



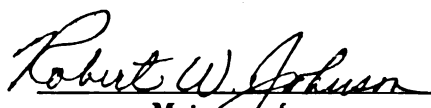
This is to certify that the
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THE FORECASTING PROPERTIES OF
INSIDERS' TRANSACTIONS

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ABSTRACT

THE FORECASTING PROPERTIES OF INSIDERS' TRANSACTIONS

by Donald L. Rogoff

This study is a test of the hypothesis that corporate insiders, through their purchases or sales of their own company's common stock, forecast its market price. If the hypothesis is valid, the insiders' transactions should tend to lead general public trading. Thus, given the psychological effect of market trends on expectations and spending patterns, its validity would have an economic significance. It was also the purpose of this study (1) to present information on the insiders' trading patterns and the price performance in each stock; and (2) to compare the performance of the insider-bought and insider-sold stocks.

There were insiders' transactions in 98 out of the 100 corporations drawn at random from the 1,065 common stocks listed on the New York Stock Exchange during 1957-1960. This sample yielded 1,507 monthly observations divided about equally between buying and selling. The insiders-monthly-activity index (hereafter, I.M.A. index) was the number of buyers minus the number of sellers in the stock, and the index of stock performance was the percentage of change in the SEC-300-stock-price index six months from the date of

the net buying or selling. Thus, the hypothesis tested whether inside-buying led a six-month advance greater than the general market movement and whether inside-selling led a six-month decline relative to the market.

The results of various statistical tests suggest that the hypothesis is valid, but that the correlation between insider transactions and the later market tendency of the stock is not inevitable. In other words, forecasting properties were erratic, and only certain kinds of transactions seemed to be dependable as predictors. Generally, insiders timed their purchases more accurately than they did their sales. A company's stock bought by two or more of its executives was more likely to perform better than the market, and also to outperform stock whose insiders had sold it. While more stocks sold by insiders declined than advanced, the ratio of successful predictions among them to the total number of forecasts was only slightly better than coin-tossing.

Despite strong evidence supporting the hypothesis that insiders forecast through their transactions the market price of their own company's common stock, the variation in performance is nevertheless large and the average performance resulted in such small financial gain that a policy of frequent turnover, with the associated trading costs, is

hardly warranted. The risk of making an incorrect prediction is probably never much less than one-third, even when the I.M.A. index has large values--i.e., differs considerably from zero. Although over-all correlations were not strong, there is a good indication that insider stock-transactions in companies with permissive policies toward the trading activities of their executives have positive predictive value. Some executive groups were extremely accurate in forecasting, and others were equally inaccurate, about two and a half very successful records for every equally unsuccessful one. It seems probable that a random selection of companies which encourage or tolerate insider buying and selling would yield a stronger relationship between transaction and eventual trend.

The evidence is consistent with the hypothesis that insiders have an advantage over outsiders when it comes to trading in their own company's stock. However, the performance of the stocks is too variable to make their apparent predictive property profitable to the speculator; it might well prove useful to people interested in aggregated economic values, nevertheless.

THE FORECASTING PROPERTIES
OF INSIDERS' TRANSACTIONS

by

Donald Lee Rogoff

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CHAPTER I

INTRODUCTION

The Hypothesis and its Significance

The literature contains studies of the ability of various groups to forecast stock prices, ranging from investment advisors and fire insurance companies to mutual funds. The evidence of successful forecasting by any of them, however, is very scanty. In fact, the evidence shows the reverse--that the "experts" do not in general successfully forecast stock prices.¹ As far as can be determined, there are no scholarly studies concerning the abilities of key corporate officials as expert forecasters.

This study is such an investigation, and proposes to

¹Statistical tests of the best individual records of the "experts" fail to demonstrate that they exhibited skill in investment. The average performance is unsuccessful compared either to the average random investment or to the market performance in general. And the least successful experts perform less well than can be reasonably attributed to chance. In essence, these were the results of the Cowles Commission for Research in Economics over three decades ago. See Alfred Cowles, 3rd., "Can Stock Market Forecasters Forecast?" Econometrica, I (1933), 309-324. More recently, the same general conclusion was suggested in A Study of Mutual Funds, A Report Prepared for the Securities and Exchange Commission by the Wharton School of Finance and Commerce (Washington: Government Printing Office, 1962), p. 17.

test the usefulness of reported stock transactions made by corporate officials--their purchase or sale of their own company's common stock--as a predictor of that stock's value in the time following the transaction. In other words, the hypothesis assumes that insiders forecast through their transactions the market-price of their own company's common stock. The corporate insider should, presumably, know more about his own company than the general public does. If this is the case, and the executive feels free to invest accordingly, following profit-maximizing goals, his operations should predict the stock's future value more accurately than general public trading does, and should tend to lead the general public trading.

A corollary of the hypothesis is that such insiders' stock transactions have an economic significance, at least in part, because of the importance of stock prices in our economy. Keynes, for example, observed that the level of prices in an organized stock market is influenced by speculative considerations having little or nothing to do with the real business outlook. He felt, however, that the level of the market does influence businessmen's expectations and thus their investment or capital-spending decisions; hence the economy is affected. More recently, Granger and Morgenstern suggested the psychological importance of the stock

market on the economy:

The stock market is an institution of considerable interest to the public at large and of real importance to students of a nation's economy. The variables which make up a stock market may not directly affect the mechanism of the economy but they certainly influence the psychological climate within which the economy works. To the extent to which the movements of the economy directly affect the stock market, a feedback situation occurs, although there are reasons to suspect that the strength of the feedback is not strong. The stock market produces large amounts of high quality data derived from well-understood variables. Despite these facts, the stock market has attracted surprisingly little study by professional economists or statisticians.²

Alfred Cowles's justification of his analysis of the forecasting efforts of professional agencies has a bearing on this point, as well:

It seemed a plausible assumption that if we could demonstrate the existence in individuals or organizations of the ability to foretell the elusive fluctuations, either of particular stocks, or of stocks in general, this might lead to the identification of economic theories or statistical practices whose soundness had been established by successful prediction.³

This investigation, like Cowles's, "is a means of testing the success of applied economics in the investment field."⁴ Possibly this empirical study may have significance (in

²C. W. J. Granger and Oskar Morgenstern, "Spectral Analysis of New York Market Prices," Kyklos, XVI (March, 1963), 1.

³Cowles, op. cit., p. 309.

⁴Ibid.

either method or finding) for the field of security analysis.⁵ Some students of speculative markets believe that the behavior of prices in them can, in part at least, be explained by the existence of some group or entity more knowledgeable of a stock's likely future in the market than the general participants. It would indeed be useful to find a specific group with this capacity.

The importance of insiders' stock transactions can be inferred from the large number of public traders who apparently follow their activities as a qualitative or technical indicator of a stock's value in making investment decisions.⁶ One of these reporting services bases its operations entirely on the premise that insiders at any time ought to know earlier than the general public if their company's stock is under- or over-valued.⁷ While the ob-

⁵An inductive approach to studying the behavior of stock prices has significance with respect to security analysis. See Benjamin Graham, "Towards a Science of Security Analysis," Financial Analysts Journal, VIII (August, 1952), 96-99.

⁶Articles regularly appear in the financial periodicals. For example, see Roger Bridwell, Barron's National Business and Financial Weekly; or Robert B. Shaw, Magazine of Wall Street, reports on insiders' stock activities published quarterly. Several investment services hint that *this* information is a useful investment guide. See The Value Line Investment Survey--Part I, "What Officers and Directors are Buying and Selling," published weekly.

⁷Bridwell and Company, "The Insider Report--It Pays

jectively written and documented investigations of the public's stock trading do not make blatant claims of the significance of insiders' transactions, they sometimes report the trading balances of this group as part of the "useful background of conflicting influences."⁸ This use of the data suggests that the findings of this study should have not only social but economic implications as well. Finally, because insider trading is an important market phenomenon, its significance as a market factor is well worth knowing.⁹

Approach

The focus in this study is on individual stock prices rather than on the aggregate level of the market. It seems more reasonable to assume some superior capacity of the insiders to recognize the over- or under-valuation of their own company on the market than it is to attribute to them a superior capacity to forecast general market trends. While corporate profits are interrelated, there is also

to Invest with the Insiders," Palo Alto, California; semi-monthly investment advice.

⁸Securities and Exchange Commission, Stock Trading on the New York Stock Exchange on September 3, 1946, Trading and Exchange Division (Washington: Government Printing Office, 1947), p. 3.

⁹More concrete evidence supporting this opinion is found in Exhibit 2-1, Chapter II.

evidence that they do not follow one consistent trend.¹⁰ Since earnings per share are an important factor in the price of a stock, there is no reason to expect one stock price cycle to coincide with another. In fact, stock prices of corporations do not follow one consistent trend, although the patterns they follow are not random either. In a study of the general economy it is reasonable to smooth out such price diversity. Until it is determined that there are predictable or unique patterns in the transactions of insiders, the possibility that aggregation might conceal such patterns makes it less hazardous to study the transactions separately within each company.

Scope

It is beyond the scope of this study to theorize about the personal motivations of individuals.¹¹ Nor will this study try to assess the impact of the insiders' transactions on the prices of the relevant stocks, although any correlation between the transactions and the stock prices

¹⁰Thor Hultgren, Cyclical Diversities in the Fortunes of Industrial Corporations, Occasional Paper no. 32 (New York: National Bureau of Economic Research, Inc., 1950), p. 11.

¹¹The behavioral assumptions will be explicitly stated in terms of the executives as an aggregated class in Chapter IV and subsequently reexamined in the light of the evidence.

revealed in the course of the study will be noted.¹²

The sample.--It was decided to limit observations to transactions in stocks listed on the New York Stock Exchange during 1957-1960. The common stocks of corporations listed on this exchange were given consecutive numbers 1 through 1065.¹³ Random tables were used and 100 common stocks were selected as the sample. The sample design was simple random sampling without replacement.¹⁴

The sampling fraction of approximately 1/10 appears to have resulted in an adequate sample. The 100 randomly

¹²The volume of the insiders' transactions was less than 1 per cent of the total volume in these stocks during the month and apparently had little, if any, influence on the price of these stocks. In a few instances the shares bought and sold by the executives represented between 1 and 2 per cent of the total purchases and sales; however, in the majority of cases, the size of this group's transactions represented less than 3/10 of 1 per cent.

¹³This listing fairly represents the population. Companies are continually being added or subtracted from the population over time. Mergers are the major cause of change. Over-all, however, these changes are relatively infrequent. The prepared list, as of July 1, 1957, is therefore adequate for our purpose.

¹⁴A few very large companies dominate the total market value of the stocks in the market. Therefore, a cluster sample design was considered so that General Motors, for example, would have had a greater chance of inclusion than one in 1065. If this study were concerned with predicting the level of the total market this might have been an advisable procedure to assure a representative sample. However, adequate testing of the hypothesis does not appear to require a cluster sample design.

drawn companies with common stock issues listed on the New York Stock Exchange are presumed to be typical of the more than 1000 listed companies, and include two of the thirty stocks in the Dow-Jones Industrial Average. The sample appears to be of sufficient size to allow confidence in the stability of its characteristics. The list of companies comprising the sample is provided in Appendix A.

Time span covered.--Insider transaction data were collected for the forty-eight months beginning January, 1957, and ending December, 1960. The total time span available for testing is from April, 1935 (the inception date of the SEC insider report publication) to the present. Since many significant changes in the economic structure could have occurred during this twenty-eight year period (as, for example, from the effects of World War II, the Korean War, increased tax rates, or the growth of stock option plans), it was decided to test recent history as being most likely to be useful for present-day purposes.

Organization of the Study

Chapters II and III will present empirical and legal background information on insider trading. In Chapter IV the hypothesis is analyzed and a method derived for testing its validity. Chapter V summarizes the aggregate results of

the statistical tests and analyzes the findings. It also examines the forecasting properties of the observed insiders' transactions, company by company. Do the insiders' transactions in certain companies consistently forecast reliably, while those in other companies as consistently fail to forecast? The hypothesis of the study includes a time relationship factor. Are insiders' transactions good predictors of their company's stock corrected for changes in the level of the market? Do insiders' transactions in a particular company's stock serve to predict market movements in those stocks?

The results suggest the need for greater selectivity and Chapter VI briefly examines the risk involved in selected transactions. These tests will use an appropriate average as the reference index for changes in the level of the stock market.

The conclusions and implications of this study are presented in Chapter VII, along with a summary of the recommendations drawn from this study.

In summary, the figures to be assembled in this study will present, apparently for the first time on a broad scale, information on the predictive value of insiders' transactions and the subsequent price behavior of the market prices of their own corporation's common stock.

CHAPTER II

PRIOR STATISTICAL STUDIES

Is there any evidence of predictive value in the reported transactions of corporate executives? A search through the literature reveals a dearth of theoretical-statistical studies using the well defined and readily available data. Their contributions are presented below.

Aggregate Dow-Jones Transactions Lead Their Average Price at Turning Points

Apparently the first statistical study investigating the usefulness of the reported insiders' transactions data relevant to the hypothesis that insiders forecast through their transactions the market price of their own company's stock was written by Robert S. Hamada.¹ In this study he investigated the usefulness of the turning points in an aggregate insiders' transactions series in an effort to forecast the cyclical turning points in the stock market as a

¹"An Analysis of Diffusion Indices of Insiders' Transactions," (unpublished Master's thesis, Massachusetts Institute of Technology, Cambridge, 1961).

whole. He aggregated the insiders' transactions in the thirty corporations comprising the Dow-Jones Industrial Average, and tested the forecasting correlation of that index with the Dow-Jones Industrial Average during the twenty-five year period 1936-1960. Hamada chose the diffusion index approach to aggregate the transactions of the individual series. Within this concept, he tested different bases for aggregating the transactions and different smoothing intervals.

Hamada found that insiders' transactions do correlate significantly with stock prices with a lead.² He based his conclusions on the general results and implications of the following: regression analysis, tests for randomness, turning-point conformity and timing consistency, Okun's appraisal test for leading indicators, and an objective investment decision rule.

The other findings of Hamada's study follow, paraphrased for brevity: (1) There is little difference in the forecasting properties of diffusion indices and indices computed from the first-difference of the aggregate index; (2) the performance of the aggregate index differed consistently

²Ibid., p. iii. As a second general conclusion, Hamada says, "The diffusion index concept provides another method for testing for correlation between two economic time variables."

from that of the other insiders' indices; it therefore cannot be called a good leading indicator; (3) computing indices on different bases from the same raw data makes little difference for forecasting; (4) smoothing an original index eliminates undesired irregular fluctuations that hinder the forecasting performance; (5) a structural change in the early 1950's improved the forecasting properties of the insiders' indices.³

This study, like Hamada's, tests the validity of the hypothesis that insiders' transactions have an inherent predictive value. The basic difference between the two is the method of testing for correlation and its rationale. Hamada looked at general market movements, while this study analyzes the company's stock price deflated for general market movements.⁴ Hamada did not compute the transactions series for each company in his sample before completing the aggregation. This study computes and tests the individual corporation series; in other words, it looks at the pattern of

³Ibid., pp. 173-174.

⁴Assuming that Hamada's method is appropriate and his conclusion of a significant leading correlation valid, the question arises whether the insiders are successfully predicting their own company's common stock, independent of the stock market, or forecasting the market as a whole, their stock investment in their own company following the general market? This conceptual difference between the two studies is expanded in Chapter IV.

trading activity in each corporation and tests its forecasting properties. Except for the regression analyses, our tests are quite different. Samples differ in size and character as a consequence of different sampling methods, and there are other differences which do not merit an exhaustive presentation.⁵

Selected Portfolio Outperforms
the Market

In 1962 William Parks, John Weiland, and I wrote a paper entitled "Common Stock Selection Design Using SEC Insider Reports: Analysis and Evaluation." The investment rule formulated and tested involved the investment each month of an equal amount of money in any stock listed during 1958 which met the discriminating criteria defining the "universe." The hypothesis was that stocks selected from the defined universe would, on the average, outperform the general market averages. The universe of common stocks consisted of those whose reported insiders' transactions met the following criteria:

1. Shares were purchased by three or more insiders during the same month, except that

⁵For example, our indices are constructed and weighted differently. Also, Hamada included purchases of shares on option, weighted equally with regular purchases, while the current study excludes this type of purchase transaction.

2. option and odd-lot purchases were excluded. Also excluded were an official's first purchase, defined as such when the quantity of shares purchased equalled his month-end balance of shares held.
3. Shares were not sold by any insider during the month.
4. Purchase of shares increased the holdings of at least two-thirds of the officials by 10 per cent or more.

Over the twelve-month period, forty-five common stocks in forty different corporations qualified for selection. The data were tested by comparing the average results of the selected portfolio with the performance of Moody's 125 Stock Average. Five holding periods were tested. Automatic selling rules were imposed at the subsequent time intervals of one, three, and six months and one and three years. The conclusions are outlined below.

The evidence tended to support the hypothesis that the selected portfolio would outperform the average diversified portfolio in a rising market. The six-month holding period, on the average, appeared to be optimal. Generally, the evidence suggested a short-term predictive value for the insiders' purchase transactions.

Both of these unpublished studies indicate that substantial gains would have accrued to a speculator using the insiders' transactions as a signal during the periods stud-

EXHIBIT 2-1

AVERAGE PERFORMANCE OF SELECTED STOCKS IN 1958 RELATIVE TO THE PERFORMANCE OF THE MOODY'S 125 STOCK AVERAGE

Action date	45 Selected Inside Stks.	Moody's 125 Stk. Index	Col. 1-Col. 2 S% Δ - I% Δ Average Success %	% Stocks Outgained Index Annualized
	100.00	100.00		
1 month later	104.06	103.15	.91	10.92
3 months later	112.60	108.39	4.21	16.84
6 months later	125.53	116.02	9.51	19.02
1 year later	134.20	126.10	8.10	8.10
3 years later	157.30	135.50	21.80	7.27

ied. In both studies the rules were followed automatically without regard to other information that might have been available to the speculator. While this procedure was useful in the attempt to isolate the value of the insiders' transactions as an investment tool, application need not be restricted to this practice. In other words, qualitative analysis and judgment coupled with the quantitative aspects might improve the value of this tool.

Tabulation of statistics

As noted in Chapter I, a search of the literature did uncover several non-theoretical statistical tabulations, although no statistical inferences had been published which relate to the hypothesis under consideration.

