales, \( SFS_{jt} \); and (c) size of foreign assets, \( SFA_{jt} \). Then, for each of these three measures, the \( VRE_{jt} \) values were used to determine the median score for the combined samples (K) of scores. Each score was replaced by a plus if the score was larger than the common median and by a minus if it was smaller than the common median. The resulting dichotomous sets of scores were cast into a \( K \times 2 \) table, with the numbers in the body of the table representing the
frequencies of pluses and minuses in each of the K groups.
To test the second null hypothesis of the third set of
hypotheses, the value $X^2$ was computed by:

$$X^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where

$O_{ij}$ = observed number of cases categorized in ith row
of jth column;

$E_{ij}$ = number of cases expected under the null hypo-
thesis to be categorized in ith row of jth
column; and

$df = (K - 1)$

Test Periods

The overall test period for this study begins in
January, 1976 and ends in December, 1984. This overall
period is sub-divided into the following periods:

The Estimation Periods.--The parameters of the market
model were estimated by fitting the least squares regression
over a 48 month period beginning January, 1976 and ending
December, 1980. The parameters of the volume model were
estimated from a time series, ordinary least squares regres-
sion based upon observations from a 52-week period beginning
January 1, 1980 and ending December 26, 1980.

The Test Periods.--The five test periods initially
selected to determine in which period, if any, SFAS No. 52
had an effect on security returns behavior are shown in Table Xa. The five test periods are (a) a twenty-four month period beginning January, 1980 and ending December, 1981; (b) a twenty-four month period beginning January, 1981 and ending December, 1982; (c) a twenty-four month period beginning January 1982 and ending December, 1984. The first test period is the pre-SFAS No. 52 period, and the last three test periods represent the post-SFAS No. 52 period.

To evaluate the effects of early adoption of SFAS No. 52 on security returns behavior, four test periods were selected. Table Xb shows these four test periods. The pre-SFAS No. 52 periods begins in January, 1981 and ends in December, 1981. The post-SFAS No. 52 periods are 1/1982-12/1982, 1/1983-12/1983, and 1/1984-12/1984.

To evaluate the effects of SFAS No. 52 on security volume, and to evaluate the effects of early adoption of SFAS No. 52 on security volume, a 19-week period was selected. This test period begins October 5, 1981 and ends February 12, 1982. The first eight weeks of this period represent the pre-SFAS No. 52 period, and the last eight weeks represent the post-SFAS No. 52 period.
TABLE X

VARIOUS TEST PERIODS

a. Test Periods for Security Returns Analysis

Jan. '80  Jan. '81  Jan. '82  Jan. '83  Jan. '84  Dec. '84

b. Test Periods for Early Adoption Analysis

Jan. '81  Jan. '82  Jan. '83  Jan. '84  Dec. '84
CHAPTER BIBLIOGRAPHY


CHAPTER V

ANALYSIS AND INTERPRETATION OF TESTS RESULTS

The analysis and interpretation of the results of this study are discussed in the next three sections. These sections include (a) analysis and interpretation of the capital market reaction to SFAS No. 52, (b) analysis and interpretation of the capital market reaction to the early adoption of SFAS No. 52, and (c) analysis and interpretation of the effects of SFAS No. 52 on the volatility of reported earnings.

Analysis and Interpretation of the Market Reaction to SFAS No. 52

This section covers the results of the various cross-sectional and time series tests conducted to examine the effects of SFAS No. 52 on security return and volume distributions. In analyzing the actual results of the cross-sectional tests conducted to measure the effects of SFAS No. 52, the hypotheses to be tested concern whether the security return and volume behavior of MNCs are significantly different from the security return and volume behavior of the control firms, in the pre-SFAS No. 52 and post-SFAS No. 52 periods. The four possible results of the comparisons of the security return and volume distributions of test and control firms are presented in Table XI.
TABLE XI

POSSIBLE RESULTS OF THE COMPARISONS OF RETURN AND VOLUME DISTRIBUTIONS OF TEST AND CONTROL FIRMS

<table>
<thead>
<tr>
<th>Pre-SFAS No. 52 Period Result</th>
<th>Not Different</th>
<th>Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Different</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Different</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

The various results of the comparisons may be interpreted as follows.

1. Cell 1 indicates that SFAS No. 52 had no impact on the security return or volume distributions of MNCs because it is not informationally different from SFAS No. 8, implying that hypotheses $H_{Q_r}$ or $H_{Q_v}$ cannot be rejected. This result is expressed as follows:

$$\text{CAR}_{\text{PRM}} = \text{CAR}_{\text{PRD}} = \text{CAR}_{\text{POD}} = \text{CAR}_{\text{POM}}$$

where

- $\text{CAR} = \text{Cumulative Average Residual} = U_t$,
- $\text{PRM} = \text{Pre-SFAS No. 52 for MNCs}$,
- $\text{PRD} = \text{Pre-SFAS No. 52 for domestic firms}$,
- $\text{POD} = \text{Post-SFAS No. 52 for domestic firms}$, and
- $\text{POM} = \text{Post-SFAS No. 52 for MNCs}$.

2. Cell 2 indicates that SFAS No. 52 had impact on the security return or volume distributions of MNCs because SFAS
No. 52 is informationally different from SFAS No. 8, implying that \( H_0 \) and \( H_Q \) should be rejected. This result can be expressed as follows:

\[
\text{CAR}_{PRM} = \text{CAR}_{PRD} = \text{CAR}_{POD} \neq \text{CAR}_{POM}
\]

3. The results of the comparisons indicated by Cell 3 can be expressed as follows:

\[
\text{CAR}_{PRM} \neq \text{CAR}_{PRD} = \text{CAR}_{POD} = \text{CAR}_{POM}
\]

There is no good explanation for this outcome. One possibility is that the differences in the security returns and/or volume distributions of MNCs in the pre- and post-SFAS No. 52 may be the result of general economic conditions other than SFAS No. 52. Another possibility is that it was not possible to randomly assign firms to the control sample.

4. The result indicated by Cell 4 is difficult to interpret. This result can be expressed as follows:

\[
\text{CAR}_{PRM} \neq \text{CAR}_{PRD} \neq \text{CAR}_{POD} \neq \text{CAR}_{POM}
\]

One explanation of this result is that in the pre-SFAS No. 52 there was some systematic factor affecting economic values of securities in the sample, which was correlated with the translation method of SFAS No. 8. Then, the interpretation of the post-SFAS No. 52 result becomes ambiguous.

**Effect on Security Return Distributions**

The detailed results of the cross-sectional and time-series tests on the effects of SFAS No. 52 on security return distributions are presented in this section.
Cross-Sectional Analysis.--The results of the cross-sectional tests on monthly security returns for each of the five test periods are provided in Table XII. The cumulative average residuals (CAR) of test and control firms, in the pre- and post-SFAS No. 52 periods, are compared in part A of Table XII. In each of the five test periods, both MNCs and domestic firms had negative CAR. However, MNCs had higher CAR than domestic firms in each of the test periods. For all post-SFAS No. 52 periods, the standard deviation of CAR for MNCs is less than the standard deviation of CAR for domestic firms. The CAR of MNCs seems to have increased in the post-SFAS No. 52 period 1981-1982 before decreasing slightly in the period 1982-1983 and again in the period 1983-1984. The CAR of domestic firms can be seen to have also increased in the post-SFAS No. 52 period 1981-1982 and again in the period 1982-1983 before decreasing slightly in the period 1983-1984. The overall comparisons of the CAR of MNCs and domestic firms in the pre- and post-SFAS No. 52 periods indicate that the CAR of MNCs increased from -0.0218 in the 24 months preceding the issuance of SFAS No. 52 to -0.0141 in the 36 months post-SFAS No. 52 period. On the other hand, the CAR of domestic firms declined from -0.0316 to -0.378 in the same periods.

Part B of Table XII shows the results of the cross-sectional comparisons of the mean residuals of the
TABLE XII

RESULTS OF THE CROSS-SECTIONAL TEST ON SECURITY RETURNS
(TOTAL TEST FIRMS VS TOTAL CONTROL FIRMS)

A. Cumulative Average Residual for Test and Control Firms

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Test</th>
<th></th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1980-1981)</td>
<td>24</td>
<td>-.0218</td>
<td>.073</td>
<td>-.0871</td>
</tr>
<tr>
<td>2 (1981-1982)</td>
<td>24</td>
<td>-.0020</td>
<td>.042</td>
<td>-.3870</td>
</tr>
<tr>
<td>3 (1982-1983)</td>
<td>24</td>
<td>-.0068</td>
<td>.066</td>
<td>-.9304</td>
</tr>
<tr>
<td>4 (1983-1984)</td>
<td>24</td>
<td>-.0169</td>
<td>.084</td>
<td>-.9930</td>
</tr>
<tr>
<td>5 (1982-1984)</td>
<td>36</td>
<td>-.0141</td>
<td>.073</td>
<td>-.9930</td>
</tr>
</tbody>
</table>

<sup>a</sup>N = Number of months.

<sup>b</sup>S.D. = Standard Deviation.

<sup>c</sup>Min. = Minimum Value.

<sup>d</sup>Max. = Maximum Value.
TABLE XII (Continued)

B. Results of Tests on Security Return Differences

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N^a</th>
<th>(Test-Control)^b Means of Return Differences</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1980-1981)</td>
<td>24</td>
<td>0.0098</td>
<td>1.37</td>
</tr>
<tr>
<td>2 (1981-1982)</td>
<td>24</td>
<td>0.0195</td>
<td>2.33*</td>
</tr>
<tr>
<td>3 (1982-1983)</td>
<td>24</td>
<td>0.0210</td>
<td>2.02**</td>
</tr>
<tr>
<td>4 (1983-1984)</td>
<td>24</td>
<td>0.0248</td>
<td>2.27***</td>
</tr>
<tr>
<td>5 (1982-1984)</td>
<td>36</td>
<td>0.0237</td>
<td>2.26****</td>
</tr>
</tbody>
</table>

^Statistically significant at 0.05 (two-tail, 226.49 DF); **Statistically significant at 0.05 (two-tail, 254.89 DF); ***Statistically significant at 0.05 (two-tail, 293.19 DF); ****Statistically significant at 0.05 (two-tail, 269.78 DF).

^N = Number of months.

^Number of test firms=274, and number of control firms=204.
### TABLE XIII
SUMMARY RESULTS OF TESTS ON AVERAGE RESIDUALS OF TEST GROUP FIRMS

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>(Before-After) Mean of Return Difference</th>
<th>Std. Deviation of Return Differences</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1980-1981) vs (1981-1982)</td>
<td>24</td>
<td>-0.0198</td>
<td>0.030</td>
<td>-10.83*</td>
</tr>
<tr>
<td>2 (1980-1981) vs (1981-1983)</td>
<td>24</td>
<td>-0.0150</td>
<td>0.064</td>
<td>-3.89**</td>
</tr>
<tr>
<td>3 (1980-1981) vs (1981-1984)</td>
<td>24</td>
<td>-0.0049</td>
<td>0.083</td>
<td>-0.97</td>
</tr>
<tr>
<td>4 (1980-1981) vs (1981-1984)</td>
<td>36</td>
<td>-0.0071</td>
<td>0.071</td>
<td>-1.81***</td>
</tr>
</tbody>
</table>

*Statistically significant at 0.01 (two-tail, 273 DF);
**Statistically significant at 0.01 (two-tail, 273 DF);
***Statistically significant at 0.10 (two-tail, 273 DF).

<sup>a</sup>N = Number of months.
test and control firms. The mean return differences and the t-value are shown for each of the five test periods over which comparisons are made. For a given test period, the mean return of MNCs is compared with the mean return of the control group firms. As expected, there was no significant difference between the mean returns of the two groups, using a two-tailed t test, in the pre-SFAS No. 52 period 1980-1981. However, in the four post-SFAS No. 52 periods 1981-1982, 1982-1983, 1983-1984, and 1982-1984, the mean returns are significantly different at the 5% level. It seems unlikely that these results are due to a random chance. The behavior of these abnormal security returns suggests that the issuance of SFAS No. 52 had an effect on the security return distributions of MNCs vis-a-vis the domestic firms. These results, therefore, place the outcome of the cross-sectional tests in cell 2 of Table XI, implying that the null hypothesis $H_0$ should be rejected.

**Time-Series Analysis.**—Given that a significant difference in abnormal returns exists between MNCs and control group firms, the next step is to compare the mean returns of MNCs for a given test period (pre-SFAS No. 52 period) with the mean returns for another test period of interest (post-SFAS No. 52 period). Results of time-series tests on average residuals are shown in Table XIII. The mean of
return difference, standard deviation of return differences, and t-value is shown for the four comparisons. The comparisons between the pre-SFAS No. 52 period 1980-1981 and the post-SFAS No. 52 periods 1981-1982 and 1982-1983 are significant at the 1% confidence level, while the comparisons between the pre-SFAS No. 52 period 1980-1981 and the post-SFAS No. 52 period 1982-1984 are significant at the 10% level. However, the comparison of the average residuals of the pre-SFAS No. 52 period 1980-1981 versus the residuals of the post-SFAS No. 52 period 1983-1984 shows no significant difference. It can be seen that the mean returns of MNCs in the post-SFAS No. 52 periods were significantly higher than the mean returns of MNCs in the pre-SFAS No. 52, implying that SFAS No. 52 improved the stock prices of MNCs.