A research report by the New York Stock Exchange.--

The New York Stock Exchange undertook a detailed analysis to determine who the buyers and sellers were during the extraordinary upsurge of volume and the sharp price decline and recovery between May 28 and May 31, 1962.⁶ The activity of the executives of certain corporations was studied as well. This study provides a clue to the significance of this

⁶The Stock Market Under Stress: The Events of May 28, 29, and 31, 1962 (New York: The New York Stock Exchange, 1963).

segment of activity on the total market:

Although there was some unusual activity in a few individual issues, over-all it is unlikely that insiders had any significant influence on stock prices over the three days. The shares bought and sold by this group represented only 0.6 per cent of total purchases and sales. . . . Among all stocks listed on the Exchange, insiders purchased 388,000 shares and sold 70,000 shares during the last three business days in May. . . . Insiders were net buyers on all three days, with the heaviest buying occurring on Monday and Tuesday, May 28 and 29.⁷

How are these findings relevant to the present study? First, the trough formed during May 28-31, 1962 period, made it a good time to buy stocks for the short term, and the insiders were buying. This suggests that the insiders, in the aggregate, timed their transactions exceedingly well with respect to the market level. Second, the research department of the NYSE believed it appropriate to devise rules of inclusion and exclusion for collecting the data. Their method of collecting data can be seen in the following description:

Transactions in a particular common stock by the corporations' directors, officers . . ., and by any stockholder owning 10 per cent or more of the issue are referred to as "insider" trading. Included are transactions for accounts in which these stockholders are considered to have a beneficial interest, such as family member, trust, or personal holding company. For purposes of this report, "insider" trading does not include acquisitions through stock options, stock splits or stock dividends; nor disposition through

⁷Ibid., p. 38.

gifts or stock transfers. These items are excluded because they do not involve transactions on the New York Stock Exchange.⁸

While the literature does not reveal successful forecasting of individual stock prices in any statistically significant manner, it does reveal a consensus as to the appropriate statistical technique for measuring the relationship between variables in the stock market.

⁸Ibid., p. 37.

CHAPTER III

INSIDER TRADING--HISTORICAL

AND LEGAL BACKGROUND

This chapter will briefly review the background and legislation which brought insider trading data into existence. Next, some of the limitations are presented, followed by a brief discussion of the ethical aspects of insider trading.

Insider Trading Prior to 1933

The testimony at early congressional hearings during the investigation preceding the adoption of the Securities Exchange Act of 1934 suggests that there were numerous instances in which corporate officials benefited from their advance knowledge of factors significantly affecting the value of stocks.¹ During 1929 alone, there were over 100 cases in which corporate "insiders" participated in pools

¹Donald C. Cook and Meyer Feldman, "Insider Trading Under the Securities and Exchange Act," Harvard Law Review, LXVI (1953), 385. The factual background of abuse which led to the enactment of the Securities Exchange Act of 1934 is summarized in Section 2 of the Act.

trading in the stock of their own companies.² Having the benefit of advance information on significant changes in corporate financial policy, the insiders were able to reap large profits from stock-market activity at the expense of the stockholders. For example, Cook and Feldman reported:

In one of several glaring instances of abuse, the chairman of an executive committee participated with a director in a pool organized to trade in the stock of their company. When the pool was formed the company was paying no dividends. Shortly thereafter, however, they caused the company to declare a dividend, and they continued a policy of irregular dividends, payable at such strategic times that more than twenty-five per cent of what was paid was received by the pool. These dividends were paid in spite of the fact that the company's earnings were not sufficient to cover them and part of its surplus had to be diverted for that purpose.³

In the less flagrant violations of trust, the executives' testimony (and that of broker-dealers) suggests that profits from "sure-thing" speculation were regarded as one of the normal "emoluments" of office.

Such practices and attitudes led to the enactment of Section 16 of the Securities Exchange Act of 1934.

²Ibid., p. 386. The one hundred stocks subjected to pool operations were listed on the New York Stock Exchange. One pool in a seven-day period bought and sold almost 1,500,000 shares in Radio Corporation of America, at a net profit to the members of the pool of almost \$5 million.

³Ibid.

Section 16 of the Securities
Exchange Act of 1934

Section 16 is designed to curb the misuse of corporate information not available to the general public.⁴ The provisions of this section concern the stock market activity of insiders in "listed companies" (insiders are officers, directors, and large stockholders in these registered companies). The three-pronged approach to control of insider abuses may be described as (1) public disclosure; (2) purging of profits realized from short-term transactions; and (3) the prohibition of certain sales. The important section for purposes of this study is the disclosure provision, although all are discussed.

Public disclosure

Before discussing the disclosure provision, it is useful to clarify the term "equity security" as it is stipulated in the Act. In Section 3(a)(11), an "equity security" is defined as

. . . any stock or similar security; or any security convertible, with or without consideration, into such a security, or carrying any warrant or right to subscribe to or purchase such a security; or any such warrant or right; or any other security which the

⁴The Work of the Securities and Exchange Commission
(Washington: Government Printing Office, April, 1961), p. 6.

Commission shall deem to be of similar nature and consider necessary or appropriate, by such rules and regulations as it may prescribe in the public interest or for the protection of investors, to treat as an equity security.⁵

The courts' interpretation of the phrase "or similar security" is broad enough to include income bonds, voting debentures, and options of various sorts including puts, calls, spreads, and straddles.⁶ Thus, the possession of any of these privileges should be reported by persons falling within any category spelled out in Section 16(a):

Every person who is directly or indirectly the beneficial owner of more than ten per centum of any class of any equity security (other than exempted security) which is registered on a national securities exchange, or who is director or an officer of the issuer of such security, shall file, at the time of the registration of such security or within ten days after he becomes such beneficial owner, director, or officer, a statement with the exchange (and a duplicate original thereof with the Commission) of the amount of all equity securities of such issuer of which he is the beneficial owner, and within ten days after the close of each calendar month thereafter, if there had been any change in such ownership during such month, shall file with the exchange a statement indicating his ownership at the close of the calendar month and such changes in his ownership as have occurred during such calendar month.⁷

⁵Cook and Feldman, op. cit., p. 393, "citing" Section 3(a)(11).

⁶A "call" is an option to buy; a "put" is an option to sell; a "spread" and a "straddle" each involve a combination of a put and a call, thus giving the holder the choice of buying or selling on the date at the prices fixed.

⁷Securities and Exchange Act of 1934, Section 16(a).
The Public Utility Holding Company Act of 1935, Section

Subsection (a) is based upon the theory that disclosure of insiders' transactions would put a stop to the abusive transactions illustrated above. On the other hand, if the insiders do disclose their transactions, they are entitled like any other investor to anticipate future trends by "appropriate purchases and sales." What is meant by "appropriate purchases and sales" can be gleaned from a brief summary of other subsections.

Purging of profits

Subsection 16(b) provides that any profit realized from short-swing trading shall inure to the corporation. Hence, profits obtained by insiders from purchases and sales (or sales and purchases) of such equity securities within any six months' period may be recovered by the corporation or by any security holder on its behalf. This recovery right must be asserted in the appropriate United States District Court.

This sanction is based on the theory that if the possibility of profit were removed, short-swing trading by

17(b) and the Investment Company Act of 1940, Section 20 (f) were subsequently passed by Congress and signed by the President to regulate and reveal to the public the activities of insiders in these two specific areas of economic activity. These have similar provisions and are not detailed in the text above.

insiders would be discontinued. Since the courts utilize a life cost basis (instead of a fifo or average cost method) to compute the profit realized on transactions within six months, the possibility of profit on short-swing trades is lessened providing there is a plaintiff willing to assert recovery in the interests of the corporation.

Prohibition of certain sales

Subsections 16(c) and (d) continue the description of lawful and unlawful transactions for insiders. For example, Subsection (c) imposes an absolute prohibition upon certain sales, making it unlawful for insiders to sell their securities short or to engage in the practice of "selling against the box" (a system whereby a person sells securities and then borrows securities to meet his commitment, hoping to purchase the securities later at a lower price for delivery to his creditor).⁸

⁸"Selling against the box" is a short sale of borrowed stock in which the seller has a long position. While "selling against the box" may be prohibited, it can be argued that this would be harmless. Selling securities short which you do not own adds to the supply of shares and may subsequently result in a realized short-term profit for the insider. On the other hand, selling securities short in which you have a long position does not add to the supply of shares if the insider's alternative is to liquidate his long position. More important, it can be argued that the insider does not make a profit in selling against the box. If the market falls, his capital gain in the short position is cancelled by his capital loss in his long position.

This brief summary of the disclosure provision in the Act and its interplay with the other provisions has been presented as an introduction to the discussion of the general limitations in the data.

General Limitations in the Data

Much of Section 16 has been the subject of controversy, but there has been little opposition to the publicity requirements contained in Subsection (a).⁹ Some of the criticisms of this subsection are directed at its failure to require reports more often than once a month, and its limitation to the equity and convertible securities of listed companies. It has been suggested that, in view of the volatility of the securities markets, information a month or more old is not very useful to investors.¹⁰ The objection of limited applicability of the section is part of the broader objection to the irrationality of restricting the Exchange Act safeguards to investors in listed corporations, especially since listing is entirely voluntary. No legislation compels publicly held corporations that are not listed to offer these protections. The Commission has consistently

⁹Cook and Feldman, op. cit., p. 392.

¹⁰Ibid. For purposes of regulation, however, late reports are probably as useful as prompt ones.

protested against this discrimination against investors in over-the-counter market securities.¹¹

The SEC mentions in its Official Summary that publication of this information (on insiders' transactions) is in no sense a representation that the data as filed are correct, complete or genuine. Responsibility for accurate reports rests with the reporting individuals and not with the Commission or with any exchange.¹²

This raises the question of the meaningfulness of the published transactions data. Do key officials in large and widely held companies purposefully withhold or taint information on their transactions? This question is beyond the scope of the study; the hypothesis relates to the reported insiders' transactions, not the insiders' transactions by some other definition. If there are informed junior officials without executive titles who do not publicly disclose their transactions, the reported transactions are simply not completely comprehensive.¹³ Although the Commission asserts

¹¹Ibid. The SEC Special Market Study, released in April, 1963, again urged extension of the disclosure requirement.

¹²Securities and Exchange Commission, Official Summary of Security Transactions and Holdings, Washington 25, D. C., published monthly. This publication is hereafter referred to as the Official Summary.

¹³Another limitation is the possibility that real "insiders," if not overscrupulous, can place "dummies" on the board and trade on the basis of information supplied to them. See Benjamin Graham, David L. Dodd, and Sidney

that responsibility for accurate reports rests with the reporting officials, there are penalties for false reporting and the enforcement of the disclosure subsection is the responsibility of the Commission. One Chairman of the Commission has observed:

It is the Commission's policy to watch the reports closely and request a clarification whenever a discrepancy is noted. . . . Discrepancies are . . . discovered when, in accordance with the Commission proxy rules, the corporation shows in its proxy-soliciting material that the officer or director has a different number of shares from that which appears on his latest ownership reports.¹⁴

Some indication as to the validity of the data can be deduced from the number of amended and late reports filed with the Commission. Corrections reported average approximately one out of 700 reporting companies per month.

The Commission says that tardy reports are relatively infrequent. The data collected in this study confirm this. The relative frequency of late reports was observed to be approximately 4 per cent of the total number of transactions. Approximately 90 per cent of the late reports observed in this study are tardy less than two months, and no one has ever been prosecuted by the Commission solely for

Cottle, Security Analysis (New York: McGraw-Hill Book Company, Inc., 4th ed., 1962), p. 681.

¹⁴Cook and Feldman, op. cit., p. 407.

late reporting.¹⁵

For our purposes, therefore, it seems fair to assume that reported insiders' transactions fall within reasonable limits of accuracy.

Ethics and Policies: an Addendum

One of the designs of the Securities Exchange Act is to protect the investing public by maintaining fair and open markets for the purchase and sale of securities. This is accomplished through a measure of regulatory control upon certain organizations and individuals, and upon their reporting and trading practices. The reporting practices of listed companies or the trading practices of specialists, brokers, and dealers, for example, overshadow the practices of insiders in importance to the extent that they affect public policy. Nevertheless, the same broad purpose of "fairness" in the Act can likewise be ascribed to Section 16.

While it is not possible to judge the propriety of an action by inspecting the short- or long-term dimension within a buy-and-sell cycle, Section 16 seems to distinguish between short- and long-term trades. Section 16, in forcing

¹⁵Failure to file insider reports was the specific charge under which stock manipulator Alexander Guterma was arrested. However, the charges under which he was eventually jailed were broader.

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disclosure, in effect limits unfair trading to no oftener than twice a year. If the intent were to prevent unfair transactions, the Commission would not be denied the enforcement function under Subsection (b), and the recovery clause would not be limited to profits realized within a six-month period.

Enforcement lacking

Denying the enforcement function to an agency trained in this sometimes technical area sharply reduces the preventive powers of the subsection. If an alert but busy stockholder uncovers an illegal trade, the inconvenience of pursuit and the smallness of his pro rata interest in the recovery make it unattractive for him to take action. Thus, enforcement generally rests with the corporation as plaintiff, and litigation is the least attractive remedy. If litigation is started, the corporation is likely to seek settlement at a compromise amount.¹⁶ The corporation is equally unlikely to pursue an appeal of an adverse decision by a trial court.

On the other hand, even if the Commission were

¹⁶Cook and Feldman report instances where actions taken have neither been settled nor concluded by a judgment of the court. Instead the plaintiff has "voluntarily" discontinued the action.

empowered to investigate transactions that appear suspect, the more subtle forms of evading disclosure would make profit-detection difficult. For example, an insider with knowledge of the probable exchange ratio in a merger can evade disclosure by having a relative or friend act as the ostensible principal in the transactions.

A critical holding period of
six months

Not all short-term trades are improper; some may be explained by "special circumstances." However, in my opinion, speculations based on confidential information belonging to the corporation are unethical regardless of the length of the holding period. Use of information regarding significant changes in financial plans and policies (such as dividend changes, splits, liquidations, and mergers) for personal gain is a clear breach of the fiduciary relationship between the executive and the stockholder.

The Act is remiss in not authorizing recovery rights on transactions of this type that result in profits realized over more than six months. Executives are usually wealthy men, and present tax laws provide for a differential tax treatment between short- and long-term capital gains. Any improper application of inside information is most likely to result in long-term stock market profits, and hence not come

within the compass of the law.

Ethical behavior is, in the final analysis, a matter of individual character. Nevertheless, it would seem that directors might well set down a company policy for the guidance of its officers on this delicate matter of insider transactions. Such a policy should not discourage insider buying, but make it very clear that purchases made on the basis of information not available to other stockholders are unethical and will not be tolerated. Insider selling has obvious disadvantages for the company, and should probably be discouraged under all circumstances. A more conservative policy would perhaps require that all company executives refrain from stock trading of the company's own stock, on grounds that even though the official may not have information inaccessible to others, the others are likely to assume that he has. In other words, his position makes it impossible for him to behave as a private individual when it comes to trading his own company's stock, no matter how good his intentions.

This discussion of the ethics of insider trading is not irrelevant because, it will be remembered, the assumption that the executives "feel free" to invest following profit-maximizing goals was part of the reasoning that led to the formulation of the hypothesis that their transactions

have forecasting properties. If the insiders regard buying or selling as unethical, or if the corporation does not sanction insider trading, the empirical evidence in a random sample which includes such individuals and companies may fail to support the hypothesis, and we may erroneously reject it. Possibly the forecasting usefulness of the data depends upon filtering out the transactions of such insiders or companies. Certainly, if the observed trading patterns differ markedly among companies, one reasonable explanation may be the differences in corporate policies and attitudes that govern insider trading. Policies need not be written, and attitudes may be influenced by differences in tradition, corporate history, personal background, and the personality (including ethics and character) of the chairman.

To sum up, the historical and legal review in this chapter suggests that the insiders may in fact know more than the general public and, in addition, that they may be entitled, legally if not ethically, to anticipate future trends in the price of their stocks if they hold their purchases at least six months.

CHAPTER IV

THE HYPOTHESIS AND A METHOD OF INVESTIGATION

If insiders seek maximum profits, their transactions in their own company's shares may forecast the price of their company's common stock; if their transactions and the company's stock price are significantly correlated, the transactions are successfully forecasting the stock price. This is our hypothesis. The purpose of this chapter is to explain its rationale, describe a method of investigating it, and derive values for the variables used in testing it. A key problem, typical of all inductive studies, is one of definition and measurement of the variables which relate to the hypothesis being tested.

The Hypothesis

The hypothesis that insiders forecast through their transactions the market price of their own company's common stock assumes the standard profit maximization hypothesis under conditions of uncertainty. Assuming that executives follow maximum-profit goals does not necessarily mean that

all such transactions reveal the insider's assessment of his company's prospects. Other factors may motivate his behavior. A sale of stock need not mean that the seller believes the shares have attained their full value on the market, just as a purchase need not mean that the purchaser believes the shares are being sold to him at less than their full value.

Various possible motivations
behind a single transaction

Insider selling.--An insider with large holdings may sell part of his stock for estate planning or other tax purposes, even though he may believe the stock has further potential for appreciation. The market for the security may be thin, and he may decide to distribute his holdings gradually rather than make it necessary for his estate (if he dies) to liquidate a large block of stock at a later time. If an executive's holdings represent a major part of his assets, he may be moved by a desire for diversification. The insider may have been paid in stock rather than cash when he sold a business to or merged with the parent company. Perhaps the most common reason for a sale is the need of cash for taxes, consumption or some capital employment. He may need cash to exercise previously granted options to buy

shares under the current market price. Or, an insider may be dissatisfied with new management or with a changed policy of old management; having thus lost his feelings of "loyalty," he may be looking for a new company and a new career line where he can feel his talents are more greatly appreciated.

If transactions based on such suggested motives could be identified and eliminated, the remaining sales transactions might reflect the insiders' view that the shares in question are fully valued by the market. However, data do not reveal motivations behind a sale, and such "misleading" transactions cannot be excluded from the sample.

Insider buying.--Purchases by insiders are very often the exercise of options to buy shares at prices substantially below the current market. The exercise of such options is not a necessary indication that the insiders consider the shares a good value at the current market price. Fortunately, since these purchase transactions on option are reported separately, they can be excluded from the sample. However, there are other possible motives underlying purchases that cannot be thus identified and eliminated. For example, a purchase may reflect an insid-

er's desire to strengthen his position in relation to others who have a sizeable stock holding in the company. A proxy fight may be on the horizon. A purchase may be necessary to qualify an executive to serve on the board of directors. An official may increase his holdings to satisfy feelings of company loyalty, to achieve savings goals, or to accord with corporate mores despite a forecast of price decline or no forecast at all.

In sum, one limitation in the available data is the absence of an indication of the motive behind a particular sale or purchase. Generally speaking, a sale of stock by an insider appears to be subject to a greater variety of interpretations than a purchase at the market price. Nevertheless, since the limitation affects both types of transactions, no single transaction can be assumed to reflect the executive's assessment of his company's prospects.