The results of the cross-sectional and time-series comparisons lead to the conclusion that the security returns distributions of MNCs, as measured by means of residuals, were affected in the post-SFAS No. 52 periods 1981-1982, 1982-1983, 1982-1984, and also in 1983-1984, though not as strongly as in the other three post-SFAS No. 52 periods. These results are inconsistent with other research studies. For example, Ndubizu and Jain (4) indicated that security returns behavior of firms affected by SFAS No. 52 was not significantly different from the return behavior of comparable unaffected firms (4, p. 18).
Effect on Security Volume Distributions

A reaction in the capital market to SFAS No. 52 may not be revealed in the security return tests alone. Beaver (1) indicated that the security price test reflects changes in the expectations of the capital market as a whole while volume tests reflects changes in the expectations of individual market agents. If individual market agents are correct in their anticipation of the impact of SFAS No. 52 on the future earnings of MNCs, then one would expect a large shifting of portfolio positions in the pre-SFAS No. 52 period, relative to the post-SFAS No. 52 period. The results of the various tests on the impact of SFAS No. 52 on security volume are presented in this section.

Volume Analysis-Unadjusted for Market Influences.--The mean volume ($V_t$) of test and control firms was computed for each of the 19 weeks surrounding the issuance of SFAS No. 52. The resulting scores are listed in Table XIV with their corresponding means and standard deviations. The mean of $V_t$ for MNCs is greater than the mean of $V_t$ for control firms. Also, the standard deviation of $V_t$ for MNCs is greater than the standard deviation of $V_t$ for control firms. Next, the $V_t$ of MNCs and control firms were compared to determine if their means and variances were equal. The t-test was used for testing the difference between the means of $V_t$ for MNCs and control firms. To test the equality of the variances of
### TABLE XIV

**MEAN VOLUME ($V_t$) OF TEST AND CONTROL FIRMS**

<table>
<thead>
<tr>
<th>Week</th>
<th>Test ($V_t \times 100$)</th>
<th>S.D.</th>
<th>Control ($V_t \times 100$)</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9</td>
<td>0.159537</td>
<td>0.00116504</td>
<td>0.164943</td>
<td>0.00243820</td>
</tr>
<tr>
<td>-8</td>
<td>0.152524</td>
<td>0.00127532</td>
<td>0.146243</td>
<td>0.00190448</td>
</tr>
<tr>
<td>-7</td>
<td>0.128237</td>
<td>0.00125107</td>
<td>0.126445</td>
<td>0.00224856</td>
</tr>
<tr>
<td>-6</td>
<td>0.157300</td>
<td>0.00178501</td>
<td>0.140904</td>
<td>0.00194616</td>
</tr>
<tr>
<td>-5</td>
<td>0.173329</td>
<td>0.00187433</td>
<td>0.138935</td>
<td>0.0017727</td>
</tr>
<tr>
<td>-4</td>
<td>0.198121</td>
<td>0.00262978</td>
<td>0.156374</td>
<td>0.0017783</td>
</tr>
<tr>
<td>-3</td>
<td>0.168523</td>
<td>0.00218828</td>
<td>0.141941</td>
<td>0.00128418</td>
</tr>
<tr>
<td>-2</td>
<td>0.169655</td>
<td>0.00266013</td>
<td>0.137381</td>
<td>0.00139880</td>
</tr>
<tr>
<td>-1</td>
<td>0.177589</td>
<td>0.00234107</td>
<td>0.135251</td>
<td>0.00143917</td>
</tr>
<tr>
<td>0</td>
<td>0.190895</td>
<td>0.00229497</td>
<td>0.143036</td>
<td>0.00144691</td>
</tr>
<tr>
<td>1</td>
<td>0.182653</td>
<td>0.00417636</td>
<td>0.156100</td>
<td>0.00209184</td>
</tr>
<tr>
<td>2</td>
<td>0.176265</td>
<td>0.00308707</td>
<td>0.148928</td>
<td>0.00140388</td>
</tr>
<tr>
<td>3</td>
<td>0.137365</td>
<td>0.00143386</td>
<td>0.130797</td>
<td>0.00110474</td>
</tr>
<tr>
<td>4</td>
<td>0.135153</td>
<td>0.00157440</td>
<td>0.150157</td>
<td>0.00141728</td>
</tr>
<tr>
<td>5</td>
<td>0.150745</td>
<td>0.00123946</td>
<td>0.136814</td>
<td>0.00192165</td>
</tr>
<tr>
<td>6</td>
<td>0.154351</td>
<td>0.00113456</td>
<td>0.129472</td>
<td>0.00122191</td>
</tr>
<tr>
<td>7</td>
<td>0.160035</td>
<td>0.00142168</td>
<td>0.127211</td>
<td>0.00125046</td>
</tr>
<tr>
<td>8</td>
<td>0.262800</td>
<td>0.01558500</td>
<td>0.144497</td>
<td>0.00146987</td>
</tr>
<tr>
<td>9</td>
<td>0.207458</td>
<td>0.00742239</td>
<td>0.115644</td>
<td>0.00102686</td>
</tr>
</tbody>
</table>

\[
\bar{X} = 0.170659 \\
\text{S.D.} = 0.0003056
\]

\[
\bar{X} = 0.140583 \\
\text{S.D.} = 0.0001196
\]

*aNumber of MNCs = 227, and number of domestic firms = 187.*
### TABLE XV

**Tests of Differences in the Means and Variances of Volume Distributions of Test and Control Firms**

<table>
<thead>
<tr>
<th>Level of Significance (36 d.f.)</th>
<th>Critical t&lt;sup&gt;a&lt;/sup&gt;</th>
<th>t-value</th>
<th>Level of Significance (20 d.f.)</th>
<th>Critical t&lt;sup&gt;b&lt;/sup&gt;</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>.100</td>
<td>1.69</td>
<td>3.99*</td>
<td>.100</td>
<td>1.86</td>
<td>6.53*</td>
</tr>
<tr>
<td>.050</td>
<td>2.03</td>
<td>3.99*</td>
<td>.050</td>
<td>2.22</td>
<td>6.53*</td>
</tr>
<tr>
<td>.025</td>
<td>2.32</td>
<td>3.99*</td>
<td>.025</td>
<td>2.71</td>
<td>6.53*</td>
</tr>
<tr>
<td>.010</td>
<td>2.72</td>
<td>3.99*</td>
<td>.010</td>
<td>3.29</td>
<td>6.53*</td>
</tr>
<tr>
<td>.005</td>
<td>3.59</td>
<td>3.99*</td>
<td>.005</td>
<td>3.74</td>
<td>6.53*</td>
</tr>
</tbody>
</table>

<sup>a</sup>Source: Snedecor and Cochran (6, p. 549).

<sup>b</sup>Source: Snedecor and Cochran (6, pp. 561, 566).

*Statistically significant.*
$V_t$ for MNCs and control firms, the F-test was used. The results of both sets of tests are presented in Table XV. The $t$-test confirms that the mean of $V_t$ for MNCs is significantly greater than the mean of $V_t$ for control firms at all the specified levels of significance. Also, the F-test shows a significant difference in the variance of $V_t$ for MNCs and control firms at all specified levels of significance.

These statistical results are presented graphically in Figure 4. One can see that the volume of trading for MNCs was higher than the volume of trading for domestic firms in the 19-week test period. The mean volume of MNCs in week 0 was 33.5 percent larger than the mean volume of domestic firms, and it was the second largest difference observed during the 15 weeks surrounding the issuance of SFAS No. 52. Figure 4 also shows that the volatility of volume of trading for MNCs relative to the domestic firms was larger during the test period.

The dotted line in Figure 4 denotes the average value of $V_t$ in the 52 weeks estimation period, which was 0.175013. The mean volume of MNCs in week 0 was higher than the mean volume during the estimation period by 8.1 percent. Nine weeks prior to the issuance of SFAS No. 52, means volume of MNCs were below normal, except in week -4. During the two weeks following the issuance of SFAS No. 52, week 0, the means volume of MNCs were slightly above normal volume.
FIGURE 4

WEEKLY AVERAGE OF THE DAILY PERCENTAGE OF SHARES TRADED
OF TEST AND CONTROL SAMPLE FIRMS

Legend
1-MNCs  2-Domestic Firms  3-Average $V_t \times 100$ during estimation period
The behavior of $\overline{V}_c$ presented in Table XIV and Figure 4 may imply that the capital market reacted favorably to the SFAS No. 52 policy change. However, it seems unlikely that SFAS No. 52 was responsible for these results. It may be true that individual market agents were cognizant of the favorable anticipatory effects of the SFAS No. 52 policy change on the market returns and earnings of MNCs. That is, individual market agents appear to be shifting their portfolio positions toward firms that have stronger future earnings potential. However, their behavior cannot be explained by portfolio shifts between domestic firms stocks and MNCs stocks since the buying activity in one case is perfectly offset by selling activity in the other case. One plausible explanation may be that new investments were injected into the stocks of MNCs, which created a higher volume of trading during the test periods. Another possible explanation is that the higher volume of trading for MNCs was due to unspecified market-wide events.

Volume Analysis-Adjusted for Market Influences.--The results of tests on mean volume residuals, which attempt to remove the effects of market-wide events upon the individual security volume, are presented in this section. The weekly mean volume residuals ($\overline{e}_j$) of test and control firms are provided in Tables XVI and XVII, respectively. In each of the 19 weeks, the mean volume residuals of MNCs was higher
<table>
<thead>
<tr>
<th>Week</th>
<th>Mean</th>
<th>S.D.</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9</td>
<td>0.249235</td>
<td>0.02613058</td>
<td>-0.462512</td>
<td>39.488615</td>
<td>10.48</td>
</tr>
<tr>
<td>-8</td>
<td>0.168265</td>
<td>0.02604990</td>
<td>-0.382608</td>
<td>39.289525</td>
<td>15.48</td>
</tr>
<tr>
<td>-7</td>
<td>0.184466</td>
<td>0.02614140</td>
<td>-0.410896</td>
<td>39.436952</td>
<td>14.17</td>
</tr>
<tr>
<td>-6</td>
<td>0.189139</td>
<td>0.02608698</td>
<td>-0.396758</td>
<td>39.320878</td>
<td>13.79</td>
</tr>
<tr>
<td>-5</td>
<td>0.193163</td>
<td>0.02608916</td>
<td>-0.394894</td>
<td>39.323588</td>
<td>13.50</td>
</tr>
<tr>
<td>-4</td>
<td>0.196633</td>
<td>0.02612288</td>
<td>-0.436248</td>
<td>39.265217</td>
<td>13.28</td>
</tr>
<tr>
<td>-3</td>
<td>0.184766</td>
<td>0.02611253</td>
<td>-0.350152</td>
<td>39.306447</td>
<td>14.13</td>
</tr>
<tr>
<td>-2</td>
<td>0.191986</td>
<td>0.02619115</td>
<td>-0.368428</td>
<td>39.361937</td>
<td>13.64</td>
</tr>
<tr>
<td>-1</td>
<td>0.200380</td>
<td>0.02611155</td>
<td>-0.386808</td>
<td>39.304028</td>
<td>13.03</td>
</tr>
<tr>
<td>0</td>
<td>0.208341</td>
<td>0.02619043</td>
<td>-0.418545</td>
<td>39.435234</td>
<td>12.57</td>
</tr>
<tr>
<td>1</td>
<td>0.164807</td>
<td>0.02643567</td>
<td>-0.396071</td>
<td>39.437994</td>
<td>16.04</td>
</tr>
<tr>
<td>2</td>
<td>0.205648</td>
<td>0.02621072</td>
<td>-0.351810</td>
<td>39.341576</td>
<td>12.74</td>
</tr>
<tr>
<td>3</td>
<td>0.194105</td>
<td>0.02614275</td>
<td>-0.416857</td>
<td>39.435113</td>
<td>13.46</td>
</tr>
<tr>
<td>4</td>
<td>0.201039</td>
<td>0.02617107</td>
<td>-0.443094</td>
<td>39.466815</td>
<td>13.01</td>
</tr>
<tr>
<td>5</td>
<td>0.187180</td>
<td>0.02609370</td>
<td>-0.353225</td>
<td>39.374012</td>
<td>13.94</td>
</tr>
<tr>
<td>6</td>
<td>0.178108</td>
<td>0.02610979</td>
<td>-0.331827</td>
<td>39.397437</td>
<td>14.65</td>
</tr>
<tr>
<td>7</td>
<td>0.188073</td>
<td>0.02606878</td>
<td>-0.368108</td>
<td>39.325534</td>
<td>13.86</td>
</tr>
<tr>
<td>8</td>
<td>0.253893</td>
<td>0.02834456</td>
<td>-0.517828</td>
<td>39.249098</td>
<td>11.16</td>
</tr>
<tr>
<td>9</td>
<td>0.223106</td>
<td>0.02699688</td>
<td>-0.444198</td>
<td>39.296874</td>
<td>12.10</td>
</tr>
</tbody>
</table>