The advantages of aggregating transactions in a company

The wide variety of possible motivations behind insider transactions, and the inability to deduce motivation from the available data, suggest the need for aggregating the transactions within each company. While the forecasting function may not be true for any single transaction, it is conjectured that the hypothesis may reasonably apply to the

transactions of executives as an aggregated class. If the non-forecasting transactions are assumed to be randomly distributed over time, and there seems to be no reason why they should not be, an aggregate measure of the transactions within a company during a month may reduce the influence of the "misleading" transactions. If so, such a measure may indicate the insiders' assessment of their company's prospects.

A positive relationship.--If an index of the insiders' transactions reveals their assessment of the company's prospects in the market, the forecasting hypothesis of a positive relationship between it and the stock's lagged index of price-performance may have some theoretical foundation. If the executives are all profit maximizers, the fact that they do not buy and sell in the same month can be "explained" in terms of their risk preference.

Risk preferences.--Executives may be reasonably expected to have different degrees of risk preference. When a number of executives take the same market action it may be presumed that they feel the risk of error is slight and they are therefore minimizing their risk in these particular market transactions. Thus, the greater the number of net buyers or net sellers, the greater is the risk aversion or

the more the risk is minimized (and the more important is the inside information). For example, three net buyers in a stock during the month may be assumed to summarize the activity of "risk minimizers," men willing to invest in the security at a time of a larger expected return because of the smaller variation.

In contrast, an aggregate company index of the insiders' transactions denoting one buyer or seller during a month might suggest the least risk aversion (or the largest risk preference). Other things being equal, it may be hypothesized that the insider's expectation is one of a larger variation. However, in the long run the expected returns may be smaller because of the larger variation.

Theoretically the expected returns (by the index number denoting the insiders' monthly activity) yield a positively sloped regression line. The nature of the "inside" information (and its utility to the executives) is beyond the defined limits of this investigation. For our purposes it is irrelevant whether or not the information on which the insiders presumably act is strictly confidential or discounted to some extent in the current price of the stock by those outsiders privy to this "confidential" information.

The Model

A linear model

Since the objective of the study is to find some simple explanation of the assumed relationship, a linear expression of lagged price performance per transactor has been selected.¹ Admittedly the real world is not this simple, but a linear model is useful (and workable) and should give a fair indication of what is going on. The model is used to examine the relationship between the insiders' transactions and the variation in the stock price from the date of the transactions to a date six months later.

Thus,

$$Y_{i,n} = A_i + B_i X_{i,n} + E_{i,n}$$

where $Y_{i,n}$ = the index of performance of stock i , beginning at month n , over a six-month interval. It is simply the percentage of change in a particular stock's price six months later less the percentage of change in the Securities and Exchange Commission's composite common stock index for the identical period.²

¹I did not experiment with a curvi-linear model.

$$^2Y_{i,n} = \left[\frac{S_{i, n+6} - S_{i,n}}{S_{i,n}} - \frac{I_{i,n+6} - I_{i,n}}{I_{i,n}} \right] 100$$

$X_{i,n}$ = the number of insiders buying, minus the number of insiders selling the particular stock during the month.³

A_i = a constant (the intercept), the average performance of stock i , over six-month intervals, if there are no insiders' transactions during a month.

B_i = the regression coefficient, a constant (the slope), the average percentage of change of stock i , over six-month intervals, for each insider trading during a month.

$E_{i,n}$ = the random factor producing the "unexplained" variation of stock i at month n over a six-month interval.

These notations may be simplified. For a given

where $S_{i,n}$ = the stock price of company i at month n

$I_{i,n}$ = the composite SEC Stock Price Index of 300 common stocks on the NYSE at month n .

n = month of observation, 1-48, 1957-1960; see Appendix B.

³The value of this variable is negative when the number of sellers is greater than the number of buyers. A zero value indicates an equal number of buyers and sellers, (usually zero less zero). In this study the term "net" means that we are netting buyers and sellers in a particular company during a given month. (We will not net transactors between months in a given company.)

company we assume $Y = A + BX + E$. We suppose E to have a distribution with a mean of zero so that the expected value of Y is given by $A + BX$. Since A may differ for each company, this term is not combined with the error term, E . The statement that insiders' transactions have no predictive value is, in terms of this model, equivalent to the hypothesis that B is equal to zero. Large values of the correlation coefficient between variables X and Y will tend to indicate that B is not zero.

While the correlation coefficients will be analyzed in detail, the slope (i.e., the regression coefficient) and the intercept will not be presented because of the lack of a useful economic interpretation to these parameters. The theoretical interpretations of these terms are discussed below.

The intercept and the slope.--The intercept is the estimate of the percentage that a particular stock will advance or decline, relative to the market as a whole, during a six-month period if there are no insiders' transactions. The slope is the estimate of the additional percentage change that the particular stock will undergo for each additional transactor. It is supposed that every company has a unique slope and intercept. Buyers give the total

estimate a positive boost, and net sellers provide a negative "kick" to the price change of the stock. For example, assume that the average slope and intercept for one corporation are 2 per cent and 3 per cent respectively and that there are three more purchasers than sellers (+3) on January 15, 1958. The estimate of the relative price change six months later is 11 per cent, i.e. 2 per cent plus 3 per cent times +3. Also, assume that the slope and intercept for a second corporation are -1 per cent and 1 per cent, and that there are three sellers net of buyers during a month. The estimate of this relative price change is -4 per cent. As a third hypothetical illustration, assume that the A and B terms are estimated to be -2 per cent and 10 per cent respectively for a third corporation and that there are zero transactors in January, 1958. Our oversimplified model would estimate the total relative change forecast by the zero transactors to be equal to the intercept, or -2 per cent in this case. In other words, interpretation of the slope and intercept in this model are estimates of relative price change unique to a particular corporation.

A company is generally either advancing or declining relative to the market, and the rate of change varies for individual companies. Companies differ in size, location, capital structure, and management, and the price fluctua-

tions in their stocks appear to reflect this, reacting differently to economic and psychological forces (after eliminating the influence of the market as a whole).⁴ It is not uncommon for a stock to rise in a bear market or to fall in a bull market. For example, during the year 1957 in which all comprehensive stock price indices declined, 801 listed issues declined in price, but 229 rose; and 7 of the 229 rose by 50 per cent or more.⁵ Observing this phenomenon, one economist stated:

The diversity of simultaneous price behavior of individual stocks is so wide as to render the action of any given stock price index unrepresentative of a variable, but usually substantial segment of the market.⁶

The fact of this heterogeneity in the data suggests that there is no reason to assume that a company's stock price will behave as the "average" stock. Therefore, there is no reason to assume that the A term in this model should equal zero. Indeed, on the basis of chance in individual cases the A term would not be equal to zero.

⁴While it may be reasonable to attempt to group companies according to their "risk class" in an aggregate study, this is beside the point for present purposes.

⁵Robert W. Storer, "A Critical Evaluation of Stock Market Indexes," American Statistical Association 1959 Proceedings: Business and Economics Section, p. 35, citing New York Stock Exchange Fact Book, 1958.

⁶Ibid.

In the aggregate data it is not possible to interpret the regression estimate with reference to the population. Since the composite tests for correlation did not include the relative performance of those stocks in the sample with zero transactors,⁷ the resulting intercept is not an estimate of the population. It is the average intercept of those stocks in the monthly sub-sample, and this group was not randomly selected. The sub-sample is composed of stocks in which there were insiders' transactions. Additional reasons for expecting that the intercept will differ from zero are (1) the chance phenomenon that a sample of 100 is not going to reflect the population of 1,065, (2) the performance of the sample is related to a population of 300 instead of the population of 1,065, and (3) the fact that the monthly sub-sample is not randomly selected.

On the other hand, if all the stocks in the sample were tested each month, and if the real world were actually duplicated by the hypothetical, then the intercept should

⁷Inferences cannot be statistically drawn with reference to the question: Does the absence of insiders' transactions in a given stock indicate that the company is an average performer? While an answer to this question would be interesting (and significant), it is not central to the thesis and, therefore, would not have justified the time and effort involved to compute the index of a stock's performance related to the case of zero buyers less sellers in a month. Therefore, the forty-eight months of inside-trading in 100 stocks yield 1,507, not 4,800, observations.

theoretically tend to be zero on the Y axis (except for a technical problem noted below).⁸ As noted earlier, the oversimplification of this model does not reduce its usefulness.

Six-month lead tested.--The rather arbitrary choice of a lead interval of six months is based upon a theory that if the hypothesized relationship is valid for six-month intervals, there is probably also some relationship for intervals of four, five, seven, and eight months. The determination of the most useful lead for various purposes is a matter for further study.

On the other hand, the available empirical evidence does suggest short-term rather than long-term forecasting properties. For example, during the period from June, 1954, through December, 1960, Hamada found the highest correlation for the index with a four-month lead rather than other lead-lag intervals tested, and the coefficient of correlation diminished as the lead was lengthened.⁹ For the full period 1936-1960, Hamada found that the median lead was six months

⁸Even in this case, however, the A term would tend towards the positive side of zero because of the slight bias introduced by the cumulative effect of arithmetically averaging successive plus and minus percentage changes.

⁹Hamada, "An Analysis of Diffusion Indices . . .," p. 120.

from the peak of the insiders' transactions index to the peak of the Dow-Jones Industrial Average: "The median lead is six months for peaks and five months for troughs, with the standard deviation of the lead in both cases less than its length."¹⁰ The earlier study summarized in Exhibit 2-1 found an eight-month interval preferable.¹¹ These varied conclusions do, at least, suggest a lead of less than twelve months as the optimum holding period.

SEC composite index.--The choice of the Securities and Exchange Commission's composite stock price index as the reference series for deflating the general market movements is based on its being an index of conceptually sound construction.¹² It has greater coverage than the more widely known Dow-Jones averages, and its weighting scheme is more consistent over time.¹³ The stocks selected at random

¹⁰Ibid., p. 143.

¹¹This study suggests a six-month interval, on the average, as the optimum holding period. However, six months in that study is the equivalent of eight months in the current study, due to the two-month lag from the action date of the speculator to the action date of the insiders.

¹²The Standard and Poor's indexes are of equal theoretical soundness for our purposes. Storer, loc. cit., pp. 27-43, and Discussion, pp. 49-50.

¹³Irwin Friend, F. E. Brown, Edward S. Herman, and Douglas Vickers, A Study of Mutual Funds, A Report Prepared for the Securities and Exchange Commission by the Wharton

represent a cross-section of the majority of industry classifications. However, since most averages of the market tend to move together anyway, the choice of one over the other does not appear to be crucial.

Rationale for deflating

Theoretical background.--The technique adopted is to analyze the executives' transactions and the subsequent share price of the company's common stock corrected for changes in the level of the stock market. It is an attempt to explain the interrelationships between the variables in the model.

The first step in the analysis is to divide the variables assumed to be significant into two broad classes: those which describe internal forces in the system, endogenous variables; and those which describe external or exogenous variables.¹⁴ While the particular level of a stock's price is presumed to be in part a function of the independent external forces acting on the market as a whole, the

School of Finance and Commerce (Washington: Government Printing Office, 1962), p. 293.

¹⁴The external forces assumed to be reflected in the market averages include such factors as interest rates, tax rates, inflation fears, etc., and other social, economic and political environmental considerations.

adjusted stock price deflated for this exogenous force is considered to be the dependent variable, internal to the system. This stock price, free of external market influence, is dependent on such factors as future earnings and dividends, which are themselves a function of profitability, growth, management, location, etc. of that particular company.

The model makes no attempt to explain changes in the market as a whole,¹⁵ but it does attempt to eliminate the effects of changes in the level of the market on the particular stock's price. The assumption is that the level of a stock's price is largely determined by forces independent of the internal forces presumed to be manifested earlier to the insiders. Thus, the model is constructed to consider the market as a whole as the exogenous factor, and the individual company's adjusted stock price (after eliminating the influence of the external forces) as the internal

¹⁵The question of whether or not insiders can forecast the market as a whole is not addressed in this study. If one does not remove the effect of the market on a particular company's stock price, the analysis relates to the predictive ability of the insiders' transactions with respect to two variables: the change in the market, and the change in the stock itself independent of the market change. If there is predictive ability in the transactions, the question remains: Which of the two variables is most significant? (Are the insiders market-wise or company-wise?) A later study might attempt to predict the variation of both variables.

dependent variable.

The model can be tested to see if a change in the pattern of insiders' transactions foreshadowed a change in the relative price of the company's stock. Thus, changes in the public's expectations of future earnings and dividends are not investigated directly, but are assumed to be reflected in the stock's adjusted price.

The statistical argument for deflating is implicit in this discussion. It is simply a means for studying the price variations of a stock which are caused by the factors resulting from the company's idiosyncrasies as they are "explained" by the transactions of the insiders: a relative price that is free of the variable forces within the market itself that result from changes in the company. In addition, since stock prices were generally rising substantially during 37 of the 53 months ending June, 1961, by deflating, we can expect an approximately equal number of cases of stocks to move up or down relative to the market. This will tend to simplify the presentation and facilitate the penny-tossing analogy for the non-statistician.¹⁶

¹⁶However, the applicability of the adopted statistical tests does not depend on the assumption that the true probability is one-half for a single success. Nor must one assume a normal distribution. While the frequency distribution of successes in a series of penny-tossing games may happen to have a normal distribution, this is not a pre-

The deflating process illustrated.--In this model an insider can incur a loss (that is, not make a profit) and still increase his wealth relative to the performance of the "average" alternative stock investment. For example, assume that Mr. Smith buys shares in his company at \$10 per share at a time when the market index reads 100. If the stock declines to \$9 per share and the market index declines to 60 six months later, Mr. Smith has not maximized profits. He has incurred a 10 per cent loss in capital value. However, despite his loss the situation tends to support the hypothesis. Mr. Smith's loss in capital value does not mean he failed to forecast the price of his company's stock successfully. On the contrary, his forecast on this score was accurate. His loss only indicates that he failed to forecast the movement of the stock market in general.

This case will serve to illustrate the experimental manipulations to be performed on the data:

	Month <u>n</u>	Six months later	Percentage of change
Stock price ($S_{i,n}$)	\$ 10	\$ 9	-10.0
Market index ($I_{i,n}$)	100	60	<u>-40.0</u>
Stock price percentage of change less the market index percentage of change for six months ($Y_{i,n}$)			<u>+30.0</u>

requisite of the tests used. Provided the assumptions of the tests are valid, the statistical treatment would be just as appropriate without deflating.

Relative to the market, this stock increased 30 per cent. It is not known what percentage of change Mr. Smith forecast, if any, but a relative increase of 30 per cent resulted. If Mr. Smith had sold instead of purchased, our method would say he had forecast in error, despite superior stock market timing due either to skill or chance.

This deflating process illustrates the dependent variable in this study. The hypothesis to be tested has no concern with whether or not insiders can forecast the market as a whole. The study is restricted to whether or not insiders forecast the movement of their own company's stock price, defined as the deflated or relative performance over six months.

A behavioral argument for deflating.--Another argument for deflating rests on a behavioral assumption. If insiders thought the market in general was going to rise, there would be no special reason to buy their own company's stock unless they thought it would perform notably better than the market. In view of the requirements for reporting insiders' transactions and the limitations on the nature of those transactions, it would seem more likely that executives who expected general business and stock price improvement would buy stock of other companies than their own.

Therefore, there would have to be a reason for buying their own stock strong enough to outweigh whatever disadvantages might accrue from the disclosure of such transactions to the public.

Rules for Collecting and Summarizing the Data

Insiders' transactions

The basic information on the insiders' transactions is published monthly in the Official Summary.¹⁷ This monthly summary lists the information given in the reports of the insiders filed during the month preceding its publication: information on the company, type of security traded, name of corporate official, his affiliation with the company, character of the transaction, nature of ownership, month of transaction, and month-end holdings of security traded.

In general, rules were necessary to sift out of the mass of data presented by the SEC only what could be used in formulating an aggregate company measure of the insiders' transactions. The criterion is implicit in the question: might this transaction in and of itself have a forecasting value, i.e. does it signify a conscious decision on the part

¹⁷Securities and Exchange Commission, Official Summary of Security Transactions and Holdings, Washington, D. C., published monthly.

of the insider relevant to the hypothesized over- or under-valuation of the particular stock at its current market price?

The rules adopted here for the collection of the transaction data are presented in Appendix C. Briefly, common stock acquired by insiders by the purchase of new right issues, by the exercise of conversion options attaching to other securities or through compensation or stock option plans have been excluded from insiders' market purchases. These procedures provide a clearer indication of insiders' open market transactions and are logically consistent with the hypothesized predictive value of these transactions and the subsequent short-run price behavior of the company's stock. The sales data, on the other hand, include the open market transactions of all shares acquired. Thus, while insider acquisitions may very well congenitally exceed dispositions, in this study the opposite may appear true because of the inclusion-exclusion rules for collecting the data. Another self-imposed rule which tends to reduce both purchases and sales is the exclusion of the disclosed off-the-board transactions in listed securities. Occasionally noted private transactions between parties were excluded.

The major category excluded from the purchase

transactions is the exercise of stock option grants. As noted earlier, such purchases were excluded because they represented bargain purchases at the date of exercise. On the other hand, key executives frequently sell a part of their holdings in order to finance the exercise of options.¹⁸ Thus, although it was thought to be appropriate to exclude option purchases, it was not feasible to exclude sales of option-acquired stock. Theoretically a sale of stock by an insider with a stock option, which is specifically transacted to provide the funds to meet the option price in order to take up the grant, should be excluded. Since these were not and could not be excluded, this particular limitation could quite possibly diminish the expected correlation.¹⁹

Late reports.--As noted in Chapter II, approximately one out of every twenty-five transactions is reported late. While 90 per cent of these are tardy by one or two months, the remaining 10 per cent are late by as much as two years. It was necessary to formulate a rule to handle this

¹⁸Henry Rothchild, "Financing Stock Purchases by Executives," Harvard Business Review (March-April, 1957), p. 136.

¹⁹Incidentally, a Commission rule exempts the sale of option-acquired stock, under certain conditions, from the scope of Subsection 16(b). This accounts for the alleged frequency of occurrence of this manner of financing option purchases.

limitation in the data, and it was decided that the late reports would be included in their proper transaction month as if they had been reported on time. This procedure has the effect of improving the accuracy of the reported data. These current omissions, transactions known only by subsequent report, reduce the data available to the outside forecaster. This would be an important disadvantage if one wanted to beat the market, but since beating the market is not the purpose of this study, the late reports are included in the data tested.²⁰

Selected index of transactions.--While there are numerous methods for deriving an index number for the insiders' transactions variable, the selected measure is based on the number of transactors. It is simply a monthly summary of the number of insiders buying, less the number of insiders selling the stock. A transactor who increases his holdings on balance during the month is assigned a weight of plus one. A minus one is assigned to each transactor who reduces his holdings on balance during the month. The sum of these assigned numbers represents the value assigned to

²⁰The reader interested in stock market speculation should keep in mind that, in addition to late reports, there is a lag in gathering and publishing the data of approximately one and a half months.

the insiders' transactions variable for a certain company during a given month. For example, an observation with a weight of plus three tells the reader that there were three purchasers more than there were sellers of the stock during the month. A monthly observation weighted minus three indicates that there were three more sellers than there were purchasers. A zero weight indicates that the number of buyers was equal to the number of sellers. In some instances a zero weight summarizes activity of an equal number of buyers and sellers; however, in the vast majority of cases it indicates no activity and, as previously noted, the monthly observations weighted zero were not tested. Among the observations tested, the sign of the index number indicates the direction of the forecast (in the model) and the number, itself, expresses the relative importance of this particular forecast of advance or decline in the company during the period studied.

This technique weights each insider's monthly transactions equally, and weights each monthly observation in the time series of the company according to the number of buyers less the number of sellers. Thus, each monthly observation in a particular company may have a positive, zero or negative value. And the forty-eight monthly values in a company's time series may reveal a consistent, cyclical, or

irregular trend or pattern.

Since insiders have various motives, the inference of profit maximization is more likely the larger the number of observed transactors who behave alike. The greater the number of net buyers or net sellers in any given month, the greater the confidence one may presumably place on the magnitude of the forecast (but unknown) percentage change of advance or decline, respectively. Another useful economic interpretation, drawn from the utility maximization hypothesis, is that the inference that action taken on the basis of inside information carries relatively little risk, the larger the number of net buyers or net sellers. For example, the greater the proportion of buyers over sellers, the more favorable was the information available to the insiders and the more likely this stock to advance. Similarly, the greater the number of net sellers, the more significant was the adverse information available to the insiders and the more likely the stock to drop in price. An accurate interpretation of the available data is impossible; nevertheless, the adopted technique is simple to compute, and the resulting index numbers are easily understood (in terms of the model).

Evaluation of index of transactions.--Deriving a

value for the transactions variable presents the problem of interpreting the importance a transaction had in the mind of the transactor, and the problem of finding a common denominator by which separate transactions can be compiled into one number. Does the purchase of 1,000 shares by one official have ten times the forecasting significance as does a purchase of 100 shares by another? Or, is it ten times as important only if each executive originally held the same number of shares? Purchases or sales of dissimilar quantities may be weighted equally or in accordance with size or some other criterion. Because individual executives differ from one another in terms of financial resources and risk preferences (data which are not known), it was decided to give each purchaser or seller the same weight, regardless of the size of the transaction or its relationship to the insider's holdings a month earlier.

Consequently, there could be a situation where five insiders purchase a total of 1,000 shares while one official sells a total of 5,000 shares. While the value assigned to these insiders' transactions is plus four, the officers are actually selling the stock, on balance, during the month. The executive who sells 5,000 shares may consider this an insignificant item in his total wealth, whereas there are five executives presumably "voting" that the stock price

will advance; there is no knowledge, really, as to the importance of these transactions to the wealth-income position of the transactors.

While a \$3,000 transaction is weighted equally with a \$100,000 transaction, the adopted method does not equally weight an insider's transaction of less than \$3,000. The Securities and Exchange Commission's rules for reporting generally exempt small transactions of less than \$3,000 from the disclosure requirement.²¹

The weighting technique does have limitations. The index number of buyers less sellers gives the same weight to a transaction which reduces an insider's holdings by 10 per cent as it does to another's transactions which reduce his holdings by 100 per cent. If the selling insider did, in fact, forecast a relative price decline and felt it was imminent, he would probably feel a greater urgency and sell a larger quantity of his personal holdings. However, if these two transactions were the only two in a particular company occurring in different months, our system would weight the forecasts equally. Or, the executive who felt strongly that the price was going to advance might buy 500 shares, whereas if he were less confident that the price would rise, he

²¹See Appendix D, SEC Rule 16a-9.

might buy only 100 shares. On the other hand, all the bases for index construction that were considered seem to ignore the possibility that to a junior officer 100 shares may be more important (telling) in terms of his personal wealth than a transaction of 100 shares would be to a director or senior officer.

Stock price and stock market values

The values of both the stock prices, $S_{i,n}$, and the stock market averages, $I_{i,n}$, are one month apart and the tested intervals of a stock's relative performance, $Y_{i,n}$, are approximately six months apart. A mid-month Friday is the point in time at which the closing stock price and market average are observed and recorded. The insiders' transactions are assumed to be made at that moment and price. Actually, the transactions are made throughout each month at varying prices, but the exact date of a transaction was not given in the Official Summary for the years tested.²² Averaging the daily prices or the monthly high and low would have increased the number of calculations. The alternative of computing an average price for the month was discarded in

²²In 1963 the Commission resumed the practice of reporting the day of each monthly transaction and thus remedied this particular limitation.

favor of a specific price at a specific point in time. Since this was the method of recording the prices of the stocks, it was the appropriate method for recording the readings of the SEC Composite Index.

Adjusting stock prices for stock dividends, splits, etc.--The stock prices were adjusted to make proper corrections to offset the effect of changes in the number of shares outstanding as a result of the issue of rights, stock dividends, splits, etc. For example, forty-eight of the issues in the sample had stock dividends during the four and one-half years ending June 30, 1961. The ex-dividend dates were determined, and appropriate adjustments in the price of the stock were calculated.

Appendix E is provided to illustrate and thereby summarize the mechanics of extracting values from the raw data. Aldens Inc., the first company in the sample, is the example used.

Summary

A method of investigating the correlations between the insiders' transactions and the price of the company's stock has been described. While there are other and possibly better techniques, the one developed for this study is believed to be both sound and workable. This model, summar-

ized in notation form earlier, provides the plan for the study. Since the transactions are reported by month, the values for this variable are monthly. The various tests employed will be limited to a leading time of six months. In general, positive values in the insiders' transactions index summarize the intensity of the insiders' net buying, and are interpreted as a forecast of an increase in the price of a stock that is relatively greater than the general market movement. Similarly, negative values summarize net selling and a forecast of decline in a stock's price relative to the market as a whole.

The statistical groundwork and collection procedures have been summarized in the text and illustrated in the appendix. The study's focus is on the company and its monthly transactions. Since there are 100 companies and forty-eight months during 1957-1960 being considered, there is a maximum possible number of 4,800 observations. However, the sample actually consists of ninety-eight companies and 1,507 observations, because the executives in two of the 100 companies never traded, and the executives in the other companies executed transactions about once every three months. This average conceals, however, the diversity of the activity, which ranged from one to thirty-nine observations per company during the forty-eight month period.

Each observation has a pair of hand-calculated values: the index of the insiders' transactions and the index of the stock's performance six months later. These two values, along with the identifying company and month number, were punched on 1,507 machine tabulated cards for further detailed analysis.²³

²³The summarizing statistics listed below were calculated on a Control Data Corporation 160-A computer. A program was written to calculate sums, sums of squares and cross products, means, standard deviations, variances, covariances, correlation and regression coefficients between the two variables.

CHAPTER V

ANALYSIS OF STATISTICAL RESULTS

This chapter will test the thesis of this study: whether the corporate insider forecasts through his transactions the future market price of his company's stock, independent of the market trend. If his stock purchases are followed in six months by a better-than-average market price and his sales of stock by a worse-than-average market price, we can conclude that the insider's transactions do provide forecasts.

This chapter is organized into two major sections. The first examines the magnitude and direction of the lagged-price performance. The second section examines the direction of change without regard to extent of percentage of change. Each section is generally organized with the aggregate results (usually forty-eight monthly composites) preceding the company results over time. The company results are usually summarized in the text and detailed in the appendixes. The essential techniques of description are correlations and mean-performance statistics in the first section and binomial probabilities in the second. Tests are

run on the sign of the correlations and the difference between sampled means. Chi-square goodness-of-fit tests are run on the sampling distributions in the final section. The sub-hypotheses proposed in the segments of each section are generally stated in the introductory remarks to that sub-section.

Forecasting the Magnitude of Change

The hypothesis assumed in the linear model (see Chap. IV) states that the larger the net number of transactors, the larger the rate of advance or decline of the stock after six months, relative to the market. Correlation analysis is first employed to test this hypothesis.¹ Positive correlation coefficients support the validity of the hypothesis. Therefore, the larger the coefficient, the stronger the linear relationship between the transactions and performance indices.

The data are first grouped by month of observation, and the correlation coefficient is computed for each group. Thus, during 1957-1960, there are forty-eight correlation

¹The product moment correlation coefficient will hereafter be referred to as the correlation. It is calculated by using a linear regression analysis of the stock performance index on the insiders' transactions index. Because of the six-month overlap among some of the observations in the company data, these correlations through time cannot be statistically tested.

coefficients between the two indices based on 1,507 observations. These results, ranked by size of correlation, are shown in Exhibit 5-1. If the forty-eight correlation coefficients seem to yield the same result consistently, it will be substantial evidence tending to confirm or deny the hypothesis that insiders forecast through their transactions the market price of their own company's common stock six months later.

Support for the forecasting hypothesis

The evidence suggests that, in general, the correlation is probably positive, but it does not appear to be large. The median correlation and the average correlation were both found to be +0.132.

While the linear relationship appears to be weak, the frequency distribution of the forty-eight results in Exhibit 5-2 is striking. Since forty of the forty-eight correlation coefficients have positive signs, the forecasting hypothesis is supported and the slope of the regression coefficient is very likely positive.² The statement that insiders' transactions have no predictive value is, in terms of this model, equivalent to the hypothesis that the proba-

²The average regression coefficient for the sample was found to be +1.2 per cent per transactor.

EXHIBIT 5-1

MONTHLY CORRELATION RESULTS BETWEEN
 PERFORMANCE AND CORPORATE INSIDERS' TRANSACTIONS
 INDICES DURING 1957-1960, RANKED BY SIZE

Number of Observations per Month	Correlation of Net Buying and Net Selling Observations and the Relative Price Performance Six Months Later
22	+.5016
30	+.4923
29	+.4722
31	+.4422
33	+.3352
37	+.2999
31	+.2872
30	+.2812
36	+.2735
35	+.2597
36	+.2546
30	+.2420
34	+.2368
40	+.2237
44	+.2108
29	+.1979
33	+.1766
32	+.1637
36	+.1621
28	+.1438
33	+.1436
29	+.1387
32	+.1348
34	+.1346
30	+.1290
32	+.1242
32	+.1150

EXHIBIT 5-1--Continued

Number of Observations per Month	Correlation of Net Buying and Net Selling Observations and the Relative Price Performance Six Months Later
37	+.1077
36	+.1031
27	+.0977
28	+.0680
37	+.0615
35	+.0518
31	+.0502
43	+.0491
36	+.0384
21	+.0298
31	+.0280
23	+.0234
34	+.0024
27	-.0142
23	-.0147
23	-.0596
25	-.0959
31	-.1272
31	-.1466
31	-.2293
19	-.2806
Total	1507

EXHIBIT 5-2

FREQUENCY DISTRIBUTION OF 48 MONTHLY CORRELATIONS
BETWEEN INSIDERS' TRANSACTIONS AND
RELATIVE STOCK PRICE PERFORMANCE
LAGGED SIX MONTHS

Range of Correlation Coefficients	Frequency
Between +.500 and +.599	1
Between +.400 and +.499	3
Between +.300 and +.399	1
Between +.200 and +.299	10
Between +.100 and +.199	14
Between .000 and +.099	11
Between -.100 and -.001	4
Between -.200 and -.101	2
Between -.300 and -.201	2
Total	48

bility of obtaining a positive correlation is equal to the probability of obtaining a negative correlation. This hypothesis of randomness can be rejected at the .00001 level of confidence.³ On the other hand, a linear model results in variable correlations and a weak correlation on the average.

Variation in monthly correlations.--Only six of the 48 monthly tests, considered individually, yielded statistically significant results.⁴ In Exhibit 5-3 the six significant correlations are listed along with six negative correlations as a further indication of the range. The dates of the net buying and net selling observations are also provided. The reasons for the curiously large variation in the correlations now need to be considered.

One possible explanation is that the general behavior of the market was a factor, despite efforts to eliminate its influence. In an attempt to discern a pattern in the correlations, Exhibit 5-4 is presented. However, inspection shows that there is no consistent pattern in the correlations

³The binomial test with respect to the sign of the correlation coefficients is provided in Appendix F.

⁴Statements of statistical significance of correlation coefficients computed from linear approximations are based on Table V-A of R. A. Fisher, Statistical Methods for Research Workers as reproduced in D. B. Owen, Handbook of Statistical Tables (Reading, Massachusetts: Addison-Wesley Publishing Company, Inc., 1962), p. 510.

EXHIBIT 5-3

SIX LARGEST AND SIX SMALLEST MONTHLY CORRELATIONS

Month and Year of Net Buying and Net Selling Observations	Observa- tions	Correla- tion	Significance Level
Mar., 1957	22	+.5016	Yes at .01
July, 1960	30	+.4923	Yes at .005
Apr., 1958	29	+.4722	Yes at .01
Dec., 1958	31	+.4422	Yes at .01
Aug., 1957	33	+.3352	Yes at .05
June, 1960	37	+.2999	Yes at .05
Aug., 1958	23	-.0596	No at .05
July, 1958	25	-.0959	No at .05
Sep., 1958	31	-.1272	No at .05
Oct., 1959	31	-.1466	No at .05
Oct., 1958	31	-.2293	No at .05
Oct., 1960	19	-.2806	No at .05

EXHIBIT 5-4

THREE CORRELATION COEFFICIENTS PER MONTH BETWEEN INSIDERS' TRANSACTIONS
AND THE RELATIVE STOCK PRICE LAGGED SIX MONTHS AND
A BACKGROUND OF THE GENERAL MARKET MOVEMENT

Month and Year of Observations	SEC Composite Index (1957-59 = 100)		Correlation of Insiders' Transactions and the Relative Stock Price Performance Lagged Six Months		
	Direction	Level	Net Buying	Net Selling	All net Observations
Jan., 1957		88.9	-.0244	+.2134	+.0502
Feb.	-	87.3	-.1541	-.3252	+.1436
Mar.	+	88.7	+.0688	+.0513	+.5016
Apr.	+	92.3	-.0234	+.0004	+.1766
May	+	96.0	+.0330	-.2261	+.1150
June	+	97.9	+.4273	-.0817	+.2420
July	+	99.8	+.0665	-.3026	-.0147
Aug.	-	92.9	+.0196	-.0736	+.3352
Sep.	-	90.8	+.0365	-.1812	+.2597
Oct.	-	81.1	+.5110	-.1920	+.2735
Nov.	+	81.4	+.1393	-.0807	+.0615
Dec.	+	82.0	+.0834	+.1967	+.2108
Jan., 1958	+	82.9	+.0078	+.1457	+.0517
Feb.	+	83.5	-.0844	+.6829	+.0977

EXHIBIT 5-4--Continued

Month and Year of Observations	SEC Composite Index (1957-59 = 100)		Correlation of Insiders' Transactions and the Relative Stock Price Performance Lagged Six Months		
	Direction	Level	Net Buying	Net Selling	All Net Observations
Mar., 1958	+	85.3	-.1402	+.1676	+.0383
Apr.	+	86.0	+.2392	-.3320	+.4722
May	+	87.2	N.A.	-.1402	+.1290
June	+	90.6	+.1002	-.0721	+.0024
July	+	91.7	-.5238	+.3853	-.0959
Aug.	+	95.3	+.0085	-.1168	-.0596
Sep.	+	97.6	-.0064	-.1593	-.1272
Oct.	+	103.9	-.3803	+.0063	-.2292
Nov.	+	107.2	-.0958	+.3318	+.1348
Dec.	+	107.5	+.0432	+.6127	+.4422
Jan., 1959	+	112.8	-.2306	+.3423	+.2368
Feb.	-	110.0	+.2540	+.2352	+.1621
Mar.	+	114.7	-.3014	+.3351	+.0280
Apr.	+	117.5	-.2843	+.2546	+.1031
May	+	117.9	+.1592	+.2603	+.1387
June	-	116.3	-.0174	-.1191	+.1346
July	+	120.3	+.2842	+.3780	+.1637
Aug.	+	120.4	+.4053	+.0101	+.0235
Sep.	-	114.1	+.0852	+.2540	+.1438
Oct.	+	116.8	+.1431	-.2016	-.1466
Nov.	-	115.7	+.0932	+.1015	+.0680

EXHIBIT 5-4--Continued

Month and Year Of Observations	SEC Composite Index (1957-59 = 100)		Correlation of Insiders' Transactions and the Relative Stock Price Performance Lagged Six Months		
	Direction	Level	Net Buying	Net Selling	All Net Observations
Dec., 1959	+	120.5	+ .5739	-.0878	+ .2237
Jan., 1960	-	118.9	-.1497	+ .1181	+ .1077
Feb.	-	113.1	-.2359	-.0614	+ .0491
Mar.	-	112.2	+ .2390	+ .0760	+ .2872
Apr.	+	115.2	-.0036	-.0907	+ .1242
May	-	112.9	+ .0526	+ .1974	+ .2812
June	+	117.2	-.0785	+ .3492	+ .2999
July	-	114.3	+ .2447	+ .6046	+ .4923
Aug.	+	115.5	+ .5437	+ .1496	+ .1979
Sep.	-	112.0	-.2044	+ .4663	-.0142
Oct.	-	111.3	-.0495	+ .5420	-.2806
Nov.	+	112.8	-.4746	+ .3697	+ .0299
Dec.	+	115.8	+ .2293	-.0632	+ .2546
Jan., 1961	+	120.5			
Feb.	+	125.4			
Mar.	+	130.4			
Apr.	+	134.2			
May	+	134.5			
June	-	131.9			

N.A. = Not available due to zero variation in the net number of buyers over sellers.
All cases were one-net-buyer.

as the market advanced or declined.

Another possibility is that either the net buying observations or the net selling observations, but not both, are related to the stock's performance, and that the other dilutes the total correlation. For example, 31 of the 1,507 observations of executive trading occurred in January, 1957, and correlated with their stock's price performance at $+0.0502$. The observations in each month were dichotomized into net buying and net selling observations and separately correlated (hereafter called sub-correlations). For example, out of the 31 observations in January, 1957, 19 were net buying observations and 12 were net selling observations. Correlation of the 19 net buying observations, with their stock's performance (-0.0244) does not support the hypothesis, while correlation of the 12 net selling observations ($+0.2134$) does tend to support the sub-hypothesis that insiders' selling transactions forecast a relative decline of their company's stock price. However, this and other patterns of the two sub-correlations are not consistent, and do not help explain the variation in the 48 monthly correlations between the insiders' transactions and their company's stock price in the last column of Exhibit 5-4.