\( ^a \) Number of MNCs in the test sample = 227  
\( ^b \) S.D. = Standard Deviation  
\( ^c \) Mean, Minimum and Maximum Value = \( \overline{c} \_x \times 100 \)  
\( ^d \) C.V. = Coefficient of Variation = \( \frac{\text{S.D.}}{\text{Mean}} \)
<table>
<thead>
<tr>
<th>Week</th>
<th>Mean&lt;sup&gt;c&lt;/sup&gt;</th>
<th>S.D.&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Minimum&lt;sup&gt;c&lt;/sup&gt; Value</th>
<th>Maximum&lt;sup&gt;c&lt;/sup&gt; Value</th>
<th>C.V.&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9</td>
<td>0.101124</td>
<td>0.00251255</td>
<td>-0.304692</td>
<td>2.862941</td>
<td>2.48</td>
</tr>
<tr>
<td>-8</td>
<td>-0.007718</td>
<td>0.00192160</td>
<td>-0.861205</td>
<td>1.256018</td>
<td>-24.89</td>
</tr>
<tr>
<td>-7</td>
<td>0.021284</td>
<td>0.00216265</td>
<td>-0.280118</td>
<td>2.077086</td>
<td>10.16</td>
</tr>
<tr>
<td>-6</td>
<td>0.006876</td>
<td>0.00193752</td>
<td>-0.647466</td>
<td>1.595378</td>
<td>28.17</td>
</tr>
<tr>
<td>-5</td>
<td>-0.010845</td>
<td>0.00186189</td>
<td>-0.896936</td>
<td>1.385741</td>
<td>17.16</td>
</tr>
<tr>
<td>-4</td>
<td>-0.018860</td>
<td>0.00204523</td>
<td>-1.322682</td>
<td>1.670611</td>
<td>-10.84</td>
</tr>
<tr>
<td>-3</td>
<td>-0.011044</td>
<td>0.00150948</td>
<td>-0.956192</td>
<td>0.674907</td>
<td>-13.66</td>
</tr>
<tr>
<td>-2</td>
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<td>0.00146235</td>
<td>-0.679883</td>
<td>0.825102</td>
<td>-17.01</td>
</tr>
<tr>
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<td>-0.010362</td>
<td>0.00146219</td>
<td>-0.721051</td>
<td>0.670880</td>
<td>-14.11</td>
</tr>
<tr>
<td>0</td>
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<td>0.00159838</td>
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<td>0.759515</td>
<td>-18.69</td>
</tr>
<tr>
<td>1</td>
<td>-0.038006</td>
<td>0.00240025</td>
<td>-1.732103</td>
<td>1.453726</td>
<td>-6.31</td>
</tr>
<tr>
<td>2</td>
<td>0.011422</td>
<td>0.00131903</td>
<td>-0.461866</td>
<td>0.751220</td>
<td>-11.54</td>
</tr>
<tr>
<td>3</td>
<td>0.026977</td>
<td>0.00103621</td>
<td>-0.204624</td>
<td>0.463075</td>
<td>3.84</td>
</tr>
<tr>
<td>4</td>
<td>0.057561</td>
<td>0.00140710</td>
<td>-0.279273</td>
<td>0.608002</td>
<td>2.44</td>
</tr>
<tr>
<td>5</td>
<td>0.008300</td>
<td>0.00199357</td>
<td>-0.552463</td>
<td>2.179690</td>
<td>24.01</td>
</tr>
<tr>
<td>6</td>
<td>-0.012750</td>
<td>0.00141491</td>
<td>-0.783180</td>
<td>0.840741</td>
<td>-7.54</td>
</tr>
<tr>
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<td>0.00144306</td>
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<td>0.828336</td>
<td>-12.62</td>
</tr>
<tr>
<td>8</td>
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<td>0.00180388</td>
<td>-1.590818</td>
<td>0.508481</td>
<td>-4.58</td>
</tr>
<tr>
<td>9</td>
<td>-0.038382</td>
<td>0.00137583</td>
<td>-1.078427</td>
<td>0.404415</td>
<td>-3.58</td>
</tr>
</tbody>
</table>

<sup>a</sup>Number of control firms = 186  
<sup>b</sup>S.D. = Standard Deviation  
<sup>c</sup>Mean, Minimum and Maximum Value = $\bar{x}$ x 100  
<sup>d</sup>C.V. = Coefficient of Variation = (S.D.)/(Mean)
than the mean volume residuals of domestic firms. Also, the
standard deviation of $\bar{e}_j$ for MNCs was higher than the
standard deviation of $\bar{e}_j$ for domestic firms during the same
period. From the values of the coefficient of variation, it
seems that the mean volume residuals of MNCs was more vola-
tile than the mean volume residuals of domestic firms during
the test period.

The data included in Tables XVI and XVII are presented
graphically in Figure 5. Figure 5 shows that the weekly
means of volume residual for MNCs were all positive during
the 19-week test period. This was not the case for domestic
firms. During the same period, domestic firms had a nega-
tive weekly means of volume residual in 12 weeks. A posi-
tive residual implies above normal volume; negative, below
normal; and zero, normal volume. Visual inspection of
Figure 5 indicates a pattern of $\bar{e}_j$s which is quite similar
to the pattern of $V_\tau$s in Figure 4. There was a large peak
in week 0, where the difference between the $\bar{e}_j$ of MNCs and
that of domestic firms was the largest difference observed
during the 15 weeks surrounding the issuance of SFAS No. 52.

The results of the cross-sectional comparisons of the
cumulative average mean volume residuals ($\bar{e}_{jt}$) of test and
control firms, which attempt to remove any effects of
market-wide factors on the individual security volume, are
presented in Table XVIII. The period 10/5/81-12/4/81 represents the pre-SFAS No. 52 period, and the period 12/14/81-2/12/82 represents the post-SFAS No. 52 period. In each of these two test periods, both MNCs and domestic firms had positive $\bar{e}_{jt}$. The $\bar{e}_{jt}$ of MNCs was lower than the $\bar{e}_{jt}$ of domestic firms in the pre-SFAS No. 52 period. The situation was reversed in the post-SFAS No. 52 period. The $t$-test was employed for testing the difference between the $\bar{e}_{jt}$ of MNCs and domestic firms in the pre- and post-SFAS No. 52 periods. Table XVIII indicates that there was no significant difference between the cumulative average mean volume residuals of MNCs and domestic firms, using a two-tailed $t$-test and 5% level of significance, in the pre- and post-SFAS No. 52 periods. Given that the volume distributions of the two groups are not significantly different in either of the two test periods, this outcome is placed in cell 1 of Table XI, implying that the null hypothesis $H_0$ cannot be rejected.

The results of the over-time comparison of the $\bar{e}_{jt}$ of MNCs for the pre-SFAS No. 52 period with the $\bar{e}_{jt}$ for the post-SFAS No. 52 period are shown in Table XIX. The means of volume residual difference, the standard deviation of volume residual difference, and the $t$-value are shown for the test period over which the comparison is made. Table XIX indicates that the $\bar{e}_{jt}$ of MNCs in the pre-SFAS No. 52
period is less than the $\bar{e}_{jt}$ in the post-SFAS No. 52 period, and the t-test shows this difference to be not significant at the 1%, 5%, and 10% levels of significance.

**Evaluation of Tests on Security Returns and Volume**

The significant results of the cross-sectional and time-series tests on security return distributions lead to the conclusion that security return distributions of MNCs were affected in all the post-SFAS No. 52 periods. Therefore, one should reject the null hypothesis of no effects due to SFAS No. 52. The results of the cross-sectional and time-series tests on security volume lead to the conclusion that volume distributions of test and control groups were not significantly different, although the volatility of volume trading for MNCs relative to domestic firms was higher during the test periods. The cumulative average mean volume residuals ($\bar{e}_{jt}$) provides a better explanation of the rapidity and variability of the capital market reaction to SFAS No. 52 than the weekly mean volume ($\bar{V}_t$).

**Analysis and Interpretation of the Market Reaction to the Early Adoption of SFAS No. 52**

This section covers the results of the various tests conducted to examine the effects of the early adoption of SFAS No. 52 on security return and volume distributions. In analyzing the actual results of the cross-sectional and
FIGURE 5

WEEKLY MEAN VOLUME RESIDUAL
OF TEST AND CONTROL FIRMS

Legend
1-MNCs  2-Domestic Firms
## TABLE XVIII

**ANALYSIS OF MEAN VOLUME RESIDUAL**  
**-(ADJUSTED FOR MARKET INFLUENCES)-**

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N(^a)</th>
<th>Cumulative Average Mean Volume Residuals(^b)</th>
<th>Mean of Volume Residual Differences(^c)</th>
<th>t-value</th>
<th>Pooled(^d) S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/5/81-12/4/81</td>
<td>9</td>
<td><strong>Test</strong> 0.033177, <strong>Control</strong> 0.036628</td>
<td>-0.003451</td>
<td>-0.16</td>
<td>0.227339</td>
</tr>
<tr>
<td>12/14/81-2/12/82</td>
<td>9</td>
<td><strong>Test</strong> 0.057446, <strong>Control</strong> 0.022722</td>
<td>0.034724</td>
<td>-0.97</td>
<td>0.382375</td>
</tr>
</tbody>
</table>

\(^a\)N = Number of weeks  
\(^b\)Cumulative Average Mean Volume Residuals = \(\bar{e}_{jt} \times 100\).  
\(^c\)Mean of Volume Residual Difference = (Test - Control) \times 100.  
\(^d\)Pooled S.D. = Pooled Standard Deviation \times 100.  
\(^e\)Number of test firms = 227, Number of control firms = 186.
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Period:</strong></td>
<td>(10/5/81-12/4/81) vs (12/14/81-2/12/82)</td>
<td></td>
</tr>
<tr>
<td><strong>N(^a)</strong></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Pre-SFAS No. 52 Average Mean Volume Residuals(^b)</td>
<td>0.033177</td>
<td></td>
</tr>
<tr>
<td>Post-SFAS No. 52 Average Mean Volume Residuals(^b)</td>
<td>0.057446</td>
<td></td>
</tr>
<tr>
<td>Means of Volume Residual Difference(^c)</td>
<td>-0.024269</td>
<td></td>
</tr>
<tr>
<td>Standard Deviation of Volume Residual Difference(^d)</td>
<td>0.385366</td>
<td></td>
</tr>
<tr>
<td>t-Value</td>
<td>-0.57</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Number of weeks in the pre- and post-SFAS No. 52.

\(^b\)Average Mean Volume Residuals = \(\bar{e}_j\) x 100.

\(^c\)Means of Volume Residual Difference = Mean Volume Residuals for the pre-SFAS No. 52 less Mean Volume Residuals for the post-SFAS No. 52.

\(^d\)Pooled Standard Deviation x 100.
time-series tests, the hypotheses to be tested concerned whether or not there was a difference between the market reaction to early adopters as opposed to late adopters of SFAS No. 52 in terms of security returns and volume.

**Effects of Early Adoption of SFAS No. 52 on Security Return Distributions**

The results of the cross-sectional comparisons between the CAR of early adopters and late adopters in each of the four test periods are shown in Table XX. Part A of Table XX shows the CAR, standard deviations, and the minimum and maximum values for early and late adopters in the pre- and post-SFAS No. 52 periods. In the 1981 pre-SFAS No. 52 period, both early and late adopters had positive CAR. The early adopters, however, had higher CAR than late adopters. The CAR of early adopters decreased in 1982 before increasing in 1983, and then decreased sharply in 1984. Early adopters had negative CAR in 1982 and 1984. The CAR of late adopters also decreased in 1982 before increasing slightly in 1983, and then decreased sharply in 1984. In all the post-SFAS No. 52 periods, late adopters had negative CAR. Part A also shows that the standard deviation of CAR for early adopters was lower than the standard deviation of CAR for late adopters in all the four test periods.

The results of the cross-sectional comparisons of the CAR of early and late adopters are shown in part B of Table
XX. For a given test period, the CAR of early adopters is compared with the CAR of late adopters. The \( t \)-test shows that there was no significant difference between the CAR of the early and late adopters in the pre- and post-SFAS No. 52 test periods. These results suggest that the early adoption of SFAS No. 52 had no effect on the security return distributions of early adopters vis-a-vis the later adopters, implying that the null hypothesis \( H'_0 \) cannot be rejected.

It is very probable that the capital market anticipated that early adopters (it should be remembered that they are all voluntary) complied because their earnings positions were not so strong in any event, regardless of a possible favorable impact from SFAS No. 52. In other words, the market probably was reluctant to expect high earnings performance from the early adoption of SFAS No. 52. These explanations are inconsistent with the early adopters management perception of SFAS No. 52 with respect to its effect on future earnings and stock prices. Evans and Folks (3) noted that 82.8 percent of the early adopters that responded to their questionnaire indicated that the reason for the early adoption of SFAS No. 52 was the anticipated effect on the volatility of future earnings and stock prices. The results of the cross-sectional tests, however, are consistent with the late adopters' perception of SFAS No. 52 with respect to its effect on stock prices. Ndubizu and Jain (4) indicated that
late adopters believed that SFAS No. 8 is preferred to SFAS No. 52 with respect to its effect on stock prices, and believe that "explains why late adopters did not adopt SFAS No. 52 before the effective date" (4, pp. 13-14).