The preponderance of positive correlations between net buying and the rate of advance, and net selling and the

rate of decline, seems to indicate a real relationship, although for most months there is not enough evidence to demonstrate it statistically. If we ignore this limitation (among the sub-correlations), one pattern does emerge when we compare the proportion of positive signs to the total months in each sub-correlation column and in the total correlation column. Only 27 out of the 47 correlations between net buying and performance, and 29 out of the 48 correlations between net selling and performance, were positive. Comparing these two frequencies with the 40 positive correlations out of the 48 monthly tests suggests that an alternative hypothesis might be more accurate--the hypothesis that insiders forecast through their transactions the direction but not the magnitude of their company's stock price.⁵ This hypothesis is tested in the other major section of this chapter. However, the direction-only-model also furnishes only a weak relationship for most companies.

Variations among performance of insiders, by com-

⁵For example, if the true correlations for the population are +0.05, +0.05, and +0.25 between net buying, net selling, and net buying and selling, respectively, and performance, this would suggest the hypothesis that insiders forecast through their transactions the direction but not the magnitude of their company's stock price. In other words, the correlation (+0.25) would seem to depend more on the difference in performance of insider-bought stock compared with insider-sold stock rather than the forecasting properties of either the net number of buyers or sellers.

pany.--The most plausible explanation for both the variation in the 48 monthly correlations and the concentration of four of the six negative correlations in the July to October, 1958 period is that the executives in some companies successfully forecast their company's stock price and those in other companies do not.⁶ This variation by company has its influence on the monthly correlations, depending on the distribution by month and year of the trading activity in the successful and unsuccessful company series.

The performance of the insiders' transactions in companies with more than five observations over the 48 months are ranked by correlation coefficient in Appendix G. This ranking attempts to compare the degree of forecasting success of the companies' executives in terms of the hypothesis of a linear relationship between monthly activity and price performance. The frequency distribution of these ranked correlation coefficients is summarized in Exhibit 5-5.

⁶Still another question is raised by the non-random-frequency of three negative correlations occurring in three of the four October tests. Do the insiders' transactions reveal a seasonal pattern? While the empirical evidence in this study suggests a negative answer for the sample as a whole, the possibility of a seasonal influence in the transactions in some companies does exist. For example, a personal letter from an executive of a listed company said, ". . . my personal finances are such that I have found it possible and desirable (regardless of market price) to purchase Simmons stock during December for each of the last several years."

EXHIBIT 5-5

FREQUENCY DISTRIBUTION OF COMPANIES BY
THE COEFFICIENT OF CORRELATION BETWEEN
THE INSIDERS' TRANSACTIONS AND THE LAGGED STOCK PRICE

Correlation Coefficient Between	No. of Companies in Which the Insiders' Transactions Correlated with Their Stock's Lagged Price Performance
+.8000 - +.8999	1
+.7000 - +.7999	1
+.6000 - +.6999	7
+.5000 - +.5999	4
+.4000 - +.4999	7
+.3000 - +.3999	10
+.2000 - +.2999	5
+.1000 - +.1999	16
.0000 - +.0999	8
-.0001 - -.0999	10
-.1000 - -.1999	5
-.2000 - -.2999	2
-.3000 - -.3999	3
-.4000 - -.4999	1
-.5000 - -.5999	0
-.6000 - -.6999	1
Unclassified	2
Total no. of companies with 6 or more monthly observations	83

This exhibit prompts two comments. First, a linear model, at least in the past, was a fairly good description of the forecasting properties of the transactions in approximately 19 executive groups in the sample. Second, the evidence seems to indicate that company-by-company experience is vastly different from the average correlation mentioned above in the discussion of Exhibit 5-1.

The correlation results alone do not adequately describe the relationship between the proportion of buyers over sellers, or vice versa, and the rate of advance or decline of stock price relative to the market six months later. The average regression coefficient of +1.24 per cent per net transactor for all companies in the sample provides a clue to the rate of the relative percentage of change among the companies. Another clue is provided by comparison of the average performance of the stocks bought with that of the stocks sold, by company. The problem implicit in the rest of this chapter is: what explains the low average correlation?

Superiority of insider-bought
stocks over insider-sold stocks
as forecasters

A second test is desirable to substantiate the conclusion that the forecasting hypothesis is tenable. The

model assumes the hypothesis that the population of insider-bought stocks out-performs the population of insider-sold stocks. A test of the difference between the two sampled means will corroborate the results of the binomial test on the signs of the 48 monthly correlations of composite results. A significant difference between the two sampled means will allow the inference that the two population means are different from one another.

The mean performance of the stocks in the aggregate is presented in Exhibit 5-6, classified by the index denoting the intensity of the monthly trading activity. The exhibit shows that the 1,507 observations were divided about equally between net buying and net selling.⁷ It also suggests that brisk monthly trading by any executive group is relatively infrequent. In fact, 1,135 monthly observations show only one net buyer or one net seller. This particular sub-sample represents 75 per cent of the total. It will be shown later in the section on forecasting direction that this sample is

⁷ During 1957-1960 the market experienced two stock-price cycles and the economy went through one business cycle. Despite two periods of falling stock prices the market was rising substantially over the period studied. In fact, the SEC Stock Market Index advanced about 50 per cent from January, 1957 to June, 1961. It is interesting to note that insiders were selling on balance during this period. In terms of observations the balance is 776 to 731, but in terms of net transactors the balance is 1,111 to 984.

EXHIBIT 5-6

RELATIVE PERFORMANCE OF STOCKS PURCHASED AND SOLD
BY THE INSIDERS-MONTHLY-ACTIVITY INDEX

Net No. of Buyers (+) or Sellers (-) Per Stock per Month (Col. 1)	No. of Monthly Observations (Col. 2)	Average Performance Relative (6 Mos. Lag) to the Market (Col. 3)
+7	3	- 1.45%
+6	3	+11.37%
+5	6	+ 2.63%
+4	12	+15.26%
+3	22	+ 5.94%
+2	116	+ 5.20%
+1	569	+ 4.00%
Total no. of net buying observations	731	
Mean performance of insider-bought stocks, weighted by column (1)		+ 4.94%
Mean performance of insider-bought stocks, not weighted by column (1)		+ 4.45%

EXHIBIT 5-6--Continued

Net No. of Buyers (+) or Sellers (-) Per Stock per Month (Col. 1)	No. of Monthly Observations (Col. 2)	Average Performance Relative (6 Mos. Lag) to the Market (Col. 3)
-1	566	+ 2.17%
-2	137	+ 3.37%
-3	46	- 8.01%
-4	15	+ 4.49%
-5	5	- 7.30%
-6	3	-16.50%
-7	3	- 8.43%
-9	1	-19.00%
Total no. of net selling observations		776
Mean performance of insider-sold stocks, weighted by column (1)		+ .59%
Mean performance of insider-sold stocks, not weighted by column (1)		+ 1.62%
Difference between sampled means, weighted		4.35% ^a
Difference between sampled means, not weighted		2.83% ^a

^aHighly significant at the .01 level.

the least significant and, by itself, would not allow us to reject the hypothesis of independence at the .01 level between the transactions and price performance variables.⁸

Method of averaging.--The measures of performance in Exhibit 5-6 are arithmetical averages. The cumulative effect of arithmetically averaging percentages is a slight bias toward the positive side. However, this limitation does not weaken the validity (or significance) of the correlation or chi-square results in the two major divisions of this chapter, since these tests deal with individual cases, not averages of grouped observations through time.⁹

Despite this operational defect, average-performance measures have some utility. Any bias will appear in both samples of stocks purchased and sold.¹⁰ A comparison

⁸This finding and the two means for the one-net-buyer and one-net-seller sub-samples of +4.0 and +2.2 respectively suggest that the average intercept for the total sample may be approximately +3.1 per cent. In other words, the 100-stock sample may have out-performed the market during 1957-1960 by as much as 3.1 per cent.

⁹This bias partially explains why the average intercept for a given company tends to be greater than zero in the model.

¹⁰This limitation suggests that a mean of zero is an inappropriate standard for the average-relative performance of the market as a whole in this study. Thus, statements that a given average semi-annual performance is better or poorer than the market in general may be suspect. Experimentation, however, does not reveal a biased result and does

between the two percentages of mean performance in both the aggregate and company data does provide evidence of a forecasting difference between insider net buying or net selling.

Two weighting techniques.--One weighting scheme follows the linear model used in the regression analysis. Thus, each observation is weighted by the net number of buyers or sellers. If there are four more buyers than sellers of a particular stock during a month, this stock's performance would be weighted in the over-all average four times as much as another observation in which the index of the insiders' transactions denotes one net buyer. This is equivalent to investing four times as much money in the former. The computation of the average performance of the insider-sold stocks could be similarly weighted in accordance with the net number of sellers in each observation. This scheme results in an average performance for the insider-bought stocks of +4.94 per cent, compared to the average of the insider-sold stocks of +0.59 per cent. The difference between the two sample means is 4.35 per cent and highly significant at the .01 level.

A second weighting method is consistent with the

not support this suspicion. Consequently, these statements may be reasonable.

chi-square tests and the binomial model which will consider each observation equally. Thus, if an equal amount of money is invested in each observation regardless of the number of net buyers or net sellers that month, the performance of these two samples relative to the change in the market as a whole would have been +4.45 and +1.62 per cent respectively. The difference between the two sample means, weighting each observation equally, is 2.83 per cent and also highly significant at the .01 level.¹¹

Both the weighted and unweighted averages of stocks bought and sold resulted in sample estimates that were significantly different at very high levels of confidence. The smaller difference of 2.83 per cent between the sampled means of insider-bought and insider-sold stocks could be attributed to chance less than one time in a hundred. (The difference of 4.35 per cent is, of course, even more significant.) Thus we can, with reasonable confidence, reject the hypothesis that the true means of these two populations are equal.

Since we do not have a representative standard for the average semi-annual record of the stock market's performance relative to itself (which theoretically should be

¹¹See Appendix H for the formulas used.

zero), we cannot infer that the insider-bought stocks showed a semi-annual record on the average which was 4.94 per cent better than the "average" common stock. Nor can we conclude that the insider-sold stocks achieved a semi-annual result which was 0.59 per cent better, on the average, than the market. But we can state that in terms of the model the insider-sold stocks achieved a six-month result that was on the average poorer than the insider-bought stocks by 4.35 per cent.

If the 1,135 less important observations--transactions by one net buyer or one net seller--were eliminated, the results would suggest that, on the average, observations showing more material net buying or net selling forecast the relative advance or decline of the stock price lagged six months. Thus, it would appear that the sub-hypothesis that insiders forecast through their sales transactions the price decline of the stock relative to the market is valid only for observations showing three or more net sellers during the month. Exhibit 5-7 has a bearing on this point. It presents estimates of the amount of dispersion in the data on the basis of seven defined random samples during 1957-1960.

Measures of dispersion in aggregate data.--Despite

EXHIBIT 5-7

A SUMMARY OF THE FORECASTING PROPERTIES OF THE INSIDERS' TRANSACTIONS IN 98 COMMON STOCKS SELECTED RANDOMLY DURING 1957-1960

Seven Samples (The Proportion of Buyers over Sellers (+), or Sellers over Buyers (-), in a Stock During the Month)	Sample Size (n)	Mean Per cent of Semi-annual Performance Relative to the Market	The Standard	
			Deviation of the Per cent (S_y)	Error of the Mean ($S_{\bar{x}} = \frac{S_y}{\sqrt{n}}$)
+3 to +7	46	+8.0	15.3	2.3
+2	116	+5.2	15.3	1.4
+1	569	+4.0	16.8	.7
-1	566	+2.2	19.3	.8
-2	137	+3.4	22.0	1.9
-3	46	-8.0	15.0	2.2
-4 to -9	27	-2.3	13.4	2.6
Totals	1,507			

evidence supporting the forecasting hypothesis, the dispersion is still larger than the average percentage of performance. The implications and hypotheses that can be inferred from this exhibit are reserved for the final chapter. The large variation suggests that the chances of a big gain or loss relative to the market are high, and that the expected or average performance is relatively small. For present purposes, this exhibit confirms the diversity of performance among the insider groups.

Variation in performance among companies.--Averages tend to conceal the variation in insider-group performance as it is related to the market average. The evidence of this diversity corroborates the diversity in the individual correlations. This evidence has been relegated to Appendix I and is briefly summarized in Exhibit 5-8.¹²

The two tables in Appendix I rank the executive groups according to their average percentage of predictive accuracy relative to the market when buying and selling their company's stock. For example, the 15 monthly purchases (i.e., 15 net buying observations) by the executives of American Airlines averaged +10.2 per cent greater than

¹²The detailed averages of percentages by company in the appendix weight the monthly observations of buying or selling equally.

EXHIBIT 5-8

COMPANIES RANKED BY AVERAGE PERFORMANCE
(NET BUYING AND NET SELLING)
OVER THE SIX MONTHS^a

	Average Percentage Performance in One or More Observations of	
	Net Buying	Net Selling
No. of successful companies ^b	63	47 ^c
No. of unsuccessful companies ^b	31	41
Total no. of companies	94	88
No. of companies never buying or selling	6	12
Range of averages in the two rankings:		
Best average	+64.65%	-25.90%
Worst average	-26.51%	+25.62%

^aThis exhibit is a brief summary of data presented in Appendix I.

^bSuccessful = transactions forecast market price; unsuccessful = transactions did not forecast market price.

^cGiven the average of +1.62 per cent for all stocks sold, the greater frequency of companies with negative means (47) is explained by the number of observations. There were only 336 observations in the 47 successfully sold stocks compared to 440 net selling months in the 41 unsuccessful sold stocks. This suggests that frequently trading groups in relatively fewer companies consistently forecast in error and dilute the average correlation.

the market and the ten monthly sales averaged -5.2 per cent relative to the market over each six-month period. American Airlines is one of the two classes of successfully forecasting executive groups in Exhibit 5-8. Sixty-three of the 94 groups with one or more months of net buying have positive averages of performance, and 47 of the 88 groups with at least one month of selling have negative averages denoting success in forecasting relative price declines.

Although there were more months of a rising market than a falling market during 1957-1960, chance should give an approximately equal number of successful and unsuccessful averages because each of the observations is deflated. Whatever the expected distribution, the actual frequencies in the sample are different from one another. Twelve insider groups never sold their company's stock, and six groups never bought any during the four year period. Only two companies have executives who were not observed to make transactions in their company's stocks. These two appear in both the twelve- and six-company frequencies. It is doubtful that many companies, if any, have a rigidly conservative policy governing insider trading.¹³

¹³Other reasons probably explain the complete absence of insiders' transactions in the common stock of Wheeling and Lake Erie Railway Company and Rhodesian Selection Trust Limited. The Nickel Plate Road owns 86.01 per

Over-all, insider buying and insider selling were successful predictors, with net buying relatively more successful. If the standard for average success or failure is higher than a mean of zero, the number of successful insider-groups forecasting advance will decrease but the number of successful insider-groups forecasting decline will increase. Thus the difference in the two distributions remains.

Another method of summarizing this appendix is to ask: how many of the companies had both a positive average for the net buying months and a negative average performance for the net selling months? Conversely, how many of the executive groups were consistently wrong, on the average, with negative and positive means of performance for the buying and selling respectively? Twenty-seven groups were successful, and only nine consistently failed to forecast. The executives of American Airlines are one of these 27 groups after jointly considering the two performance summaries in the appendix. Because some groups were inactive in buying or selling, 27 successful and nine unsuccessful companies represent 32 per cent and 11 per cent of those in

cent of the common stock of Wheeling (as of May 28, 1963) and purchases any shares offered for sale. Rhodesian Trust is an alien corporation and the Commission generally does not enforce the disclosure provisions of trading by corporate insiders in alien corporations.

the two samples.

Still a third way to summarize the average performance (of stocks bought vs. sold) within a company is to ask: how many of the groups' purchases performed better than that same company's sales? Sixty companies were successful on this score and only 24 were not.

Forecasting the Direction of Change

Since the linear model produced such weak results, a simpler model forecasting direction only may shed some light on the relationship between transactions and performance among the companies. This model assumes that the activity of a large number of net buyers or sellers forecasts the "certainty" of the direction of the price movement relative to the market, rather than the magnitude of the change. In other words, one possible explanation for the weak results of the linear model is that for some executive groups the linear relationship between the number of buyers less sellers and the stock's performance is not appropriate.

It is quite possible that activity by a relatively large number of net buyers or net sellers in a month is not an indication of the relative magnitude of the expected price movement in that stock. Instead it may be hypothe-

sized that the number of net buyers or sellers is a consensus that the expected price movement is likely to materialize. If there is very little risk that their expectations will prove incorrect, the profit-maximizers may be satisfied with a smaller gain. Thus, corporate executives could very well be successfully forecasting their company's stock price, even though registering a low or even negative correlation coefficient. For example, the executives of a company may always be net buyers, and their forecasts of the price of their company's stock, independent of the market, could prove correct 100 per cent of the time. However, the percentage of increase of each case may be in an inverse relationship to the number of buyers in each month and, if the fit is good, the negative correlation may be large.

This hypothesis of a low correlation between the variables (the number of transactors and the relative rate of change) and, at the same time, a strong correlation between the transaction and the direction of the price change may aptly describe the relationship in some of the companies. The purpose of this section is to identify these executive groups, to analyze their trading patterns, and to try to deduce from the evidence the diluting "causes" of the low correlation on the average. The executive groups of com-

panies with consistently successful forecasting records and those who consistently failed to forecast in either of the two models will be identified. In any large sample, chance alone could account for a number of groups with very good or very poor forecasting records. It will be useful to try to appraise the chance probability of these "superior" and "inferior" forecasting records of past performance.

Aggregate data

Are the insiders' transactions significant predictors of direction, or are their net purchases or net sales irrelevant to the stock's subsequent price performance? If the latter, they have no predictive value, and any apparent forecasts would be a matter of chance. The hypothesis of independence was tested by an application of the chi-square method. The χ^2 tests on the summary of the data in Exhibit 5-9 provide statistically significant evidence for rejecting the hypothesis of independence at the .01 level. Thus, the third and final statistical test of the hypothesis that insiders forecast through their transactions the market price of their company's common stock reaffirms the previous two tests and methods. Moreover, there is strong evidence of a successful filter for transactions--that the number of transactions in a month is more likely to forecast the

EXHIBIT 5-9

AGGREGATE RESULTS OF DIRECTION-PERFORMANCE
IN CORPORATE INSIDERS' TRANSACTIONS^a

Description of Sampled Frequencies	Actual Performance Lagged Six Months Relative to the Market (The No. of Times the Stock Actually)	The No. of Cases of		Over-all Success Percentage
		Buying	Selling	
Total sample of 1,507 monthly observations ^b	Advanced Declined Total Success Percentage	427 304 <u>731</u> 58.4	383 393 <u>776</u> 50.6	 54.4
Sub-sample of 1,135 cases of one net buyer or seller ^c	Advanced Declined Total Success Percentage	319 250 <u>569</u> 56.0	285 281 <u>566</u> 49.6	 52.9

EXHIBIT 5-9--Continued

Description of Sampled Frequencies	Actual Performance Lagged Six Months Relative to the Market (The No. of Times the Stock Actually)	The No. of Cases of Net		Over-all Success Percentage
		Buying	Selling	
Sub-sample of 372 cases of two or more net buyers or sellers in a month ^b	Advanced	108	98	
	Declined	<u>54</u>	<u>112</u>	
	Total	<u>162</u>	<u>210</u>	
	Success Percentage	<u>66.7</u>	<u>53.3</u>	<u>59.1</u>

96

^aEach observation has a pair of values: the value summarizing the insiders' activity in a given stock during the month and the value denoting that stock's price performance relative to the market six months later. Thus, the sign of the two values must be either plus or minus. The four possible combinations are plus-plus, plus-minus, minus-plus, and minus-minus. Only plus-plus or minus-minus observations are successful forecasts of direction relative to the market. Using a chi-square test these frequencies were:

^bSignificant at the .01 level

^cNot significant at the .01 level.

direction of the price change than the record of any single transactor.