The results of the over-time comparisons of the CAR for early and late adopters in the pre-SFAS No. 52 period with the CAR for early and late adopters in the post-SFAS No. 52 periods are shown in Table XXI. The mean of return difference, the standard deviation of return difference, and the t-value are provided for the test periods over which the comparisons are made. The pre-SFAS No. 52 period is 1981, and the post-SFAS No. 52 test periods are 1982, 1983, and 1984. Part A of Table XXI shows that the comparisons between 1981 and the post-SFAS No. 52 periods 1982 and 1984 are significant at the 1% confidence level, while the comparison between 1981 and 1983 shows no significant difference. Part B of Table XXI shows the comparisons of the CAR for late adopters. One can see that the comparisons between 1981 and 1982 were significant at the 5% confidence level, the comparisons between 1981 and 1983 were significant at the 10% level, and the comparisons between 1981 and 1984 were significant at the 1% level. These results imply that the additional information or signals sent by the early adoption of SFAS No. 52, if any, did not cause the capital market to react differently to early adopters as opposed to
TABLE XX

RESULTS OF THE CROSS-SECTIONAL TEST ON MONTHLY RETURN (EARLY ADOPTERS VS LATE ADOPTERS)

A. Cumulative Average Residual for Early and Late Adopters

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Early Adopters&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Late Adopters&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Return</td>
<td>S.D.&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Min.&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>1 1981</td>
<td>12</td>
<td>.0068</td>
<td>.035</td>
</tr>
<tr>
<td>2 1982</td>
<td>12</td>
<td>-.0035</td>
<td>.042</td>
</tr>
<tr>
<td>3 1983</td>
<td>12</td>
<td>.0018</td>
<td>.047</td>
</tr>
<tr>
<td>4 1984</td>
<td>12</td>
<td>-.0266</td>
<td>.103</td>
</tr>
</tbody>
</table>

<sup>a</sup>N = Number of months.

<sup>b</sup>Number of Early Adopters = 126 MNCs.

<sup>c</sup>Number of Late Adopters = 148 MNCs.

<sup>d</sup>S.D. = Standard Deviation

<sup>e</sup>Min. = Minimum Value.

<sup>f</sup>Max. = Maximum Value.
<table>
<thead>
<tr>
<th>Test Period</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>(EA-LA)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1/81-12/81)</td>
<td>12</td>
<td>0.0043</td>
<td>1.00</td>
</tr>
<tr>
<td>2 (1/82-12/82)</td>
<td>12</td>
<td>0.0090</td>
<td>1.15</td>
</tr>
<tr>
<td>3 (1/83-12/83)</td>
<td>12</td>
<td>0.0131</td>
<td>1.50</td>
</tr>
<tr>
<td>4 (1/84-12/84)</td>
<td>12</td>
<td>0.0038</td>
<td>0.29</td>
</tr>
</tbody>
</table>

<sup>a</sup>N = Number of months.

<sup>b</sup>(EA-LA) = Mean Return of Early Adopters less Mean Return of Late Adopters.
### TABLE XXI
RESULTS OF TESTS ON AVERAGE RESIDUALS

#### A. Early Adopters

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N</th>
<th>(Before-After) Mean of Return Difference</th>
<th>Std. Deviation of Return Differences</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1981 vs 1982</td>
<td>12</td>
<td>0.0103</td>
<td>0.039</td>
<td>2.99*</td>
</tr>
<tr>
<td>2 1981 vs 1983</td>
<td>12</td>
<td>0.0050</td>
<td>0.058</td>
<td>0.95</td>
</tr>
<tr>
<td>3 1981 vs 1984</td>
<td>12</td>
<td>0.0334</td>
<td>0.105</td>
<td>3.59**</td>
</tr>
</tbody>
</table>

*Statistically significant at 0.01 (two-tail, 125 DF);
**Statistically significant at 0.01 (two-tail, 125 DF);

*N = Number of months.

#### B. Late Adopters

<table>
<thead>
<tr>
<th>Test Period</th>
<th>N</th>
<th>(Before-After) Mean of Return Difference</th>
<th>Std. Deviation of Return Differences</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1981 vs 1982</td>
<td>12</td>
<td>0.0150</td>
<td>0.086</td>
<td>2.13*</td>
</tr>
<tr>
<td>2 1981 vs 1983</td>
<td>12</td>
<td>0.0137</td>
<td>0.098</td>
<td>1.70**</td>
</tr>
<tr>
<td>3 1981 vs 1984</td>
<td>12</td>
<td>0.0329</td>
<td>0.117</td>
<td>3.43***</td>
</tr>
</tbody>
</table>

*Statistically significant at 0.05 (two-tail, 147 DF);
**Statistically significant at 0.10 (two-tail, 147 DF);
***Statistically significant at 0.01 (two-tail, 147 DF).
late adopters. These results of time-series comparisons do confirm the results of the tests included in Tables XII and XIII. That is, SFAS No. 52 had an effect on the security return distributions of MNCs.

**Effects of Early Adoption of SFAS No. 52 on Security Volume Distributions**

Given that no significant difference in the CAR exists between early and late adopters, the next step is to examine if there were substantial adjustments in the behavior of volume of trading for early and late adopters subsequent to SFAS No. 52. The various tests on the impact of the early adoption of SFAS No. 52 on security volume are covered in this section.

**Volume Analysis-Unadjusted for Market Influences.**—The mean volume ($V_t$) of early and late adopters are listed in Table XXII with their corresponding means and standard deviations. The mean and standard deviation of $V_t$ of early adopters were smaller than the mean and standard deviation of $V_t$ for late adopters. From the values of the coefficient of variation, the volatility of $V_t$ for early adopters increased in week -1, stayed volatile in week 0 and then declined in the later weeks. On the other hand, the volatility of $V_t$ for late adopters increased in week -6, stayed volatile in the next ten weeks, and then came down to levels comparable to the volatility of $V_t$ for early adopters before increasing sharply in week 8 and 9.
The $V_t$ of early and late adopters were compared to determine if their means and variance were equal. The t-test was used for testing the difference between the means of $V_t$ for early and late adopters. To test the equality of the variances of $V_t$ for early and late adopters, the F-test was used. The results of both sets of tests are presented in Table XXIII. The t-test confirms that the mean of $V_t$ for early adopters is significantly smaller than the mean of $V_t$ for late adopters at all the specified levels of significance. However, the F-test shows no significant difference in the variance of the two distributions.

The results included in Table XXII are presented graphically in Figure 6. Figure 6 shows that the volume of trading for late adopters was higher than the volume of trading for early adopters in the 19-week test period. The dotted line denotes the average value of $V_t$ for MNCs in the 52 weeks estimation period. The value of $V_t$ for early adopters during the test period were below the average value of $V_t$ during the estimation period. The week experiencing the largest value of $V_t$ for early adopters was in the week of the issuance of SFAS No. 52, week 0. Figure 6 also shows that the values of $V_t$ for late adopters during the test period were generally above the average value of $V_t$ during the estimation period.
TABLE XXII
MEAN VOLUME ($V_t$) OF EARLY AND LATE ADOPTERS

<table>
<thead>
<tr>
<th>Week</th>
<th>Early Adopters(^a)</th>
<th>Late Adopters(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean(^b)</td>
<td>S.D.(^c)</td>
</tr>
<tr>
<td>-9</td>
<td>0.133989</td>
<td>0.00104754</td>
</tr>
<tr>
<td>-8</td>
<td>0.132743</td>
<td>0.00119132</td>
</tr>
<tr>
<td>-7</td>
<td>0.106392</td>
<td>0.00103786</td>
</tr>
<tr>
<td>-6</td>
<td>0.116557</td>
<td>0.00084624</td>
</tr>
<tr>
<td>-5</td>
<td>0.135786</td>
<td>0.00135141</td>
</tr>
<tr>
<td>-4</td>
<td>0.164782</td>
<td>0.00139865</td>
</tr>
<tr>
<td>-3</td>
<td>0.131519</td>
<td>0.00113022</td>
</tr>
<tr>
<td>-2</td>
<td>0.136524</td>
<td>0.00132338</td>
</tr>
<tr>
<td>-1</td>
<td>0.140122</td>
<td>0.00162112</td>
</tr>
<tr>
<td>0</td>
<td>0.171976</td>
<td>0.00202822</td>
</tr>
<tr>
<td>1</td>
<td>0.141706</td>
<td>0.00125640</td>
</tr>
<tr>
<td>2</td>
<td>0.136229</td>
<td>0.00126402</td>
</tr>
<tr>
<td>3</td>
<td>0.122486</td>
<td>0.00111936</td>
</tr>
<tr>
<td>4</td>
<td>0.117038</td>
<td>0.00109874</td>
</tr>
<tr>
<td>5</td>
<td>0.131904</td>
<td>0.00111115</td>
</tr>
<tr>
<td>6</td>
<td>0.133777</td>
<td>0.00098426</td>
</tr>
<tr>
<td>7</td>
<td>0.130918</td>
<td>0.00111273</td>
</tr>
<tr>
<td>8</td>
<td>0.156321</td>
<td>0.00140849</td>
</tr>
<tr>
<td>9</td>
<td>0.132385</td>
<td>0.00121195</td>
</tr>
</tbody>
</table>

\(X = 0.135429\)  \(S.D. = 0.0157613\)  \(X = 0.206199\)  \(S.D. = 0.0511319\)

\(^a\)Number of Early Adopters = 115, Number of Late Adopters = 113
\(^b\)Mean = $V_t \times 100$
\(^c\)S.D. = Standard Deviation
TABLE XXIII

TESTS OF DIFFERENCES IN THE MEANS AND VARIANCES OF VOLUME DISTRIBUTIONS OF EARLY AND LATE ADOPTERS

<table>
<thead>
<tr>
<th>Level of Significance (36 d.f.)</th>
<th>t-test</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Critical \text{t}^a</td>
<td>\text{t-value}</td>
</tr>
<tr>
<td>.100</td>
<td>1.69</td>
<td>-5.76*</td>
</tr>
<tr>
<td>.050</td>
<td>2.03</td>
<td>-5.76*</td>
</tr>
<tr>
<td>.025</td>
<td>2.32</td>
<td>-5.76*</td>
</tr>
<tr>
<td>.010</td>
<td>2.72</td>
<td>-5.76*</td>
</tr>
<tr>
<td>.005</td>
<td>3.59</td>
<td>-5.76*</td>
</tr>
</tbody>
</table>

*Statistically significant.

\textsuperscript{a}Source: Snedecor and Cochran (6, p. 549).

\textsuperscript{b}Source: Snedecor and Cochran (6, pp. 561, 566).
FIGURE 6

WEEKLY AVERAGE OF THE DAILY PERCENTAGE OF SHARES TRADED OF EARLY AND LATE ADOPTERS

Legend
E - Early Adopters  L - Late Adopters
A - Average $V_t \times 100$ during estimation period
The results in Tables XXII and XXIII, and in Figure 6, are more difficult to interpret regarding the effect of the early adoption of SFAS No. 52 on security volume. Although the mean of $V_t$ for late adopters is significantly larger than the mean of $V_t$ for early adopters during the test period, the visual inspection of the plots of $V_t$ in Figure 6 implies that the difference in $V_t$'s existed in the 9 weeks prior to the week of the issuance of SFAS No. 52 as well as in the 9 weeks following the week of the issuance of SFAS No. 52. These results, therefore, suggest that the early adoption of SFAS No. 52 did not affect the security volume distributions of the early and late adopters.

Volume Analysis-Adjusted for Market Influences.—The weekly mean volume residuals ($e_j$) of early and late adopters are provided in Tables XXIV. In each of the 19 weeks, the value of $e_j$ of late adopters was higher than the value of $e_j$ of early adopters. From the values of the coefficient of variation, it seems that the mean volume residuals of early adopters was more volatile than the mean volume residuals of late adopters during the test period. Figure 7 shows the graphical presentation of the data included in Table XXIV. Figure 6 shows that the values of $e_j$ for late adopters were all positive during the 19-week test period. During the same period, the value of $e_j$ for early adopters were mostly negative. Figure 6 shows a pattern of $e_j$'s which is quite
similar to the pattern of $\nabla_t$s in Figure 6. The largest value of $e_j$ for early adopters occurred during the week of the issuance of SFAS No. 52 (week 0).

The results of the cross-sectional comparisons of the cumulative average mean volume residuals ($\bar{e}_{jt}$) of early and late adopters are presented in Table XXV. In each of the two test periods, early adopters had negative $\bar{e}_{jt}$, while late adopters had positive $\bar{e}_{jt}$. The t-test indicates that the cumulative average mean volume residuals of early and late adopters were significantly different at the 5% level of confidence in the pre-SFAS No. 52 period 10/5/81-12/4/81. Also, the cumulative average mean volume residuals of the two groups were significantly different at the 10% level in the post-SFAS No. 52 period 12/14/81-2/12/82. These results confirm the results included in Tables XXII and XXIII, and are difficult to interpret since the $\bar{e}_{jt}$ of late adopters is significantly larger than the $\bar{e}_{jt}$ of early adopters in the pre- and post-SFAS No. 52 periods. One plausible explanation of these results is that in the pre-SFAS No. 52 there was some systematic factor affecting the expectations of individual agents in the market during the pre-SFAS No. 52 period. The interpretation of the post-SFAS No. 52 period's result becomes ambiguous.

The results of the over-time comparison of the $\bar{e}_{jt}$ of early and late adopters in the pre-SFAS No. 52 period with
<table>
<thead>
<tr>
<th>Week</th>
<th>Mean(^b)</th>
<th>S.D.(^c)</th>
<th>Minimum(^b) Value</th>
<th>Maximum(^b) Value</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9</td>
<td>0.058440</td>
<td>0.00093353</td>
<td>-0.305739</td>
<td>0.401100</td>
<td>1.59</td>
</tr>
<tr>
<td>-8</td>
<td>-0.013554</td>
<td>0.00102665</td>
<td>-0.279751</td>
<td>0.579000</td>
<td>-7.57</td>
</tr>
<tr>
<td>-7</td>
<td>-0.002084</td>
<td>0.00085063</td>
<td>-0.360561</td>
<td>0.309300</td>
<td>-40.81</td>
</tr>
<tr>
<td>-6</td>
<td>-0.014546</td>
<td>0.00129839</td>
<td>-0.258537</td>
<td>0.852900</td>
<td>-8.93</td>
</tr>
<tr>
<td>-5</td>
<td>-0.006861</td>
<td>0.00148646</td>
<td>-0.284644</td>
<td>0.517000</td>
<td>-21.66</td>
</tr>
<tr>
<td>-4</td>
<td>0.001959</td>
<td>0.00117158</td>
<td>-0.362445</td>
<td>0.433300</td>
<td>59.79</td>
</tr>
<tr>
<td>-3</td>
<td>-0.014765</td>
<td>0.00127647</td>
<td>-0.348463</td>
<td>0.822200</td>
<td>-8.65</td>
</tr>
<tr>
<td>-2</td>
<td>-0.004191</td>
<td>0.00155913</td>
<td>-0.368428</td>
<td>1.110300</td>
<td>-37.20</td>
</tr>
<tr>
<td>-1</td>
<td>0.000397</td>
<td>0.00205158</td>
<td>-0.386808</td>
<td>0.663000</td>
<td>51.65</td>
</tr>
<tr>
<td>0</td>
<td>0.026121</td>
<td>0.00204050</td>
<td>-0.418545</td>
<td>1.603310</td>
<td>7.81</td>
</tr>
<tr>
<td>1</td>
<td>-0.038636</td>
<td>0.00120198</td>
<td>-0.396071</td>
<td>0.867100</td>
<td>-3.11</td>
</tr>
<tr>
<td>2</td>
<td>0.002693</td>
<td>0.00117229</td>
<td>-0.351810</td>
<td>0.795900</td>
<td>43.53</td>
</tr>
<tr>
<td>3</td>
<td>0.014841</td>
<td>0.00105385</td>
<td>-0.259330</td>
<td>0.446370</td>
<td>7.10</td>
</tr>
<tr>
<td>4</td>
<td>0.017983</td>
<td>0.00112545</td>
<td>-0.330226</td>
<td>0.461700</td>
<td>6.25</td>
</tr>
<tr>
<td>5</td>
<td>0.005244</td>
<td>0.00101191</td>
<td>-0.353225</td>
<td>0.372600</td>
<td>19.29</td>
</tr>
<tr>
<td>6</td>
<td>-0.005436</td>
<td>0.00126271</td>
<td>-0.293855</td>
<td>0.636780</td>
<td>-23.23</td>
</tr>
<tr>
<td>7</td>
<td>-0.003586</td>
<td>0.00159156</td>
<td>-0.368108</td>
<td>0.820610</td>
<td>-44.38</td>
</tr>
<tr>
<td>8</td>
<td>-0.013522</td>
<td>0.00132434</td>
<td>-0.444400</td>
<td>0.390030</td>
<td>-9.79</td>
</tr>
<tr>
<td>9</td>
<td>-0.014377</td>
<td>0.00125330</td>
<td>-0.381862</td>
<td>0.589500</td>
<td>-8.72</td>
</tr>
</tbody>
</table>

\(^a\)Number of Early Adopters = 115  \(^c\)S.D. = Standard Deviation

\(^b\) Mean, Minimum and Maximum Value = \(e_j \times 100\)
TABLE XXIV (Continued)

A. Late Adopters\(^a\)

<table>
<thead>
<tr>
<th>Week</th>
<th>Mean</th>
<th>S.D.</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9</td>
<td>0.094468</td>
<td>0.00135085</td>
<td>-0.462515</td>
<td>0.527992</td>
<td>1.42</td>
</tr>
<tr>
<td>-8</td>
<td>0.005487</td>
<td>0.00127337</td>
<td>-0.382608</td>
<td>0.494067</td>
<td>23.20</td>
</tr>
<tr>
<td>-7</td>
<td>0.025299</td>
<td>0.00147800</td>
<td>-0.410896</td>
<td>0.677845</td>
<td>5.84</td>
</tr>
<tr>
<td>-6</td>
<td>0.048327</td>
<td>0.00226380</td>
<td>-0.396758</td>
<td>1.116044</td>
<td>4.68</td>
</tr>
<tr>
<td>-5</td>
<td>0.048671</td>
<td>0.00211523</td>
<td>-0.394894</td>
<td>1.410465</td>
<td>4.34</td>
</tr>
<tr>
<td>-4</td>
<td>0.047290</td>
<td>0.00345118</td>
<td>-0.436248</td>
<td>3.133329</td>
<td>7.29</td>
</tr>
<tr>
<td>-3</td>
<td>0.039844</td>
<td>0.00281480</td>
<td>-0.350152</td>
<td>1.821492</td>
<td>7.06</td>
</tr>
<tr>
<td>-2</td>
<td>0.043262</td>
<td>0.00355001</td>
<td>-0.346059</td>
<td>3.149254</td>
<td>8.20</td>
</tr>
<tr>
<td>-1</td>
<td>0.056082</td>
<td>0.00282464</td>
<td>-0.247094</td>
<td>2.155898</td>
<td>5.03</td>
</tr>
<tr>
<td>0</td>
<td>0.045033</td>
<td>0.00245986</td>
<td>-0.273315</td>
<td>1.628622</td>
<td>5.46</td>
</tr>
<tr>
<td>1</td>
<td>0.022501</td>
<td>0.00561008</td>
<td>-0.377557</td>
<td>5.483012</td>
<td>24.93</td>
</tr>
<tr>
<td>2</td>
<td>0.064063</td>
<td>0.00412926</td>
<td>-0.341566</td>
<td>3.389628</td>
<td>6.44</td>
</tr>
<tr>
<td>3</td>
<td>0.027689</td>
<td>0.00169655</td>
<td>-0.416857</td>
<td>1.346857</td>
<td>6.12</td>
</tr>
<tr>
<td>4</td>
<td>0.038230</td>
<td>0.00203997</td>
<td>-0.443094</td>
<td>1.318322</td>
<td>5.33</td>
</tr>
<tr>
<td>5</td>
<td>0.023941</td>
<td>0.00124262</td>
<td>-0.322001</td>
<td>0.767281</td>
<td>5.19</td>
</tr>
<tr>
<td>6</td>
<td>0.016202</td>
<td>0.00111049</td>
<td>-0.331827</td>
<td>0.445804</td>
<td>6.85</td>
</tr>
<tr>
<td>7</td>
<td>0.035079</td>
<td>0.00141991</td>
<td>-0.288073</td>
<td>0.775058</td>
<td>4.04</td>
</tr>
<tr>
<td>8</td>
<td>0.178583</td>
<td>0.01613180</td>
<td>-0.517828</td>
<td>17.108321</td>
<td>9.03</td>
</tr>
<tr>
<td>9</td>
<td>0.116907</td>
<td>0.01026376</td>
<td>-0.444198</td>
<td>10.825418</td>
<td>8.77</td>
</tr>
</tbody>
</table>

\(^a\)Number of Late Adopters = 113
FIGURE 7

WEEKLY MEAN VOLUME RESIDUAL

E - Early Adopters
L - Late Adopters

\( \bar{\varepsilon}_j \times 100 \)

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

Week
<table>
<thead>
<tr>
<th>Test Period</th>
<th>N</th>
<th>Cumulative Average Mean Volume Residuals</th>
<th>Mean of Volume Residual Differences</th>
<th>t-value</th>
<th>Pooled S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EA^e</td>
<td>LA^f</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/5/81-12/4/81</td>
<td>9</td>
<td>-0.003347</td>
<td>0.039975</td>
<td>-0.043323</td>
<td>-2.20*</td>
</tr>
<tr>
<td>12/14/81-2/12/82</td>
<td>9</td>
<td>-0.002166</td>
<td>0.059613</td>
<td>-0.061779</td>
<td>-1.87**</td>
</tr>
</tbody>
</table>

^aStatistically significant at 0.05 (two-tail, 112 DF);
^bStatistically significant at 0.10 (two-tail, 112 DF);

^aN = Number of weeks;

^bCumulative Average Mean Volume Residuals = \( \bar{e}_j \times 100 \);

^cMean of Volume Residual Difference = (EA - LA) \times 100;

^dPooled S.D. = Pooled Standard Deviation \times 100;

^eEA = Number of Early Adopters = 115;

^fLA = Number of Late Adopters = 113.
TABLE XXVI

SUMMARY RESULTS OF TEST ON WEEKLY VOLUME RESIDUALS OF EARLY AND LATE ADOPTERS

Test Period: (10/5/81-12/4/81) vs (12/4/81-2/12/82)\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Early Adopters</th>
<th>Late Adopters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of Volume Residual Difference x 100(^b)</td>
<td>-0.001181</td>
<td>-0.019638</td>
</tr>
<tr>
<td>Pooled Standard Deviation x 100</td>
<td>0.065797</td>
<td>0.372717</td>
</tr>
<tr>
<td>(t)-Value</td>
<td>-0.21</td>
<td>-0.56</td>
</tr>
</tbody>
</table>

\(^a\)Number of weeks in each period is 9 weeks;

\(^b\)Means of volume residual difference = Mean volume residuals for the pre-SFAS No. 52 period (10/5/81-12/4/81) less mean volume residuals for the post-SFAS No. 52 period (12/14/81-2/12/82).
the $\bar{e}_{jt}$ of early and late adopters in the post-SFAS No. 52 period are shown in Table XXVI. The mean of volume residuals, the standard deviation of volume residual difference, and the $t$-value are shown for the test periods over which the comparison is made. Part A of Table XXVI shows that the $e_{jt}$ of early adopters in the pre-SFAS No. 52 period is less than the $\bar{e}_{jt}$ in the post-SFAS No. 52 period, and the $t$-test shows this difference to be not statistically significant. Part B of Table XXVI shows the comparison between the $\bar{e}_{jt}$ of late adopters in the pre-SFAS No. 52 and the $\bar{e}_{jt}$ in the post-SFAS No. 52 period. One can see that the $\bar{e}_{jt}$ in the pre-SFAS No. 52 period was less than the $\bar{e}_{jt}$ in the post-SFAS No. 52 period, and the $t$-test shows that this difference is not statistically significant.

The results of the over-time tests imply that the volume distributions of early and late adopters were not affected by the early adoption of SFAS No. 52, which lead to the conclusion that the null hypothesis $H_0$ cannot be rejected. However, the results of the cross-sectional tests are not so clear. The existence of the significant difference between the $\bar{e}_{jt}$ of early and late adopters in the pre-SFAS No. 52 test period made the interpretation of the result in the post-SFAS No. 52 test period more difficult.
Analysis and Interpretation of Effects on Volatility of Reported Earnings of MNCs

The volatility of earnings reported by MNCs over time is investigated in this section. Several analyses were used to test the effects of SFAS No. 52 vis-a-vis SFAS No. 8 on the volatility of reported earnings of MNCs.

The Impact of Foreign Exchange on Earnings

The test results on the effects of foreign exchange adjustment on the volatility of reported earnings of MNCs are provided in Table XXVII. The average values of the absolute exchange adjustment as a percentage of operating income are shown in part A of Table XXVII. The mean exchange adjustment increased in 1980 and then again in 1981 and 1982, before decreasing slightly in 1983. The data in part A also indicate a rather dramatic increase in the mean exchange adjustment in 1982, the second year of the three-year adoption window. The mean exchange adjustment in 1982 is 88.8 percent larger than the mean exchange adjustment in 1981.

Results of Wilcoxon Test.--To test the effects of SFAS No. 52 vis-a-vis SFAS No. 8 on the volatility of reported earnings of MNCs, a Wilcoxon matched-pairs signed-ranks test was used. The average impact of foreign exchange on earnings ($\text{VRE}_t$) was computed for each MNC across the two years prior to the adoption of SFAS No. 52, and also across the
two years following the adoption of SFAS No. 52. Part B of Table XXVII shows the results of the Wilcoxon test. The results indicate that the difference between the average impact of foreign exchange under SFAS No. 8 ($\overline{VRE_t}$) and the average impact of foreign exchange under SFAS No. 52 ($\overline{VRE_{ta}}$) to be statistically significant at the 1% level of confidence. The results of Wilcoxon test imply that there was a change in the volatility of reported earnings of MNCs resulting from the change in the accounting treatment of translation adjustments embodied in SFAS No. 52, and, therefore, the null hypothesis $H_0$ should be rejected.

A better measure of the volatility of reported earnings is the coefficient of variation (COV) of quarterly net income of MNCs since it measures relative variability as opposed to absolute variability. The coefficient of variation is the ratio of the standard deviation to the mean, expressed as follows:

$$\text{COV} = \frac{\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2/n}{n - 1} \times \frac{n}{\sum_{i=1}^{n} x_i}$$

where

$X =$ quarterly net income, and

$n =$ number of firms.

The Mann-Whitney two-sample test and Kolmogorov-Smirnov two-sample test were used to test the effects on volatility of
earnings of SFAS No. 52 vis-a-vis SFAS No. 8. These tests were performed only on the early adopters as a matter of convenience. Table XXVIII shows the results of these two tests.

Results of Mann-Whitney U Test.--The Mann-Whitney test focuses on the mean of the volatility of reported earnings. Part A of Table XXVIII shows that the pre- and post-SFAS No. 52 earnings volatilities for the sample firms (early adopters) are not significantly different at the 1%, 5%, or 10% level of significance, implying that SFAS No. 52 did not affect the volatility of reported earnings of MNCs.