Exhibit 5-9 shows that the 1,507 observations in the sample are composed of 731 net buying and 776 net selling observations. This means that on 731 occasions insiders in a given month bought more frequently than they sold and, therefore, in terms of the general model, their buying would forecast a rise in the price of that stock six months later. In fact, six months later, on 427 occasions the stocks had gone up and on 304 they had gone down, relative to the market. This is a 58.4 percentage of success, or about four successes out of seven trials. On 776 occasions more insiders were selling, thereby forecasting a decline in their company's stock price relative to the general market movement. The stocks actually declined only 393 times for a percentage of success of slightly more than 50. While the transactions summarized in this study were statistically significant predictors of direction, the net selling results are not much better than coin-tossing. Thus, selling by corporate insiders may not signal worse-than-average performance over the next six months.

Profit maximization.--In the previous chapter were listed possible motivations consistent with rational buying

or selling by an individual executive but not consistent with the interpretation that the executive under- or over-valued the shares. We reasoned that by aggregating the transactions of all the executives during a month, a clearer indication of profit maximization consistent with the logic of the hypothesis would emerge. In other words, the greater the excess of buyers over sellers or sellers over buyers, the more likely is the forecasting deduction a correct interpretation. This notion that we can identify and eliminate the "misleading" transactions can be tested by the same technique.

This filtering operation reduces the size of the sample by 75 per cent, as only 372 out of the 1,507 observations showed either two or more net buyers or net sellers. The remaining 1,135 observations summarize monthly transactions in a stock by one net buyer or net seller. A chi-square test on the distribution of these observations was not significant at the .01 level.

In a large majority of the 1,135 observations summarizing one net buyer or seller, the gross activity is also one buyer or one seller that month. Thus, while the +1 value assigned to the insiders' transactions in a stock during a month could theoretically summarize three purchasers and two sellers, in fact it usually summarizes one purchaser

and no sellers. Similarly, the net selling observations frequently summarize the gross insider activity in the stock as well. During the few months when the index of monthly trading activity for a few companies was relatively large (for example, five net sellers) the number of sellers before subtracting the number of buyers was invariably five or six. In short, brisk activity by a company's executives during any one month is relatively infrequent, but when it does occur they generally conform to the same pattern--either buying or selling--that month.

Exhibit 5-9 also summarizes the more meaningful observations of two or more net buyers or net sellers of a stock during a month in terms of profit maximization, and the distribution is highly significant at the .01 level. It tends to support the hypothesis that insiders forecast the relative direction of their company's stock six months later. The exhibit reveals that 162 of the 731 net buying observations summarize monthly activity of two or more buyers than sellers in a stock. Six months later, the relevant stock actually advanced 108 times and declined only 54 times for a two to one ratio or a 66.7 success percentage. And 210 of the 776 net selling observations summarize monthly activity in a stock by two or more sellers than buyers.

Only 53.3 per cent of the time did the stock actually decline six months later relative to the market, the price going down 112 times and going up 98 times.

Several remarks seem warranted. First, the statistical significance of the entire sample appears to rest heavily on the successful forecasts of two or more net buyers or sellers of a stock, and observations containing two or more comprise less than 25 per cent of the sampled observations. Second, the probability of a successful forecast of direction of price change of a stock seems to be related to the number of its net buyers or sellers in a month. Monthly activity in a stock by at least two such net buyers or sellers improves the average chance of success in forecasting from about 54.4 per cent to 59.1 per cent. Finally, when two or more insiders have predicted that a stock's price will go up, it is more likely to advance relative to the market than a stock predicted, by two or more insiders, to decline.

As mentioned earlier, executives sell their company's stock for many reasons other than a conviction that its price is about to decline. One of these reasons is to finance the purchase of additional stock at option prices. It seems not unreasonable to estimate that much executive selling is done for precisely this reason. The data studied

include all sales but exclude purchases on option, however, which may obscure the clarity of the attempted classification between net buying and net selling; if so, it may well explain why net selling is less successful as a prediction of price change than net buying in the sample. This may be a reasonable explanation if stocks of corporations with stock-option plans perform better-than-average. More precisely, it is conjectured that stocks of corporations whose executives are actively exercising stock options are probably better than average performers relative to the market. An additional explanation of the relatively inferior performance of the selling observations is simply that executives may be liquidating holdings for various reasons consistent with their expectations and risk preferences, and their plans to maximize their income after taxes.

Company experience and trading patterns

The remainder of this chapter sets aside the conclusion (based on empirical fact regarding net purchases, at least) supporting the interpretation of profit maximization in monthly operations by two or more net transactors. Since there were relatively few of these monthly observations in each company, an advantage will accrue by subjecting the total sample of 1,507 observations to analysis rather than

the more significant sub-sample of 372 observations.¹⁴

There has been some evidence that trading intensity in a stock during a month is a useful discriminator of forecasting performance. This segment of the study will compare the trading frequencies and patterns among the companies for possible clues to improve performance.

One purpose of this sub-section is to attempt to detect the companies in which executives are allowed to operate largely with personal profit maximization in mind. In order to filter out those companies that might discourage the practice, activity is defined as the number of monthly observations out of a possible 48, ignoring the number of net buyers or sellers in any one month.

For this reason, the summaries of direction-performance by company in the text of this study are the details of the total sample of 1,507 observations shown earlier in Exhibit 5-9, while Appendix J details by company the 820 successful forecasts out of 1,507 observations. Their aggregate percentage of success is 54.5 per cent. Exhibit 5-10 summarizes the distribution of the percentage of success

¹⁴Binomial probabilities will be the principal method of analysis and the larger the number of observations per company, the closer is the binomial distribution (among the companies) an approximation of a normal distribution. Selective samples on the basis of the conclusions in this chapter are tested in the next chapter.

EXHIBIT 5-10

DISTRIBUTION OF PERCENTAGE OF SUCCESS
AMONG THE COMPANIES

Percentage Range of the No. of Successes to Total Forecasts per Company ^a	Number of Companies
Greater than 70%	18
31% to 69%	73
Less than 30%	<u>7</u>
Total	<u><u>98</u></u>

^aIf you extend the two bordering percentage intervals by 5 per cent each, the distribution from top to bottom is 27, 60, and 11 companies, and the conclusions are the same.

among the companies. It shows that the executive groups of most companies experience roughly average success, and that consistently successful forecasts are more than twice as likely as consistently unsuccessful observations.¹⁵

However, a listing of percentages of successful prediction has limited utility if what is wanted is a test of the hypothesis that frequency of trading is related to successful prediction. It does not show the magnitude of the number of successes in each company. A detailed ranking of the 98 companies by the success percentages is limited because the total number of observations in each case varies from 1 to 39 among the companies.

Since the total number of successful and unsuccessful observations per company varies, a more useful technique may be the estimated probability of forecasting as well or better. For example, assume that the executives of three companies have forecasting records of monthly successes out

¹⁵This two-to-one ratio of success is based on both purchase and sale observations and differs from the same ratio shown earlier in Exhibits 5-8 and 5-9, which were performance summaries of purchases only. Even these two earlier exhibits differ in sample construction. In Exhibit 5-8, this ratio summarizes the average percentage of performance of the total sample of 731 observations of net purchases distributed among 94 companies, whereas in Exhibit 5-9, this significantly successful aggregate ratio of direction-performance emerged in the sample of 162 observations of net purchases by two or more buyers than sellers.

of monthly transactions as follows: 1 out of 1; 4 out of 5; and 14 out of 20. These success percentages of 100, 80, and 70 result in a ranking which is contrary to the significance of these three performance records. The coin-tossing analogy makes it easily seen that the probability of doing as well or better as a matter of chance would be .50, .19, and .06 respectively. In other words, the ranking of the three companies according to the significance of their forecasting records is exactly the reverse of their ranking by success percentage.

If there is no relationship between insiders' net buying and selling observations and relative price change lagged six months, the probability should be one-half that the value of the stock will move in the direction indicated by the transactions. If the stock price and the transactions are independent, the number of successful net buying and net selling observations in a company-series will have a binomial distribution with n equal to the total number of observations and p equal to one-half. In other words, these assumptions of a null hypothesis suggest that an appropriate description of achieved success for each company is the estimated probability of forecasting as well or better. The calculation of these probabilities is facilitated by using the normal-distribution approximation of the binomial

distribution.

The companies are ranked by their binomial probabilities in Appendix J, and the sampling frequencies are summarized in Exhibit 5-11. The probabilities derived from the binomial tables are approximate because the observations are not wholly independent. There is some dependence in them because of the six-month overlap, but this dependence does not increase the number of observed successes.¹⁶ The effect of the dependence is to make the true probability smaller in some cases and larger in others than the calculated probability, depending on the trading behavior of executives, who might always buy or always sell. In short, the probabilities are rough approximations. However, the method is appropriate, and it does give some notion of the magnitude of the number of successes over what would be expected from chance alone.

The first and last ranked companies in Appendix J will serve to illustrate the summary in Exhibit 5-11. The executives of American Water Works, ranked first, engaged in transactions with their company's stock as net buyers or net sellers in 23 months. Nineteen of their 23 forecasts proved

¹⁶A Success is a pair of matched signs per observation.

EXHIBIT 5-11

A FREQUENCY DISTRIBUTION OF THE NUMBER OF COMPANIES
BY THEIR INSIDERS' FORECASTING RECORD

The Estimated Probability Range of an Equal or Better Forecasting Record	Total Frequencies	The Number of Companies in the Total Sampling Distribution by Quartiles (No. of Monthly Forecasts out of a Possible 48)			
		Upper	Mid Quartiles	Lower	
		Very Active (21-39)	Active (14-20)	Moderately Active (10-14)	Relatively Inactive (1-9)
.00 - .10	15	8	1	4	2
.10 - .20	12	4	4	2	2
.20 - .30	10	1	2	4	3
.30 - .40	5	1	1	2	1
.40 - .50	7	1	3	1	2
.50 - .60	6	2	2	1	1
.60 - .70	10	2	5	0	3
.70 - .80	11	0	4	4	3
.80 - .90	10	0	1	6	3
.90 - 1.00	<u>12</u>	<u>6</u>	<u>1</u>	<u>1</u>	<u>4</u>
Totals	<u>98</u>	<u>25</u>	<u>24</u>	<u>25</u>	<u>24</u>

correct. Nineteen times the stock either advanced or declined six months after net purchases or sales, respectively. The estimated probability of being as successful or more successful than that is .0013. Thus, this first ranked company is one of 15 executive groups whose chance probability of achieving such a successful forecasting record is .1 or less. Ignoring the intensity of the monthly activity (the number of buyers less sellers), American Water Works, with insider trading in 23 out of the 48 months, is one of the eight successful companies which is also classified as very active.

The executives of Patino Mines and Enterprises traded in their company's stock in only one month, as buyers. Six months later the stock had declined relative to the market. The probability of doing as well or better than zero successes is 1.00, and this company is one of 12 companies in the Total Frequencies column and one of four in the Relatively Inactive Quartile column in the .90 - 1.00 probability interval.

Total sample.--The distribution of frequencies in the Total Frequencies column of Exhibit 5-11 is not statistically significant.¹⁷ The expected (frequency) distribution

¹⁷This lack of statistical significance can be

for each probability interval is approximately ten companies.¹⁸ Since the actual frequencies are not significantly distributed in support of a forecasting hypothesis, this is inconsistent with earlier evidence (based on the same data of 820 successes out of 1,507 forecasts).¹⁹

This evidence suggests that executive groups tend to be either very successful or very unsuccessful; fewer executive groups than expected enjoy "average forecasting success."²⁰ This apparently contradictory evidence suggests influences not yet empirically detected in this study. For example, if some corporations tolerate stock trading by

intuitively seen in the distribution of 49 groups with records better than .5 and another 49 groups performing worse than this.

¹⁸In a random sample of 98 forecasters, each having the same probability of a successful forecast, we could expect that approximately 9.8 of the 98 observed frequencies of successful forecasts would be such that the probability of achieving such a frequency or greater is less than .10. Similarly another 9.8 companies could be expected to have unsuccessful forecasting records such that the probability of doing better is .9 or more.

¹⁹Since the chi-square test on the aggregate data (in Exhibit 5-9) was significant at the .01 level, these negative results were not expected. This inconsistency will be explained later in the "weighting," i.e. the number of observations in each company.

²⁰"Average forecasting success" is here defined as the chance probability of between .4 and .6 of equalling the insiders' forecasting record of n successes out of so many forecasts.

their executives, the frequency of trading in these stocks should be higher than in those of other corporations. The sub-hypothesis is that actively trading executive groups forecast the market-price of their company's common stock. In other words, are the companies in which the insiders are infrequent traders in that stock a diluting factor?

The distribution of frequencies tends to support the sub-hypothesis that insiders in some companies have forecasting records better than what they could have achieved by pure chance and, at the same time, the least successful records are worse than could reasonably be attributed to chance. A corporate policy that encouraged its executives to trade in its stock might shed some light on the superior records, but a policy forbidding buying or selling or both does not logically explain the exceedingly poor forecasting records, although it might explain the relative inactivity in trading in a company's stock. However, it is still reasonable to expect the forecasting records of companies whose executives' trading is influenced by policy considerations to be randomly distributed among the probability intervals, not concentrated in the higher probability ranges.

Activity classification.--The quartile distribution

of the total sample by the activity in the stock during the four years is both suggestive and puzzling. The frequency distribution in the very active (or upper) quartile is the only activity classification found to be significant at the .01 level using a chi-square goodness-of-fit test. (The expected distribution is 2.5 companies for each probability interval.) This would suggest that the statistical significance of the chi-square test on the data in Exhibit 5-9 (the distribution of the 820 successes out of the 1,507 allowed us to reject the statement that insiders' transactions have no predictive value) rests on performance in relatively few companies in which the executives were active traders. However, the record of the very active executive groups (in the upper quartile) is marred by the least successful groups in the distribution. Since six of the twelve least successful groups in the total sample were in the very active quartile, any judgment on the significance of activity in a group must be reserved. To generalize about an activity classification that does not distinguish between net buying and net selling nor the pattern of the trading activity is limited. In other words, it appears that monthly activity of two or more net buyers or sellers per observation among all the companies explains the significance of the relationship in the total sample better than the activity classifi-

cation of the number of observations per company over the four years, ignoring the intensity of the monthly activity as shown earlier in Exhibit 5-9.

As noted above, it is very difficult, on the basis of possible corporate sanctions against insider trading, to explain why as many as six of the 25 companies in the very active quartile performed so poorly. Since six companies are -2.33 standard deviations away from the expected number of companies in this interval, it is probably not explainable by chance. Similarly, the eight best records in the quartile (+3.67 standard deviations) are not likely to be due to chance. One may reasonably explain the superior forecasting records on the basis of the logic of the forecasting deduction. But if the forecasting hypothesis is tenable, how does one explain significantly inferior performances?

It is possible to rationalize a given company's experience, but such conjectures are not empirically founded. For example, one of the six companies in the upper quartile whose executives were least successful in forecasting direction was Federated Department Stores. The executives of this company were selling on balance in thirty-one months and buying in one month for a total of thirty-two observations during 1957-1960. Since the price of this stock was generally rising faster than the market as a whole in almost

every month, the executives were correct in only four of the thirty-two forecasts. One can forecast that the executives of Federated will continue in the future to be predominantly sellers of their company's stock. This statement is akin to the conjecture that these transactions are independent of the future price, because one cannot logically forecast the future price of this stock relative to the market. If this stock were included in future study and it continued to outperform the market, it is likely that it would appear unsuccessful. If the stock's price continually performed poorer than the market, the binomial probability would suggest that the insiders were successful. However, in this case, if the hypothesis of independence is tenable, a successful or unsuccessful label would be inappropriate, as the variables are apparently unrelated. If the forecast of continued net selling by the executives of Federated is plausible, it is based on (conjectures of) the relatively high concentration of stock ownership held by management and their families, and the company's stock option plan.

If we decide to eliminate the unsuccessful observations in Federated from the sample, it would seem that the successful observations in Sears Roebuck (and American Water Works) should also be eliminated. Since the executives of Sears were predominantly buyers of their company's stock,

and the stock generally out-performed the market, this successful performance may be very similar to Federated's unsuccessful performance, i.e., an independent result. If we exclude unsuccessful observations and include successful ones, we will be guilty of statistical manipulation and generalization will be limited. In the next chapter, a test is performed on selected companies from the random sample. The companies that are relatively inactive and those that are active but predominantly buying or selling will be eliminated from the sample. Thus, companies like Patino Mines, Federated, and Sears will be excluded from the tests.

Activity patterns.--This discussion serves to introduce a classification system for the executives' trading patterns over the four years that takes into account the intensity of the monthly activity, its sign, and the frequency of the monthly observations. The four patterns in the time series of the insiders' transactions are classified by visual inspection of the data as either cyclical, irregular (or erratic), predominantly buying, or predominantly selling. (A company time series of the insiders-monthly-activity indices is classified as cyclical if there are consecutive months of net buying and consecutive months of net selling.)

The total sample summarized in Exhibit 5-11 suggests that the records of 15 executive groups were significant at the .10 level, and those of 12 groups were equally unsuccessful. The most and least successful companies are listed in Exhibits 5-12 and 5-13, along with information on the trading pattern in each company.

Perhaps the cyclical pattern is consistently related to successful prediction. While the hypothesis supporting this notion is formulated and tested in the next chapter, a clue that this pattern-selection approach will fail to lead to more positive results is indicated in Exhibit 5-13, where four of the 12 poor performers also had cyclical transactions series.²¹

Executives of American Water Works and Sears appeared to be consistent buyers, and the officials of White Motor and General Dynamics were consistent sellers. While these

²¹For example, the executives of International Telephone were buying in 1957-1958 and selling in 1959-1960. Since prices were higher in the second period, they probably realized profits, but the measures of the variables in terms of the model indicate poor timing in general. There are some elements of success, however, in this executive group. For example, the month of the most active buying (four net buyers) occurred in December, 1958, and led a six-month rise of 19.38 per cent greater than the market. On the other hand, the trough in the transactions series (three net sellers) occurred in April, 1960, and unsuccessfully led a 4.64 per cent rise in the stock relative to the market six months later.

EXHIBIT 5-12

LIST OF COMPANIES WHOSE INSIDERS' TRANSACTIONS
WERE VERY SUCCESSFUL FORECASTING DIRECTION
AND A DESCRIPTION OF THEIR TRADING PATTERN

Rank	Insiders of	Activity			Pattern
		No. of Months of Net		Total	
		Buying	Selling		
1	American Water Works	19	4	23	PB
2	American Airlines	15	10	25	C
3	Sears Roebuck and Co.	21	5	26	PB
4	General Electric	18	20	38	C
5	United Biscuit of America	6	8	14	C
6	White Motor Co.	6	23	29	PS
7	General Dynamics	5	32	37	PB
8	General Cable Corporation	7	13	20	C
9	Iowa Illinois Gas and Electric	7	0	7	CB
10	Union Chemical and Materials	11	11	22	C
11	General American Oil (Texas)	11	11	22	C
12	Consolidated Gas Utilities	5	7	12	C
13	South American Gold and Platinum	11	3	14	PB
14	United Cigar Whelan Stores	10	4	14	C
15	Kansas Gas and Electric	9	0	9	PB

Pattern Classification Key: C = cyclical (as observed by visual inspection); PB = predominantly buying; PS = predominantly selling; and E = erratic or irregular.

EXHIBIT 5-13

LIST OF COMPANIES WHOSE INSIDERS' TRANSACTIONS
WERE VERY UNSUCCESSFUL FORECASTING DIRECTION
AND A DESCRIPTION OF THEIR TRADING PATTERN

Rank	Insiders of	Activity			Pattern
		No. of Months of Net		Total	
		Buying	Selling		
87	American Molasses Co.	6	3	9	E
88	Starrett (L. S.) Co.	26	0	26	PB
89	Kimberly Clark	3	21	24	PS
90	U. S. Playing Card Co.	3	1	4	PB
91	Paramount Pictures Corp.	3	7	10	C
92	International Tel. and Tel.	13	15	28	C
93	Grayson Robinson Stores	2	22	24	PS
94	Northrop Aircraft	7	13	20	C
95	General Precision Equipment	5	18	23	C
96	Federated Department Stores	1	31	32	PS
97	Overland Corporation	2	0	2	PB
98	Patino Mines	1	0	1	PB

Pattern Classification Key: C = cyclical (as observed by visual inspection); PB = predominantly buying; PS = predominantly selling; and E = erratic or irregular.

executive groups successfully forecast their company's stock price in the past, this could be the result of chance and not evidence of a pattern with predictive utility. In other words, a useful principle of selection for future studies may require exclusion of insider groups which were either predominantly buyers or sellers in their companies' shares from the sample.

Executives of American Airlines, General Electric, Union Chemical and Materials, and General American Oil of Texas, all companies in which insider trading successfully forecast the market, were moderately active buyers and sellers of their companies' shares (having ten or more months of activity). These series are classified as cyclical.

Executives of companies who traded erratically, buying one month and selling the next, are conspicuously absent from the list of successful insider groups. Only one executive group among those consistently failing to forecast the market exhibited an irregular trading pattern. Thus, it would appear that insiders who buy and sell in a random manner from month to month enjoy average success.²² Since this was to be expected, the conclusion does not

²²The monthly trading behavior of Commercial Credit Corporation's executives is a clear example of erratic or irregular activity.

appear significant. The importance of this trading pattern is seen in contrast with the cyclical pattern. Why did the executives of American Airlines consistently buy cheap and sell dear, and why did the executives of Commercial Credit miss opportunities to maximize their profits about half the time? (The American Airlines executives continued to trade cyclically and successfully during 1960-1963 as well, further reducing the probability that this record of successful forecasting is a chance occurrence.)

Since Exhibit 5-13 shows that four of the unsuccessful groups traded cyclically during the four years studied, the inference that the cyclical pattern is a clear-cut case of executives who are attempting to maximize profits is not without its limitations. Perhaps intermediaries such as trusts, holding companies, and partnerships (which were included in the data studied) were not established for purposes of dealing exclusively in stocks and were therefore influenced by other considerations than profit maximization. These intermediaries may be philanthropic organizations, or trusts established for their children, and therefore transactions for these accounts may not represent true motivation for stock market capital gains. This and the observation that executives in many companies seem to be dealing in their company's stock without regard to timing is believed

to explain the low average correlation found and analyzed in detail in this chapter. Nevertheless, at this point in the analysis, the cyclical-pattern-approach to stock selection appeared to have promise.

Summary

Do insiders forecast their stock's price? The evidence in this chapter is consistent on this point. They do, but in neither a linear model nor a more general one was the relationship a strong one in random samples between the transactions of insiders and the six-month performance of their company's stock price relative to the market.

The results of three methods of analysis were reviewed in this chapter--correlations, averages, and direction-success frequencies. The aggregate results were tested and found to be statistically significant. Each executive group in the sample was ranked according to its forecasting scores. We found that the two models of relative performance lagged six months--one forecasting the extent of the change and the other the direction--yield almost identical aggregate results. (In other words, the support to the hypothesis given by each approach is equally strong.) However, the two models differ substantially in the particular executive groups they identify as reliable leading indica-

tors.

The following two exhibits of very successful and equally unsuccessful executive groups illustrate this point and summarize the two approaches. Exhibit 5-14 identifies the executive groups that were very successful in either forecasting direction or magnitude in the linear relationship originally hypothesized. The insiders in those companies who were equally unsuccessful are listed in Exhibit 5-15.

When success is defined as either a company whose insiders' transactions had a correlation coefficient significant at the .05 level or a binomial probability of direction-success of .10 or less, there results a list of 25 insider groups. Applying the same standards to unsuccessful groups (negative correlations significant at the .05 level and binomial probabilities of .90 or more) results in a list of only ten companies. Defining a successful or unsuccessful group as one meeting both criteria results in seven successful companies and one unsuccessful company.

The diverse correlations among the companies explains the low average correlation of +0.132 in the aggregate monthly tests. The variable correlations among the companies may be due to diluting factors. For example, there is a strong indication that the positive correlation

EXHIBIT 5-14

THE HIGHLY SUCCESSFUL SERIES

Company	With Respect to	
	Direction	Magnitude per Net Monthly Transactor
American Airlines	x	x
American Water Works	x	x
Sears Roebuck	x	
General Electric	x	x
United Biscuit of America	x	x
White Motor Company	x	
General Dynamics	x	
General Cable	x	x
Iowa Gas and Electric	x	
Union Chemical and Materials	x	x
General American Oil of Texas	x	
Consolidated Gas Utilities	x	
South American Gold and Platinum	x	x
United Cigar Whelan Stores	x	
Kansas Gas and Electric	x	
St. Joseph Light and Power		x
Spencer Kellogg and Sons		x
Consolidated Gas Utilities		x
Stix Baer and Fuller		x
Barker Bros. Corporation		x
Real Silk Hosiery Mills		x
Climax Molybdenum		x
Aldens, Inc.		x
San Diego Gas and Electric		x
Lerner Stores Corporation		x

EXHIBIT 5-15

THE SIGNIFICANTLY UNSUCCESSFUL SERIES
(BASED ON SIX OR MORE OBSERVATIONS)

Company	With Respect to	
	Direction	Magnitude per Net Monthly Transactor
American Molasses	x	
Starrett (L. S.) Company	x	
Kimberly Clark	x	
Paramount Pictures	x	
International Tel. and Tel.	x	
Grayson Robinson Stores	x	
Northrop Aircraft	x	
General Precision Equipment	x	x
Federated Department Stores	x	
National Lead		x

results when two or more insiders of the same company buy or sell, and these observations, spread among 77 companies, comprise less than 25 per cent of the sample of 1,507 observations. This made it possible to detect one diluting factor, transactions by one net buyer or seller. While one would expect more cases of two or more net transactors in actively trading groups compared to relatively inactive groups, the evidence more strongly supports the inference that the 75 per cent of the cases of one-net-transactor among all the companies is the diluting factor rather than that it is the 75 per cent of the companies that trade less often.

There is some indication that another diluting factor influencing the average relationship may be insiders who seem to make it a practice almost always to buy or sell their companies' shares.

The notion that selling by corporate insiders is a diluting factor is not proven, and rests on the appropriateness of a mean of zero as the standard for success or failure in the direction model. If the +3.0 per cent average intercept were the standard for success or failure in this model instead of the sign of the performance-index, the forecasting results of the selling transactions would improve while the edge in the buying transactions would diminish. The

insider-bought stock performed better than the insider-sold stock, and the stock sold by three or more insiders in a month consistently performed worse than the market. The sale of stock in order to purchase options may be still another uncontrollable variable.

Other conclusions based on aggregate results are summarized in Exhibit 5-16. One finding omitted from the exhibit is that the transactions and performance indices vary considerably among the individual companies. No consistent relationship between the two indices has been found. Generally the results suggest that the greater the numerical discrepancy between the buyers and sellers of a stock during the month, the more likely it is to perform better- or worse- than the market, and the greater will be its rate of advance or decline.

EXHIBIT 5-16

INSIDERS FORECAST THROUGH THEIR TRANSACTIONS
THE PRICE IN THE MARKET OF THEIR OWN COMPANY'S
COMMON STOCK: A SUMMARY OF SELECTED RESULTS

Sub-hypothesis	Results
1. The larger the proportion of monthly buyers over sellers (or vice versa) in a stock, the larger is the rate of advance or decline after six months relative to the market.	1. Average correlation: +0.132. Median correlation: +0.132. Average regression coefficient: +1.24 per cent per transactor. Average intercept: +3.1 per cent per zero transactors (an estimate).
1a. The probability of obtaining a positive correlation is larger than the probability of obtaining a negative correlation.	1a. Yes, at the .00001 level of significance.
2. Insiders' transactions forecast the direction of the price of their own company's common stock relative to the market six months later.	2. Yes, at the .01 level of significance.
2a. The larger the number of monthly transactors, the larger is the probability of advance or decline relative to the market.	2a. Accepted at the .01 level; over-all the frequency of success increased from 54.4 to 59.1 per cent.

EXHIBIT 5-16--Continued

Sub-hypothesis	Results
2a' The larger the number of insiders behaving alike in a stock during a month, the larger the average performance and the smaller the variation.	2a' Yes, but the variation remains large relative to the average performance.
3. Insider-bought stocks perform better than insider-sold stocks.	3. Yes: by 4.35 per cent per model for sub-hypothesis No. 1; by 2.83 per cent per model for sub-hypothesis No. 2. The smaller difference is significant at the .01 level.
3a. Insider-sold stocks perform worse than average.	3a. No.
3a' Brisk inside selling by three or more executives during the month has worse than average results.	3a' Yes.

CHAPTER VI

THE RESULTS OF COMPANY TOLERATION OF INSIDER TRADING FOR PROFIT

The inferences drawn at the end of Chapter V suggest a further avenue of approach to the predictive properties of insider tradings--the inference of profit maximization as seen in brisk monthly activity, and the inference of freedom to buy and sell the company's stock as seen in those executives that cyclically buy and sell over time. Does brisk inside buying and selling in companies which tolerate trading for profit by executives lead the market? Company-by-company experience varies so greatly from the averages that an alternative hypothesis might prove much more accurate: Net insider buying and selling predicts market trends in companies which tolerate (and possibly even encourage) trading for profit by executives. This hypothesis assumes that the weak relationship shown in the aggregate material may result from selling for other reasons than profit maximization, or there may be too many companies whose policy inhibits buying or selling. There may be other reasons as well.

To test this alternative hypothesis some means must be found to identify the companies that tolerate or encourage unrestrained insider trading. Since this information is not available, and no survey has been done, the investigator must infer (from a criterion) which companies possibly fit this situation.¹

Method Used in the Study

The sample of companies included only those which showed two or more net buyers and net sellers trading as insiders in two or more months.² Thirty-three companies of the original 98 remain after this selection. They are presumed to tolerate or even encourage buying and selling by their executives. If a company merely tolerates insider buying or selling under "special circumstances," these situations are not likely to arise for individual executives during the same two months.

Frequency of trading in these 33 companies over 48

¹Executives that traded in what appeared to me to be a cyclical pattern might seem erratic or irregular to another observer. Thus, the cyclical-pattern-approach lacks objectivity. I believe it is more worthwhile to delimit precisely the selection of this sample, instead of selecting companies by visual inspection of the time series of a company's transactions and labeling some of them as cyclical.

²These companies are listed in the condensed summary of trading activity in Appendix A.

months ranged from 10 to 39 monthly observations. Among these observations, only the forecasts by two or more net buyers or sellers are included in the test. It is presumed, as was brought out in Chapter V, that these transactions were chiefly motivated by profit maximizing reasons.

Results

The sample yielded by these filtering operations did not fare much better than earlier samples. Sixty-one out of 98 stocks which the insiders were buying (62.2 per cent) actually advanced relative to the market, and 81 out of 144 stocks they were selling (56.2 per cent) actually declined. The slight difference between these results and the 66.7 and 53.3 percentages of successful prediction for buying and selling, respectively, in the earlier (total) sample of two or more net buyers or sellers does not suggest that the method of selection was effective. The increase in percentage of accuracy of the net selling forecasts can be attributed to the deletion of predominantly selling companies like Federated, whose insiders frequently sold prior to substantial market advances in their stock. Similarly, the decrease in the percentage of accuracy of the net buying forecasts from 66.7 to 62.2 is probably explained by the elimination from the sample of companies whose insiders were

buyers, like Sears Roebuck and American Water Works.

Sample of Companies with Three or More
Net Buyers and Sellers Within Any One Month

Selecting a sample of companies which had three or more net buyers and net sellers in any one month yields only seven executive groups. In other words, corporate insiders in only seven companies showed this amount of concentrated insider buying and selling.³ Within these companies only transactions by two or more net buyers or sellers within a month were considered. These tests resulted in percentages of accuracy in prediction of 74.3 for the net buying forecasts and 59.2 for the net selling forecasts. Twenty-six of the 35 times advances were forecast the stocks advanced, and 16 of the 27 forecasts of decline were accurate.

Exhibit 6-1 identifies these companies and repeats the various summary statistics used in this investigation to describe the degree of successful prediction achieved. Only American Airlines and General Electric insiders have been previously identified as successfully forecasting the direction and magnitude of their company's stock price. The executives of Talcott, Inc., and United Cigar Whelan had

³These are not the same seven groups identified as successful in the previous chapter after jointly considering correlation and binomial scores.

EXHIBIT 6-1

THE SEVEN EXECUTIVE GROUPS OF THE 98 TESTED WITH THREE
OR MORE NET BUYERS AND SELLERS IN AT LEAST TWO MONTHS

Co. No.	Insiders of	Forecasting Performance Scores		
		Correlation (The Linear Model) ^a	Binomial Probability (The Direction- Only Model) ^b	Average Per cent of Performance of
				Net Buying Net Forecasts Selling Forecasts Forecasts
4	American Airlines	+0.52	.01	+10.2 - 5.2
15	Cerro de Pasco Corporation	+0.17	.70	- 5.9 -10.8
30	General Electric	+0.35	.01	+ 2.6 - 6.2
32	General Tire and Rubber	-0.14	.66	+10.5 +22.1
40	International Tel. and Tel.	-0.01	.96	+ 8.2 +10.8
87	Talcott (James), Inc.	-0.02	.14	+15.8 +15.8
95	United Cigar Whelan Stores	+0.15	.09	+ 6.9 + 2.9

^aThe higher the correlation the stronger the relationship forecasting magnitude of price change.

^bThe smaller the probability, the better the relationship forecasting direction of price change.

reasonable success in forecasting direction, though not in the linear relationship originally hypothesized. The executives of the remaining three companies did not seem to forecast successfully at all. However, there is an unusually consistent aspect of successful prediction if we consider the individual monthly forecasts that formed the peaks and troughs of the relevant transactions series. Exhibit 6-2 shows these observations, their indices of activity and performance, and other pertinent data. Multiple (or identical) "peaks" or "troughs," as defined by the value of the insiders' transactions index, are all listed in the exhibit in chronological order.

First, eight out of the nine forecasts of advance (89 per cent) actually advanced relative to the market. The only unsuccessful forecast, in fact, can be explained by external events which counteracted whatever inside information the executives of General Electric acted upon in September, 1960. It is unlikely that the five net buyers of this stock foresaw the price-fixing scandal of late 1960, within the subsequent six-month period. General Electric and others were convicted of violating the antitrust laws in the sale of heavy electrical equipment; General Electric stock declined from a high of 80 to a low of 60 after the scandal broke.

EXHIBIT 6-2

PERFORMANCE OF FORECASTS AT MONTHLY PEAKS OF BUYING AND SELLING
IN STOCKS WITH THREE OR MORE NET BUYERS AND NET SELLERS OVER SIX MONTHS

Co. No.	Peak Buying (+) or Selling (-)		Adjusted Price		Direction of Market During Six Month Lag	% Gain (+) or Loss (-) Relative to the Market
	Month and Year	Intensity of Monthly Activity	At Peaks	Six Months Later		
4	Apr., 1958	+4	\$16.00	\$24.62	+	+33.5s
4	Apr., 1959	-7	31.75	26.37	-	-15.2s
15	Oct., 1957	+3	22.00	25.78	+	+12.0s
15	Oct., 1958	-3	36.47	37.86	+	- 8.6s
30	Sep., 1957	+5	64.75	61.37	-	+ 1.6s
30	Mar., 1959	-7	83.50	76.50	-	- 6.4s
30	Sep., 1959	+5	76.50	88.12	-	+18.3s
30	Sep., 1960	+5	78.25	67.50	+	-30.2u
32	Feb., 1957	+4	22.59	27.19	+	+14.9s
32	Mar., 1960	-3	65.50	51.62	-	-20.1s
40	Dec., 1958	+4	60.75	76.75	+	+19.4s
40	Apr., 1960	-3	40.00	40.50	-	+ 4.6u
87	Dec., 1959	+6	46.75	56.25	-	+25.7s
87	Aug., 1960	-4	61.00	76.00	+	+16.0u
95	Mar., 1957	+4	4.75	4.87	+	+ .6s
95	Nov., 1958	-3	9.37	9.12	+	-11.7s
95	July, 1960	-3	12.25	12.00	+	- 7.5s

s = successful forecast; u = failure to forecast (unsuccessful)

Six of the eight forecasts of decline were successful in terms of the model. One of the two unsuccessful performances did predict the general market trend, but was not similarly successful in forecasting the value of its own stock--it advanced a half of a point during the decline in the market. In general, this method of selection, based on the cyclical nature of the executive trading in some companies, gave highly successful results. Fourteen successes out of 17 forecasts (82.3 per cent) is strong evidence for the validity of the alternative hypothesis introduced in this chapter--that insider trading predicts market trends in companies which tolerate (and possibly encourage) trading by executives.