Results of Kolmogorov-Smirnov Test.--The Kolmogorov-Smirnov test incorporates the dispersion and skewness into the analysis in addition to examining the central tendency. Part B of Table XXVIII shows that the volatility of reported earnings of the sample firms in the pre- and post-SFAS No. 52 are not significantly different at the 1%, 5%, or 10% levels of significance, implying that the volatility of reported earnings was not affected by SFAS No. 52.

Evaluation of Tests on Volatility of Earnings.--The results of the Mann-Whitney and Kolmogorov-Smirnov tests clearly indicate that SFAS No. 52 did not have any effect on the volatility of reported earnings of MNCs, even though unrealized translation gains or losses are excluded from net income under SFAS No. 52. Therefore, one cannot reject the null hypothesis \( H_0 \) of no change in the volatility of
TABLE XXVII

RESULTS OF TESTS ON THE EFFECT OF EXCHANGE ADJUSTMENT AS A PERCENTAGE OF OPERATING INCOME ON THE VOLATILITY OF EARNINGS

A. Mean Absolute Exchange Adjustment as a Percentage of Operating Income of Test Group Firms*

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean (%)</th>
<th>Standard Deviation</th>
<th>Minimum Value (%)</th>
<th>Maximum Value (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>1.77</td>
<td>3.78</td>
<td>0</td>
<td>31.2</td>
</tr>
<tr>
<td>1980</td>
<td>1.86</td>
<td>4.29</td>
<td>0</td>
<td>41.7</td>
</tr>
<tr>
<td>1981</td>
<td>6.64</td>
<td>8.02</td>
<td>0</td>
<td>523.8</td>
</tr>
<tr>
<td>1982</td>
<td>12.54</td>
<td>20.89</td>
<td>0</td>
<td>584.3</td>
</tr>
<tr>
<td>1983</td>
<td>9.82</td>
<td>31.82</td>
<td>0</td>
<td>470.0</td>
</tr>
</tbody>
</table>

*Number of MNCs = 274

B. Wilcoxon Matched-Pairs Signed-Ranks Test

<table>
<thead>
<tr>
<th>Mean Rank</th>
<th>Cases</th>
<th>- Ranks ($\overline{\Delta RE}<em>{ta}^b$ Less Than $\overline{\Delta RE}</em>{tb}^a$)</th>
<th>+ Ranks ($\overline{\Delta RE}<em>{ta}^b$ Greater Than $\overline{\Delta RE}</em>{tb}^b$)</th>
<th>Ties ($\overline{\Delta RE}<em>{ta}^b$ Equal $\overline{\Delta RE}</em>{tb}^b$)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>118.61</td>
<td>196</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64.04</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>226</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wilcoxon T Value = 1728

Z Value = -11.1544*

*Statistically significant at 0.01 (two-tailed p).

$^a\overline{\Delta RE}_{tb} = $ Exchange Adjustment as a percentage of operating income in the Pre-SFAS No. 52;

$^b\overline{\Delta RE}_{ta} = $ Exchange Adjustment as a percentage of operating income in the Post-SFAS No. 52.
TABLE XXVIII

COMPARISON OF PRE AND POST-SFAS NO. 52 EARNINGS\(^a\)
VOLATILITIES FOR TEST GROUP FIRMS

A. Mann-Whitney U Test

<table>
<thead>
<tr>
<th>Test Periods(^b)</th>
<th>Mean Rank</th>
<th>Z-Score</th>
<th>1-Tailed P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/76-12/81</td>
<td>124.96</td>
<td>-0.9958</td>
<td>0.1597</td>
</tr>
<tr>
<td>1/82-12/84</td>
<td>116.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Kolmogorov-Smirnov Two-Sample Test

<table>
<thead>
<tr>
<th>Test Periods(^b)</th>
<th>Absolute</th>
<th>Positive</th>
<th>Negative</th>
<th>Z-Score</th>
<th>1-Tailed P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1/76-12/81) vs (1/82-12/84)</td>
<td>0.11667</td>
<td>0.02500</td>
<td>-0.11667</td>
<td>0.904</td>
<td>0.1940</td>
</tr>
</tbody>
</table>

\(^a\)Number of MNCs (Early Adopters only) = 120.

earnings due to SFAS No. 52. These results are inconsistent with the results of the Wilcoxon test. The researcher believes that the results of the Mann-Whitney and Kolmogorov-Smirnov tests are more appropriate in testing the effects of SFAS No. 52 on volatility of reported earnings because the coefficient of variation of quarterly net income is a better measure of earnings variability than the measure used in Wilcoxon test.

**Tests on Impact of Foreign Operations on Earnings**

The results of tests on the impact of foreign operations on earnings of MNCs are covered in this section. MNCs with very extensive foreign operations are likely to have their financial statements substantially affected by SFAS No. 52. For MNCs with limited foreign operations, however, SFAS No. 52 is not expected to have a significant impact on their financial reporting. Several measures of magnitude of foreign operations were used to test the effect on earnings. These measures are size of foreign sales ($SFS_{jt}$), size of foreign assets ($SFA_{jt}$), industry classification, and $VRE_{jt}$. As Dukes (2, p. 52) indicated, these measures adjust for the overall size of the MNC, and are more appropriate than absolute magnitude measures such as total foreign sales or total foreign assets, which do not capture the importance of foreign operations to each MNC. The extension of the median test (5, pp. 179-184) was used to test the effect of foreign operations on earnings.
Impact of Foreign Assets.--Table XXIX shows the results of the effect of size of foreign assets on earnings of MNCs in the pre- and post-SFAS No. 52 periods. MNCs in the test sample were divided into 7 groups according to the magnitude of their foreign assets as a percentage of total assets (SFA_{jt}). Then, the extension of median test was used to determine whether the volatility of reported earnings, measured by VRE_{jt}, is independent of the size of foreign assets. It should be noted that no distinction has been made as to whether foreign assets are monetary or nonmonetary, and no attempt has been made to determine whether foreign assets are covered by foreign currency denominated borrowings.

Part A of Table XXIX shows the results of the extension of median test in the pre-SFAS No. 52 period. The results show that the $X^2$ statistic is not significant in the pre-SFAS No. 52 period. These unexpected results imply that the impact of exchange adjustments on earnings of MNCs was not affected by the size of foreign assets under SFAS No. 8. The lower part of Table XXIX shows the test results in the post-SFAS No. 52 period. The $X^2$ statistic is significant at the 1% level in the post-SFAS No. 52 period, implying that the impact of exchange adjustments on reported earnings of MNCs was significantly affected by the size of foreign assets under SFAS No. 52.
TABLE XXIX

RESULTS OF TEST ON THE EFFECTS OF THE SIZE OF FOREIGN ASSETS ON VOLATILITY OF EARNINGS OF MNCs

A. Pre-SFAS No. 52

Size of Foreign Assets as a Percentage of Total Assets

<table>
<thead>
<tr>
<th>Size of Foreign Assets (%)</th>
<th>0-9.9</th>
<th>10-19.9</th>
<th>20-29.9</th>
<th>30-39.9</th>
<th>40-49.9</th>
<th>50-59.9</th>
<th>60-70</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms whose VRE is more than common median</td>
<td>10</td>
<td>37</td>
<td>30</td>
<td>13</td>
<td>16</td>
<td>6</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td>No. of firms whose VRE is less than common median</td>
<td>18</td>
<td>23</td>
<td>29</td>
<td>23</td>
<td>14</td>
<td>7</td>
<td>1</td>
<td>115</td>
</tr>
<tr>
<td>TOTAL</td>
<td>28</td>
<td>60</td>
<td>59</td>
<td>36</td>
<td>30</td>
<td>13</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

\[ x^2 (6 DF) = 8.85 \ (p = 18.23) \]
TABLE XXIX (Continued)

B. Post-SFAS No. 52

Size of Foreign Assets as a Percentage of Total Assets

<table>
<thead>
<tr>
<th></th>
<th>0-9.9</th>
<th>10-19.9</th>
<th>20-29.9</th>
<th>30-39.9</th>
<th>40-49.9</th>
<th>50-59.9</th>
<th>60-70</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms</td>
<td>30</td>
<td>38</td>
<td>28</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>115</td>
</tr>
<tr>
<td>whose VREjt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>were more than</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No. of firms</td>
<td>7</td>
<td>28</td>
<td>31</td>
<td>26</td>
<td>16</td>
<td>4</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td>whose VREjt</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>were less than</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>common median</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| TOTAL           | 37    | 66      | 59      | 34      | 22      | 9       | 2     |

\[ x^2 \ (6 \ DF) = 33.01 \ (p = 0.01) * \]

*Statistically significant at 0.01 (one-tailed).
Impact of Foreign Sales.--The results of the effect of size of foreign sales on volatility of earnings in the pre- and post-SFAS No. 52 periods are shown in Table XXX. MNCs in the test sample were divided into eight groups according to the magnitude of their foreign sales as a percentage of total sales ($SFS_{jt}$). Then, the extension of median test was used to test for a difference in the impact of exchange adjustments on reported earnings among MNCs with different size of foreign sales. It should be noted that no attempt has been made to determine the currency in which foreign sales were denominated due to the lack of adequate disclosure on this item.

Part A of Table XXX shows that the $X^2$ statistic is not statistically significant in the pre-SFAS No. 52 period, implying that the impact of exchange adjustments on earnings under SFAS No. 8 was not affected by the size of foreign sales. Part B, on the other hand, shows that the $X^2$ statistic is significant at the 1% level of confidence in the post-SFAS No. 52, implying that there was a difference in the impact of foreign exchange adjustments on earnings among MNCs with difference size of foreign sales.

Impact of Industry Classification.--Table XXXI shows the results of the effects of industry classifications on reported earnings of MNCs in the pre- and post-SFAS No. 52 periods. MNCs were categorized based on their industry
TABLE XXX
RESULTS OF TEST ON THE EFFECTS OF THE SIZE OF FOREIGN SALES
ON VOLATILITY OF EARNINGS OF MNCs

A. Pre-SFAS No. 52

<table>
<thead>
<tr>
<th>Size of Foreign Assets as a Percentage of Total Sales</th>
<th>0-9.9</th>
<th>10-19.9</th>
<th>20-29.9</th>
<th>30-39.9</th>
<th>40-49.9</th>
<th>50-59.9</th>
<th>60-70</th>
<th>GT 70(^a)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms whose VREij were more than common median</td>
<td>13</td>
<td>34</td>
<td>29</td>
<td>18</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td>No. of firms whose VREij were less than common median</td>
<td>8</td>
<td>24</td>
<td>31</td>
<td>24</td>
<td>16</td>
<td>5</td>
<td>7</td>
<td>0</td>
<td>115</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>58</td>
<td>60</td>
<td>42</td>
<td>25</td>
<td>12</td>
<td>9</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

\[ X^2 \ (7 \ DF) = 10.86 \ (p = 14.49) \]

\(^a\)GT 70 = Greater Than 70
TABLE XXX (Continued)

B. Post-SFAS No. 52

Size of Foreign Assets as a Percentage of Total Sales

<table>
<thead>
<tr>
<th></th>
<th>0-9.9</th>
<th>10-19.9</th>
<th>20-29.9</th>
<th>30-39.9</th>
<th>40-49.9</th>
<th>50-59.9</th>
<th>60-70</th>
<th>GT 70&lt;sup&gt;a&lt;/sup&gt;</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms</td>
<td>22</td>
<td>38</td>
<td>25</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td>whose VRE_jt</td>
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<td>were more</td>
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<td></td>
<td>4</td>
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<td>35</td>
<td>25</td>
<td>19</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>115</td>
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<td>No. of firms</td>
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</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>58</td>
<td>60</td>
<td>37</td>
<td>25</td>
<td>15</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

\[ X^2 (7 \text{ DF}) = 33.49 \ (p = 0.01) \]

*Statistically significant at 0.01 (one-tailed).
<sup>a</sup>GT 70 = Greater Than 70.
classifications (two-digit SIC code). Table V shows that MNCs were diversified over 39 industries. However, only 12 industry classifications were used in the extension of median test to examine whether there was any difference in the impact of exchange adjustments on earnings among MNCs with different industry classification. According to Siegel (5, p. 178), for $X^2$ tests with degree of freedom larger than 1, fewer than 20 percent of the cells should have an expected frequency of less than 5, and no cell should have an expected frequency of less than 1. The only industry classifications to satisfy these requirements were the 12 classifications shown in Table XXXI.

Results of the test on the relationship between the impact of exchange adjustments on earnings and industry classifications in the pre-SFAS No. 52 period are shown in part A of Table XXXI. As in the case of foreign assets and foreign sales, the $X^2$ is not significant in the pre-SFAS No. 52 period, implying that the impact of exchange adjustments on earnings was not affected by the industry classification of MNCs under SFAS No. 8. Part B of Table XXXI shows the results of the test in the post-SFAS No. 52 period. The results show that the $X^2$ statistic is significant at the 5% level, implying that the industry classification had an effect on the impact of exchange adjustments on earnings of MNCs under SFAS No. 52.
At this stage some comments about the three measures of magnitude of foreign operations and what they might imply are appropriate. The size of foreign assets as a percentage of total assets \((SFA_{jt})\) appears to be the one most likely to measure economic exposure. Dukes (2, pp. 63-64) indicates that all assets denominated in a foreign currency, regardless of whether they are monetary or nonmonetary, are subject to uncertainty about their future value in U.S. dollars. Regardless of the accounting treatment of the effects of changes in foreign exchange rates, the greater a MNC's investment in foreign assets, the greater the risk concerning the future U.S. dollar value of the investment.

The size of foreign sales as a percentage of total sales does not capture whether the currency in which foreign sales are denominated is U.S. dollar or a foreign currency. If foreign sales are denominated in the U.S. dollar, then there is no exchange rate exposure on the sales transaction. However, if foreign sales are denominated in a foreign currency, it is not clear that the \(SFS_{jt}\) accurately captures the exchange rate exposure (2, p. 62). Finally, exchange adjustments as a percentage of operating income \((VRE_{jt})\) is not designed to measure economic exposure. It is designed to capture the impact of foreign exchange on earnings.

**Evaluation of Tests on Foreign Operations**.--The results of the extension of median test on the relationship between
TABLE XXXI

RESULTS OF TEST ON THE EFFECTS OF INDUSTRY CLASSIFICATIONS
ON VOLATILITY OF EARNINGS OF MNCs

A. Pre-SFAS No. 52

<table>
<thead>
<tr>
<th>Two-digit SIC Code Classifications</th>
<th>20</th>
<th>26</th>
<th>28</th>
<th>29</th>
<th>32</th>
<th>33</th>
<th>34</th>
<th>35</th>
<th>36</th>
<th>37</th>
<th>38</th>
<th>67</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms whose VREs were more frequent than common median of VRE_{jt}</td>
<td>7</td>
<td>6</td>
<td>15</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>15</td>
<td>10</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>94</td>
</tr>
<tr>
<td>No. of firms whose VREs were more frequent than common median of VRE_{jt}</td>
<td>5</td>
<td>5</td>
<td>30</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>93</td>
</tr>
<tr>
<td>TOTAL</td>
<td>12</td>
<td>11</td>
<td>45</td>
<td>16</td>
<td>7</td>
<td>8</td>
<td>15</td>
<td>27</td>
<td>17</td>
<td>9</td>
<td>12</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

\[ X^2 (11 \text{ DF}) = 13.64 \ (p = 24.77\%) \]
TABLE XXXI (Continued)

B. Post-SFAS No. 52

Two-digit SIC Code Classifications

<table>
<thead>
<tr>
<th></th>
<th>20</th>
<th>26</th>
<th>28</th>
<th>29</th>
<th>32</th>
<th>33</th>
<th>34</th>
<th>35</th>
<th>36</th>
<th>37</th>
<th>38</th>
<th>67</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms whose VREs were more frequent than common median of VRE_{jt}</td>
<td>6</td>
<td>5</td>
<td>17</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>86</td>
</tr>
<tr>
<td>No. of firms whose VREs were more frequent than common median of VRE_{jt}</td>
<td>6</td>
<td>6</td>
<td>28</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>12</td>
<td>18</td>
<td>8</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>101</td>
</tr>
<tr>
<td>TOTAL</td>
<td>12</td>
<td>11</td>
<td>45</td>
<td>16</td>
<td>7</td>
<td>8</td>
<td>15</td>
<td>27</td>
<td>17</td>
<td>9</td>
<td>12</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

\[ X^2 \ (11 \ DF) = 21.11 \ (p = 3.49)* \]

*Statistically significant at 0.05 (one-tailed).
size of foreign assets, size of foreign sales, and industry classifications and the impact of exchange adjustments on earnings of MNCs indicate that the impact of exchange adjustments on earnings is independent of the size of foreign assets, size of foreign sales, and industry classification under SFAS No. 8. For the post-SFAS No. 52 period, the test results indicate that the impact of exchange adjustments on earnings of MNCs was significantly affected by the magnitude of foreign assets, foreign sales, and by the industry classifications. Based on the results in the pre-SFAS No. 52 alone, one cannot reject the null hypothesis $H_0$. However, the test results in the post-SFAS No. 52 lead to the conclusion that the null hypothesis $H_0^2$ should be rejected.
CHAPTER BIBLIOGRAPHY


CHAPTER VI

LIMITATIONS, CONCLUSIONS, AND RECOMMENDATIONS
FOR FUTURE RESEARCH

Summary

Since the beginning of the period of floating exchange rates in 1973, the problem of translating foreign-currency-denominated financial statements has become an accounting problem of considerable economic importance. Prior to the issuance of SFAS No. 8, there was a marked inconsistency in this area of accounting. Though designed to make the diverse accounting practices of MNCs more compatible, SFAS No. 8 was not well received by management and investors alike, primarily because it increased the volatility of reported earnings of MNCs. Critics alleged that such increased earnings volatility would damage security prices. The poor reception of SFAS No. 8 eventually led to the issuance of SFAS No. 52, which differs significantly from SFAS No. 8 in its method and objectives of translation and in its treatment of exchange adjustments. The primary objective of this research study was to investigate the security market reaction to the issuance and adoption of SFAS No. 52, and its effect on earnings.

Conceptual Issues.--Some conceptual issues in foreign currency translation were discussed in Chapter II. Three
theories that have attempted to explain the mechanism of foreign exchange determination were reviewed. They are: (1) the PPP theory, (2) the International Fisher Effect, and (3) the Forward Rate Theory of Exchange Rate Expectations. Accounting and economic exposure were also defined. Accounting exposure was defined as the exchange adjustment that results from the need to translate foreign currency financial statements into the reporting currency for financial reporting purposes. Economic exposure was defined as the effects of changes in foreign exchange rates on future cash flows and the value of the MNC.

The objectives and methods of translation were then evaluated on the basis of their abilities to fulfill the perceived needs for translation. The four alternative reporting methods for translation of foreign financial statements were described and compared. They are: (1) current/noncurrent, (2) monetary/nonmonetary, (3) temporal method, and (4) current rate method. It was pointed out that the objective of the temporal method is consistent with a U.S.-dollar orientation, which implies that foreign-currency-denominated items are reported as if originally recorded in U.S. dollars. The current rate method, on the other hand, adopts a foreign-currency orientation, which implies that the relative magnitudes of the various accounts in the U.S. dollar statements are the same as in the original foreign currency statements.
The nature of and accounting treatments of exchange adjustments were then discussed. SFAS No. 8 adopted the "asset/liability" view, which maintains that unrealized translation gains and losses represent changes in the MNC's resources or obligations at the balance sheet date, and, therefore, they must be recognized in current period income statement to preserve the integrity of the balance sheet. SFAS No. 52 regards translation adjustments as an unrealized component of comprehensive income and should be reported separately from net income, and should be accumulated as a part of owners' equity. The three accounting treatments for translation gains and losses described are: (1) all-inclusive income method, (2) deferral method, and (3) equity adjustment method.

The requirements under several accounting promulgations on foreign currency translation were then summarized. The alleged problems caused by SFAS No. 8 were discussed. They are: (1) unnecessary volatility of reported earnings, (2) adverse effects on security prices, (3) economically incompatible results, and (4) suboptimal management decisions. The major features of SFAS No. 8 and SFAS No. 52 were also described and compared.

Prior Research.--The major theoretical and empirical research studies on accounting for foreign currency translation were reviewed in Chapter III. Studies by Rodriguez
(3), Dukes (1), and Fredrikson and Mogus (2) among others, failed to confirm the proposition that security returns were adversely affected at the time of initial implementation of SFAS No. 8. Dukes (1), however, found that in 1975-1976 MNCs with large foreign operations earned lower returns than MNCs of similar risk having minor foreign operations. Dukes attributes this result to a general weakening of the U.S. dollar, not to the accounting standard per se. Other studies examined the impact of the change embodied in SFAS No. 52 on the translation of Foreign currency financial statements. Troberg (5) and Taussig (4), among others, found that the current rate method promulgated by SFAS No. 52 was preferable over the temporal method in reflecting the financial results and relationships embodied in the foreign financial statements.

Research Design.--Six general hypotheses, dealing with the expected effects of SFAS No. 52 on security return and volume distributions and the impact on reported earnings, were first presented. The research design and methodology were then presented in Chapter IV. Two methods were used to evaluate the effects of SFAS No. 52 on security return and volume distributions. The first method (called cross-sectional tests) consists of cross-sectional comparisons of the CAR and cumulative average mean volume residuals of the test and control firms, and also for early and late adopters
of SFAS No. 52. The second method (called time-series tests) consists of the comparison of the CAR and cumulative average mean volume residuals of the test firms, early adopters, and late adopters over two periods.

The market model was used to obtain the average residual returns for the cross-sectional and time-series methods. The t-test of significance was used to check for CAR differences. Two volume analyses were performed. The first analysis was adjusted to remove the effects of the market-wide factors on the individual security's volume, and the second analysis was unadjusted for the capital market influences. A model analogous to the market model was used to obtain the average volume residuals for the cross-sectional and over-time comparisons used in the first volume analysis. The t-test was also used to check for mean of volume residual differences. In the second volume analysis, the t-test was used to check for differences in the mean volume and the F-test was used for differences in variance of mean volume.

Three nonparametric tests were used in examining the effects of SFAS No. 52 vis-a-vis SFAS No. 8 on reported earnings of MNCs. The Wilcoxon matched-pairs signed-ranks test was used to test the difference between the average impact of foreign exchange adjustments under SFAS No. 8 and the average impact of foreign exchange adjustments under SFAS No. 52. The Mann-Whitney two-sample and Kolmogorov-
Smirnov two-sample tests were also used to test the effects of SFAS No. 52 on volatility of reported earnings of MNCs, using the coefficient of variation as a measure of volatility.

The test firms consisted of a sample of 274 NYSE firms for which appropriate security return data was available on the CRSP tape. The early adopters sample consisted of 126 MNCs, and the late adopters sample consisted of 148 MNCs. A reduced sample of 227 MNC met the availability of security volume data requirements and were used in all the statistical tests for security volume. The control sample consisted of 204 domestic firms which met the sample selection criteria.

Five test periods were used in this study to examine the effects on security returns. They are: (1) 1980-1981, (2) 1981-1982, (3) 1982-1983, (4) 1983-1984, and (5) 1982-1984. The years 1980-1981 was considered the pre-SFAS No. 52 period; while the years 1981-1982, 1982-1983, 1983-1984, and 1982-1984 were considered the post-SFAS No. 52 periods. For testing the effects of the early adoption of SFAS No. 52, four test periods were used in this study: (1) 1981, (2) 1982, (3) 1983, and (4) 1984. The year 1981 was considered the pre-SFAS No. 52 while the years 1982, 1983, and 1984 were considered the post-SFAS No. 52 periods. A 19-week test period, which begins on October 5, 1981 and ends
on February 12, 1982, was selected for testing the effects on security volume.

**Test Results.**—The results and interpretation of these tests were presented and discussed in Chapter V. The results of the cross-sectional tests on security returns were quite clear. In the pre-SFAS No. 52 period, the CAR of the test and control firms were not different at the 5% level of significance. In all post-SFAS No. 52 periods, however, the CAR of test and control firms were significantly different at the 5% level. This implies that the null hypothesis of no effect on security returns due to SFAS No. 52 should be rejected. The results of the time-series tests showed a very strong difference between the CAR of 1980-1981 and 1981-1982 and between 1980-1981 and 1982-1983, and a fairly strong difference between the CAR of 1980-1981 and 1982-1984, but there was no difference between the CAR of 1980-1981 and 1983-1984 periods. Based on these results, the inference that follows is that the effect on MNCs' security returns was most pronounced in 1982 and 1983 and weaker in 1984. This effect occurred in the post-SFAS No. 52 and may be the result of its implementation.

The results of the cross-sectional tests on security volume showed that volume distributions of test and control groups were not significantly different at the 5% level in all test periods. Also, the results of the over-time tests
showed no difference between the cumulative average mean volume residuals of MNCs in the pre-SFAS No. 52 and the post-SFAS No. 52 period at the 5% level. This implies that the null hypothesis of no effect on security volume due to SFAS No. 52 cannot be rejected.

The results of the cross-sectional tests on the effects of the early adoption of SFAS No. 52 on security returns were insignificant for early and late adopters in the pre- and post-SFAS No. 52 periods. The results of the over-time comparisons of the CAR for early and late adopters in 1981 with the CAR in the three post-SFAS No. 52 periods were significant. The results of the cross-sectional comparisons imply that the additional information sent by the early adoption of SFAS did not cause the security market to react differently to early adopters as opposed to late adopters. The results of the cross-sectional tests on the effect of the early adoption of SFAS No. 52 on the security volume distributions of early and late adopters were significant in the pre- and post-SFAS No. 52 periods. These results do not allow one to conclude differences between the cumulative average mean volume residuals of the early and late adopters. However, the results of the over-time comparisons for early and late adopters were not significant, implying that the volume distributions of early and late adopters were not affected by the early implementation of SFAS No. 52.
In testing the impact of foreign exchange adjustments on reported earnings of MNCs, the results of the Wilcoxon test showed that the difference between the average impact of foreign exchange under SFAS No. 8 and SFAS No. 52 was significant at 1% level. However, the Mann-Whitney and Kolmogorov-Smirnov tests showed that SFAS No. 52 did not affect the volatility of reported earnings. This researcher feels that in testing for the effects of foreign exchange on reported earnings the results of the Mann-Whitney and Kolmogorov-Smirnov tests are more meaningful because volatility of reported earnings was measured by the coefficient of variation, which measures relative variability as opposed to absolute variability.

The results of tests on foreign operations showed that the impact of exchange adjustments on earnings was independent of the magnitude of foreign assets, foreign sales, and industry classification in the pre-SFAS No. 52 period. In the post-SFAS No. 52 period, however, the impact of exchange adjustments on earnings was significantly affected by the magnitude of foreign assets, foreign sales, and industry classification.

Limitations of the Study

This study has several limitations that should be considered and explained. Some of these limitations are
inherent and unavoidable because accounting and finance theories deal with social phenomena wherein cause and effect are difficult to observe. These limitations are as follows.

1. It is difficult to assess the direction and magnitude of bias associated with selecting the samples for this study. The first sample selection criterion ensured that the largest firms in the economy would be selected. Since these firms are large, old, and well established, they are associated with a larger flow of information than in the case for smaller firms in the economy; and their activities are very closely followed by the financial community. It is possible that reported results could be different if firms with different characteristics were selected.

2. Both the test and control samples reveal a representative cross-section of industry classifications. However, the differences in the magnitude of total assets and total sales between the test and control groups reflect the severe data constraints that are associated with attempting to match a test group of MNCs with a control group of domestic firms. As a result, the firms in the two groups should be viewed as a frequency match and not as being matched firm by firm.

Apart from any limitations associated with the sample selection, there are other possible sources of bias that arise out of the general design and nature of the issues under study. These limitations include the following:
1. The choice of the issuance date of SFAS No. 52 as a cut-off date for analyzing the effects of the policy change issue is open to question. However, the researcher believes that the issuance date signifies the FASB's final decision on the issue of foreign currency translation. The uncertainty created by the revision of the Exposure Draft of 1980 and the considerable objection to the Exposure Draft of 1981 were the reasons for not selecting their issuance dates as an appropriate intervention date.

2. Due to the lack of adequate disclosure, it was difficult to uncover specific foreign exchange transactions or management policy decisions that change the net asset or net liability exposure of an individual MNC during the different test periods.

3. The economic effect of changes in exchange rates on a particular MNC depends on a number of factors such as interest rates, foreign taxes, financial structure of the MNC, changes in inputs and outputs prices, and government controls on foreign exchange transfers. In testing the effects of SFAS No. 52 vis-a-vis SFAS No. 8, it would be ideal if the real effects of exchange rates on a MNC could be isolated in each test period. The problem is both the lack of a well-defined model that adequately links changes in exchange rates to the value of MNCs, and detailed firm-specific data. The assumption made in this study was that
changes in exchange rates are randomized for the test sample of MNCs. This assumption is open to question. However, the researcher believes that this assumption may not be unreasonable since each MNC usually deals in many foreign currencies and that the test sample consists of a large number of MNCs.

4. In testing the effects on volatility of reported earnings of SFAS No. 52 vis-a-vis SFAS No. 8, the Mann-Whitney and Kolmogorov-Smirnov tests were performed on the early adopters group only as a matter of convenience. It is possible that the reported results could be different if these two tests were performed on the test group as a whole.

5. A well-defined model is not available that can explain how investors process bits of information in making investment decisions.

Conclusions

The empirical findings from the tests of the hypotheses of this study lead to the following conclusions:

1. There have been significant effects on the security return distributions of MNCs in the post-SFAS No. 52 period. However, there have not been any statistically significant effects on security volume distributions of MNCs in the post-SFAS No. 52 period, although the volatility of volume trading for MNCs relative to domestic firms was higher in the pre- and post-SFAS No. 52 periods.
2. There have not been any statistically significant effects on security return distributions of the early adopters in the post-SFAS No. 52, implying that once the information effects of the accounting change are properly impounded into expectations of future earnings performance early adoption of SFAS No. 52 per se has no effect on security returns of MNCs. However, the results of the cross-sectional tests on the effects of the early adoption of SFAS No. 52 on security volume distribution of the early adopters were significant in the pre- and post-SFAS No. 52 period. These results do not allow one to conclude that differences between the volume distributions of the early and late adopters exist. The results of the longitudinal tests lead to the conclusion that the volume distributions of both the early and late adopters were not significantly affected in the post-SFAS No. 52.

3. Statistically significant effects on the volatility of reported earnings of MNCs in the post-SFAS No. 52 period were not observed. This suggests that SFAS No. 52 did not have any effect on the volatility of earnings of MNCs, even though unrealized translation adjustments are excluded from net income and are accumulated as a part of owners' equity.

4. There have not been any significant difference in the impact of exchange adjustments on reported earnings
among MNCs with different size of foreign sales, foreign assets, and industry classifications under SFAS No. 8.

Under SFAS No. 52, however, the impact of exchange adjustments on MNCs' earnings was significantly affected by the size of foreign sales, foreign assets, and industry classifications. This may imply that SFAS No. 52 affected the financial structure and hedging arrangements of MNCs. However, a more refined methodology and better data are expected to provide more definitive evidence on the relationship between the impact of exchange adjustments and the magnitude of foreign assets, foreign sales, and industry classification of MNCs.

Recommendations for Future Research

Promising avenues of investigation for future studies include the following:

1. The capital market reaction to SFAS No. 52 can be investigated using an event-type capital market research. The initial consideration of replacing SFAS No. 8, the release of the first Exposure Draft on SFAS No. 52, and the release of the second Exposure Draft are events associated with perceptible capital market effects. These are events where capital market agents may revise their probability assessment concerning future accounting rules.

2. The development of a model for measuring the short-run effects of foreign currency movements on the reported
earnings, financial structure, and economic values of MNCs operating in different geographical areas of the world, is an important topic for future research.

3. Research into the effects of varying the levels of stockholders' equity, long-term assets, and levels of depreciation probably would provide additional useful information about the SFAS No. 8 and SFAS No. 52 translation approaches. Different levels of stockholders' equity, long-term assets, and depreciation have some effect on the translation results of SFAS No. 8 because historical exchange rates were applied to long-term assets and capital accounts. Also, the capital accounts are translated at historical rates under SFAS No. 52.

4. The impact of current cost or price-level accounting on the translation results under SFAS No. 52 would be an appropriate research topic. The revised Exposure Draft of 1981 contained price level adjustment provisions to be applied prior to translation, and the International Accounting Standards Committee is considering the application of inflation adjustment of financial reports of foreign subsidiaries located in highly inflationary economies. The impact of current cost of price-level accounting on the translation results under SFAS No. 52 would be an appropriate research topic.
CHAPTER BIBLIOGRAPHY


APPENDIX A

LIST OF THE FIRMS IN THE TEST SAMPLE

AMF Inc.
AMP Inc.
Abbott Laboratories
Allegheny International
Allen Group Inc.
Allis-Chalmers Corporation
Alluminum Co. of America
Amex Inc.
Amerace Corporation
Amerada Hess Corporation
American Brands Inc.
American Can Company
American Cyanamid Company
American District Telegraph
American Home Products Corp.
American Hospital Supply
American Motors Corporation
American Standard Inc.
American Sterilizer Co.
Armstrong World Industry Inc.
Arvin Industries Inc.
Asarco Inc.
Atlantic Richfield Company
Avon Products Inc.
Bally Mfg. Corporation
Bandag Inc.
Bank of Virginia Company
Bankers Trust New York Corp.
Barnes Group Inc.
Barry Wright Corporation
Bausch & Lomb Inc.
Baxter Travenol Labs. Inc.
Bell & Howell Company
Bemis Co. Inc.
Beneficial Corporation
Big Three Corporation
Bristol Myers Company
Brown & Sharpe Mfg. Company
Brunswick Corporation
Brush Wellman Inc.
Burnaby Corporation
Burroughs Corporation
Buttes Gas & Oil Company
CBS Inc.
CPC International Inc.
CTS Corporation
Carnation Company
Caterpillar Tractor Company
Celanese Corporation
Champion International Corp.
Champion Spark Plugs Company
Chase Manhattan Corporation
Chesebrough-Pond's Inc.
Chicago Pneumatic Tool Co.
Chrysler Corporation
Cincinnati Milacron Inc.
City Investing Company
Cluett, Peabody & Co. Inc.
Coca Cola Company
Coleman Inc.
Colt Industries Inc.
Combustion Engineering Inc.
Conrac Corporation
Continental Corporation
Continental Group Inc.
Continental Illinois Corp.
Control Data Corporation
Cooper Industries Inc.
Cooper Laboratories
Corning Glass Works
Crane Company
Crompton & Knowles Corporation
Crown Cork & Seal Inc.
Crown Zellerbach Corporation
Cummins Engine Company Inc.
Dana Corporation
Dennison Mfg. Company
Dexter Corporation
Diamond Shamrock Corporation
Diebold Inc.
Donaldson Lufkin & Jenrette
Dover Corporation
Dow Chemical Company
Dravo Corporation
Du Pont E. T. De Nemours & Co.
Dun & Bradstreet Corporation
EG & G Inc.
Eaton Corporation
Emery Air Freight Corporation
Emhart Corporation
Ethyl Corporation
Exxon Corporation
Faberge Inc.
Federal Magna Corporation
Ferro Corporation
Flexi-Van Corporation
Foote Cone & Belding Comm.
Ford Motor Company
Foxboro Company
Fruehauf Corporation
GATX Corporation
General Dynamics Corporation
General Electric Company
General Motors Corporation
Genrad Inc.
Getty Oil Company
Gillette Company
Goodrich B. F. Company
Goodyear Tire & Rubber Co.
Gould Inc.
Gulf Resources & Chemical
Hanna Mining Company
Hercules Inc.
Hesston Corporation
High Voltage Engineering
Holiday Inns Inc.
Honeywell Inc.
IC Industries Inc.
Illinois Tool Works
Ingersoll Rand Company
Ingredient Technology Corp.
Interlake Inc.
Int'l. Business Machines Corp.
Int'l. Flavors & Fragrances
Int'l. Paper Company
Int'l. Tel. & Teleg. Corp.
Interpublic Group of Cos.
Johnson & Johnson
Kaiser Alum. & Chemical Corp.
Katy Industries Inc.
Kellogg Company
Kerr Mcgee Corporation
Kidde Inc.
Kimberly-Clark Corporation
Lamson & Sessions Company
Lenox Inc.
Libbey-Owners-Ford Company
Lilly Eli & Company
Lubrizol Corporation
Manville Corporation
Marathon Oil Company
Marsh & McLennan Cos.
McDonald's Corporation
McDonnell Douglas Corporation
McGraw Edison Company
McNeil Corporation
Mead Corporation
Merck & Co. Inc.
Merrill Lynch & Co. Inc.
Mesa Petroleum
Milton Bradley Company
Milton Roy Company
Minnesota Mining & Mfg. Co.
Mobil Corporation
Morgan J. P. & Co.
Morrison-Knudsen Inc.
Motorola Inc.
Murphy Oil Corporation
NCR Corporation
Nashua Corporation
National Can Corporation
National Distillers & Chemical
National Education Corporation
Newmont Mining Corporation
Norther Telecom Ltd.
Norton Company
Oak Industries Inc.
Occidental Petroleum Corp.
Ogden Corporation
Olin Corporation
Owens-Corning Fiberglas Corp.
Owens-Illinois Inc.
PPG Industries Inc.
Pacific Tin Cos.
Penny J. C. Inc.
Pennwals Corporation
Pennzoil Company
Pepsic Inc.
Pfizer Inc.
Phelps Dodge Corporation
Phibro Salomon Corporation
Philip Morris Inc.
Phillips Petroleum Company
Pitney-Bowes Inc.
Pittson Company
Polaroid Corporation
Pope & Talbot Inc.
Portec Inc.
RTE Corporation
Ramada Inns
Raytheon Company
Reichhold Chemicals Inc.
Revlon Inc.
Rexham Corporation
Reynolds R. J. Industries Inc.
Reynolds Metals Company
Robertshaw Controls Company
Robertson H. H. Company
Robins A. H. Company
Rohn & Haas Company
Rorer Group Inc.
SPS Technologies Inc.
Safeway Stores Inc.
Sargent-Welch Scientific Co.
Schering Plough Corporation
Scott Paper Company
Scovill Inc.
Sealed Power Corporation
Searle G. D. & Company
Sears, Roebuck & Company
Shell Oil Company
Sherwin-Williams Company
Signal Companies Inc.
Singer Company
Smith International Inc.
Smithkline Corporation
Square D Company
Standard Oil Company, Ind.
Stanley Works
Sterling Drug Inc.
Stewart Warner Corporation
Storage Technology Corp.
Sun Chemical Corporation
Superior Oil Company

Sybron Corporation
TRW Inc.
Teledyne Inc.
Tenneco Inc.
Texaco Inc.
Texas Instruments Inc.
Textron Inc.
Tiger International Inc.
Time Inc.
Timken Company
Tonka Corporation
Tracor Inc.
Transamerica Corporation
Travelers Corporation
Triangle Industries Inc.
UAL Inc.
Union Camp Corporation
Union Carbide Corporation
Uniroyal Inc.
United States Industries Inc.
United States Steel Corp.
Upjohn Company
VF Corporation
Van Dorn Company
Vendo Company
Viacom International
Vulcan Materials Company
Wackenhut Corporation
Warnaco Inc.
Warner-Lambert Company
Waste Management Inc.
Wendy's International Inc.
Western Pacific Industries
Westinghouse Electric Corp.
Weyerhaeuser Company
Williams Companies
Witco Chemical Corporation
Xerox Corporation
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