CHAPTER VII

CONCLUSIONS AND IMPLICATIONS

The purpose of this study was to ascertain the predictive property of a phenomenon which seemed reasonably likely to forecast stock price movements. A hypothesis that insiders forecast through their transactions the market price of their own company's common stock was tested by studying insider trading in a random sample of corporations listed on the New York Stock Exchange. There were 100 common stocks randomly drawn from a population of approximately 1,065 such stocks during 1957-1960. Of the 100, only 98 reported instances of insider trading.

Having defined the scope of the investigation, brief summaries of empirical and legal background material were provided. A search of the literature did not discover a similar statistical study.

A model was derived to test the hypothesis. It was contended that the behavioral assumption that executives attempt to maximize profits is reasonable for company officials as an aggregated class. Rules were established for collecting and summarizing the raw data, and the tests were

limited to short-run forecasts defined as six months. The method chosen was to construct an insiders' transactions index for each company for each month, and to analyze the monthly values in this index (other than zero) with an index of that stock's performance during the subsequent six-month period. The index of monthly company activity was the number of its own buyers minus the number of its own sellers. The index of a stock's performance was its percentage of change minus the percentage of change in the Securities and Exchange Commission's composite stock price index over six-month intervals from the date of the insider buying or selling. Thus the hypothesis, in general, tested whether inside-buying led a six-month advance greater than the general market movement, and whether inside-selling led a six-month decline relative to the market.

There were 1,507 monthly observations divided about equally between buying and selling transactions in the stocks of the 98 companies. While the average frequency of trading activity was 16 observations per company or four per year, the activity among the companies ranged from one to 39 out of the 48 months studied.

It appears that the greater the disproportion of monthly buyers over sellers in a stock, the more likely it is to out-perform or under-perform the market in the ensuing

six-month period, and the rates of advance or decline, relative to the market, tend to increase with this monthly proportion of net transactors. However, the low average correlation of +0.13 in 48 monthly composite tests suggests a weak relationship. On the other hand, the sign of the correlation coefficient is probably positive. A sign test suggests that if there were no relationship between the two variables (indices of insider-monthly-activity and a stock's performance relative to the market during the next six months), the chance is one in 100,000 that there would be this many or more positive correlations.

The analysis of the performance of insider-bought and insider-sold stocks suggests that insiders' buying and selling transactions are associated with the respective advances and declines in the stock-prices, as related to the market averages over six-month intervals. A company's stock bought by two or more of its executives in a month advanced relative to the market two out of three times on the average. Insider-sold stock declined below the market average more frequently than otherwise, but the ratio of successful forecasts to the total was not as strong as that of the insider-bought stocks. The insider-sold stocks had a poorer record of successful forecasting than the insider-

bought stocks by 4.35 per cent on the average. The possibility that these average differences were due to chance alone is much less than one in a hundred.

Summary of Statistical Tests

1. In order to test the hypothesis that insiders forecast through their transactions the market price of their own company's common stock, the statistical null hypothesis of no relationship was rejected at the .00001 level.
2. The average performance of the stocks forecast to increase was +4.45 per cent greater than the average common stock equities listed on the New York Stock Exchange. The average performance of those stocks forecast to decline was also +1.62 per cent better-than-average. Statistically, these two means from large samples were significantly different at the .01 level.
3. Despite the positive means of the stocks forecast to decline, a chi-square test found that the net buying and selling transactions were significant predictors of direction.
4. An individual insider's transaction in a month not reinforced by another executive's similar transaction in the stock that month was not a good predictor at the .01

level of significance.

5. A stock sold by executives is more likely to decline than advance relative to the market. However, the probability of a stock advancing following net purchases is greater than the probability of a stock declining following net sales.

6. Stocks bought and sold by three or more insiders in a month had mean semi-annual performance records and estimates of the standard error of the mean percentages that were significantly consistent with the hypothesis stated in item 1 above.

7. The analysis of the forecasting records of the individual executive groups revealed that some groups were highly successful, and some were equally unsuccessful. There were approximately two and a half very successful individual records for every equally unsuccessful record.

8. Although over-all correlations were not strong, there is a good indication that insider-stock transactions in companies that tolerate such trading by their executives have positive predictive value. It seems probable that a random selection of companies which encourage or tolerate insider buying and selling would yield a stronger relationship between transactions and eventual trend.

The results of the statistical tests suggest that insiders do forecast the price of their company's stock relative to the market six months later. Despite convincing evidence supporting the validity of this hypothesis, the variation is nevertheless large and the expected or average gain from insiders' transactions is relatively small. Thus, in the sense that the risk of failure to forecast remains relatively high, the relationship is not strong.¹

The remaining pages contain various suppositions whose validity will require further testing.

Implications

Macro-economics

If valid, the hypothesis of this thesis was presumed to have an economic significance. While this study has produced evidence to support the proposition that insiders' transactions forecast their company's stock price, it has not demonstrated the economic significance of the reported data and hence the economic utility of the Official Summary publication.

The evidence has not led to the rejection of the

¹"Relationship" refers to both the rate of change as a function of the net number of transactors and, the more general relationship of the direction of change as a function of net buying or selling.

plausible theory that the men who run American corporations may be the first to know what is ahead for the nation's publicly-held companies. But there is ample reason to believe that the relationship between their transactions in their company's stock and that stock's price performance in the short run (six-month future) is not strong. Thus, the likelihood of converting the information on insiders' transactions into a useful economic indicator is sharply reduced.

Business expectations.--The value of the Official Summary in forecasting may be conceived as a survey of general business expectations. Direct surveys of business expectations have value because they provide good estimates of psychological attitudes. A survey of current capital budgeting estimates would be useful. The expectations of businessmen are in part responsible for the decisions they make. For example, asking the executives of American corporations what they think is the most favorable geographical region for locating a new plant would provide some basis for predicting the regions the corporations will select for new plant construction.

However, direct surveys of business anticipations have several disadvantages. First, they are costly. Second, they take too long to compile for current forecasting

purposes. Third, the responses may be biased. On the other hand, the Official Summary might be considered an indirect survey of businessmen's expectations. The data published by the SEC is inexpensive and promptly available. The disadvantage is that expectations, like motivations, must be inferred.

This study suggests that inside-buying by two or more executives reveals optimistic expectations. Inside selling by less than three insiders probably does not warrant an inference that these businessmen have pessimistic expectations. On the other hand, intensive inside selling by three or more insiders probably reveals a negative outlook and a signal for worse-than-average performance of their company's stock in the future. This study suggests that these cases of intensive monthly net buying and selling occur infrequently.

Average performance.--Despite the large variation, this dispersion may not present a serious problem for uses and users to which measures of aggregate economic values are essential. Consequently, the average relationship among the stocks studied, although not central to this thesis, provides a concise summary of the linear model. The "average" stock has an intercept of +3.1 per cent and a regression

coefficient (or slope) of +1.24 per cent per net transactor.

It was estimated that the average performance in observations showing a zero number of net monthly transactors is about +3.1 per cent relative to the market over six-month periods. This is the average of the least significant sample of 1,135 cases showing either one net buyer or one net seller. Possibly the 3,293 (4,800 minus 1,507) observations which showed no activity in a stock during a month, if tested, would have performed, on the average, about 3 per cent better than the market as a whole. At first, this estimate of a positive 3 per cent for the average intercept of the sample seemed likely to be the extent of the positive bias. Subsequent calculations, however, suggest that this is probably due to the chance variation of the selected companies among all companies listed on the New York Stock Exchange.

The average price of the 100 stocks in the random sample (including the two for which no transactions were observed) advanced 51.2 per cent from January, 1957 to June, 1961. During this same four and one-half year period, the SEC stock average advanced 48.4 per cent.² Thus, the

²While it appears that chance led to a sample which out-performed the market, it should be noted that during this four and one-half year period 19 out of 100 stocks were at lower prices at the end of this bullish period compared

selected stocks out-performed the selected index of the market by 2.8 per cent. This variation appears to explain much of the intercept of +3.1 per cent.

Discussion of aggregates.--Focusing attention on the performance of the individual stocks rather than the average performance of monthly samples has provided a clearer indication of the extent of the variation among stocks. This variation would probably have been obscured in a study of aggregates.³ It is intuitively expected that the variation in a stock's price will generally exceed the variation in an aggregate measure of many such stocks because of the cancelling effect of the variation among the components in an average. In other words, once a stock makes a significant move, up or down, the extent of its price change is probably greater than that of the market change during the

to their prices in January of 1957. These prices are adjusted for stock-splits and stock dividends, and the fact that 19 per cent of the sample declined in dollar value during a general stock market advance of 48.4 per cent, is convincing evidence that the stock-market is really a market of stocks.

³While both the average and median correlation were found to be +0.13, the correlation between the 96 monthly average net buying and net selling indices and their stocks' average performance six months later (i.e. aggregates not included in the discussion in the text) was calculated to be higher, or +0.25.

same period, and a successful forecast will probably remain successful whether the performance measure is deflated or not. More often than not, intensive buying or selling by insiders signal these important price movements.

Support for this idea can be seen in Appendix K, a comparison of the relative-performance measure (used in this study) with dollar-performance measure in a random sample of monthly trading by two or more net transactors.

In view of the general market behavior of the period 1957-1960, the result is not surprising for the cases of net buying, but it is somewhat curious in the cases of net selling. For example, Appendix K shows that all seven months in which there was net selling by six or more corporate insiders preceded by six months dollar declines (not deflated) as well as percentage declines deflated for the market trend. Admittedly, the sample of net selling by six or more insiders is small; nevertheless, the evidence suggests that the hypothesis that net monthly selling by many insiders forecasts a downturn in the price of that stock is reasonable.

The evidence in Appendix K, showing dollar performance, does favor net buying. However, when the general advance of the market over the whole period is considered, the advantage of buying is not as apparent in the figures

as might have been expected. Generally, the ratios of deflated successes to total observations closely parallel the ratios of undeflated (or dollar-performance) successes to total observations by transaction-index-number, the ratios tending to get smaller in both models as the intensity of the monthly trading activity diminishes.

An aggregate leading indicator.--The possibility that insiders' transactions could be used as an aggregate leading indicator of the market as a whole is still a real one. In order to base an index on this theory, there would have to be more companies which encourage their executives to engage freely in inside trading. If insiders' transactions do lead the market, a more selective sample should have a superior forecasting performance and a moving average of the monthly transactions (or smoothing an aggregate index and its inherent delay or lag) might not be needed.

Future study must determine if an insiders' transactions index reliably foreshadows the cyclical changes in the market. The evidence presented in this study suggests that a random sample will probably provide more false leads than a more selective sample based on intensive insider trading in companies that permit buying and tolerate selling by their executives. This study also suggests that it is

probably a good idea to construct an insiders' transactions index that takes into account the net number of transactors.

Causes and conjectures.--The positive relationship between insiders' transactions and a stock's price behavior in the market seems unlikely to result from pure chance. While the identity of causative factors must await further study, several possibilities should be noted.

A change in stock prices is never the result of a single cause but of a complex of causes which constantly vary in intensity and of which only a part can be adequately measured by statistics. Chronology does not imply causality. It is possible for insiders' transactions to occur in advance of an economic change without being one of the causes of the event. The observed success in forecasting may result from the officials' inside information, their skill in determining whether publicly-known events will affect their company's future favorably or unfavorably, or from some other cause. For example, it is a well-known stock-market phenomenon that initial activity generates additional activity in the direction of the initial change in prices.⁴

⁴Friend, Brown, Herman, and Vickers, A Study of Mutual Funds, p. 359. See also Securities and Exchange

The volume of shares traded by the insiders was found to be an insignificant part of the total shares traded during the month. Even if the volume of the insiders' transactions had no significant influence on the stock price as the evidence suggests, it is still possible that the observed correlation may be systematic. For example, one possible explanation is that in their transactions the insiders may themselves cause the fulfillment of their own expectations. This would not happen because of the volume of their transactions or because of any inside knowledge they might have of a share's worth. Rather, the volume precipitated by the insiders' transactions is probably the influence which sends the stock price in the predicted direction.

If the six-month interval is arbitrarily divided into three equal parts, the effect of the increase in volume hypothesized to result from others' following the lead of the insiders, whether knowingly or unknowingly, could be causally related to the observed success in forecasting. For example, it is reasonable to believe that there is some trickle of unreported volume associated with

the transactions of friends and relatives of the insiders. The insider's broker knows of these transactions before they are publicly disclosed. He has other customers and frequently recommends to them "favored stocks" on some basis which may well include his knowledge of the insider's views.

During the second two months, public disclosure may stir up additional demand or supply. A substantial and growing number of citizens subscribes to the stock exchange releases and the later but more detailed Official Summary publication. The articles regularly appearing in the financial press strongly suggest that the insiders' transactions may have a large market following. Some investment advisors have prospered on the empirically plausible but possibly fallacious assumption that insiders trade on the basis of important and confidential information.

The hypothesis that a change in price may result from shifts in demand or supply during the first four months may be reasonable. If the section of the trading public which follows the insiders' transactions acts in such a way as to have an effect on the price in the hypothesized direction, it is probable that this will be noted by speculators. There is evidence that a significantly large number of stock-traders follows price and volume movements at the technical level. The investment behavior of chartists could

have a snow-ball effect tending to produce the observed correlation.

If these supposed relationships and feedbacks are strong enough to cause price changes, the economic significance of the relationship may be useless or short-lived. In other words, if insiders do not act on the basis of confidential knowledge, there may be no correlation between the insiders' transactions and their company's trend in earnings or dividends.

These are questions that require further study and analysis. In sum, successful forecasts in the aggregate may be due to the official's inside knowledge, superior investment skill in general, or something else. This thesis has only shown that the forecasting relationship is probably not due to chance alone.

Social and behavioral

For many years there has been a difference of opinion about the usefulness of reported stock transactions of corporate officials as an investment guide. Most of the claims on each side have come from investment services in their effort to explain the inclusion or exclusion of the information in their reports. Most of the claims, however, have been based upon limited observation, and on neither

side has convincing experimental evidence supported the contentions.

Basic to the claim that insiders' transactions are useful as an investment guide is the assumption that key corporate officials are expert forecasters of their company's stock price for two reasons: they have important "inside" information, and they are profit maximizers not hampered in this pursuit by law or corporate policy. The arguments supporting the contention that the reported stock transactions are useless for forecasting purposes include the notion that insiders have various motives when they buy or sell their company's stock, and that since insiders are not investment analysts, their judgment of the merits of a stock is distorted by their involvement in its destiny.

Whether either set of assumptions is valid is irrelevant, for this study does not directly test the usefulness of the reported data as an investment tool. Nevertheless, the evidence seems to support the first set of assumptions (basic to the hypothesis of the study) that there is some utility in the reported insiders' transactions --providing, of course, that the inferred favorable or adverse information (on which the insiders trade) is not discounted in the market price during the one-to-two month

lag between the insiders' transactions and their public disclosure.

Forecasting for profit.--A second closely related implication deduced from the evidence (and not inconsistent with the hypothesis) is that insiders do enjoy an edge in trading. However, testing the ability of insiders' transactions to forecast for profit was not the purpose of this study. For this reason such factors as taxes, commissions, lags, and cash dividends have been ignored. Nevertheless, if forecasting properties exist, their use in stock-market strategies should be possible. The weak relationship between insiders' transactions and the market trend found in this study casts some doubt on the notion that insiders' transactions can be used as an investment guide. The great risk of making an incorrect decision would be compounded by the increased trading costs attendant on frequent turnover.

On the other hand, if greater selectivity of sample reveals a stronger relationship, it is possible that the application of quantitative rules could improve portfolio allocations and the performance of the average diversified portfolio. Perhaps such a relationship could be converted into some kind of timing formula that, in addition to minimizing the investor's subjective reactions to current

events, would enable him to avoid the emotional errors of others. At least, analysis of insiders' transactions might encourage further investigation of securities where there is a large net number of buyers and sellers.

Security analysis

Brokerage house analysts, advisory services and other security analysts frequently select and recommend common stocks whose situation seems to favor a near-term market advance. The usual assumption is that if earnings increase or the dividend is raised, the price will improve. Thus, the process consists essentially of locating and recommending companies likely to increase their earnings or dividends in the near term.

The hazards inherent in the method are that the expected improvement does not take place, that it is already discounted in the current price, and that for some other reason or for no known reason the price does not move as anticipated.

Diversification and aggregate results.--Because of these hazards, diversification is a principle of sound investment, and investors are encouraged to diversify their holdings. In spite of these hazards it may be possible to obtain worthwhile results on the average from competent

short-term analyses and predictions.

Benjamin Graham suggests that there are similarities between the predictions of the life insurance actuary and those of the security analyst, noting that "diversification is of the essence in actuarial science."

The life insurance actuary makes predictions . . . based on . . . carefully analyzed past experience. . . . Out of these predictions, with the aid of mathematical techniques, he fashions suitable premium schedules for various types of insurance. What is most important for us about his work and his conclusions is that he deals not with individual cases but with the probable aggregate result of a large number of similar cases.⁵

Graham concludes the analogy by saying that security analysis would benefit from the use of established statistical tools to investigate the "successful" approach to stock market forecasting:⁶

We should collect the studies and recommendations of numerous analysts, classify them in accordance with their objectives . . . and then do our best to evaluate their accuracy and success. The purpose of such a record would not be to show who is a good security analyst and who is a poor one, but rather to show what methods and approaches are sound and fruitful and which ones fail to meet the test of experience. . . . In view of the importance of this analytical work, in terms of time, energy, and money cost, it might not be

⁵Benjamin Graham, "Towards a Science of Security Analysis," Financial Analysts Journal, VIII (August, 1952), 97.

⁶Ibid., p. 99.

a bad idea to subject it to a thorough-going evaluation.⁷

The analogy is probably weak because of the greater number of psychological variables in the field of investments compared to that in actuarial science. Nevertheless, the point is clear: the statistical limitations of heterogeneity (among companies), non-randomness (among insiders' transactions), and interdependence (among internal and external events), for example, are not insurmountable barriers to a more scientific approach to the study of security prices.

⁷Ibid.

A P P E N D I X E S

A P P E N D I X A

FREQUENCY AND NUMBER OF NET BUYERS AND SELLERS
IN THE MONTHLY INSIDERS' TRANSACTIONS INDICES,
BY COMPANY, DURING 1957-1960

APPENDIX A

FREQUENCY AND NUMBER OF NET BUYERS AND SELLERS IN THE MONTHLY INSIDERS' TRANSACTIONS INDICES, BY COMPANY, DURING 1957-1960

Code No.	Company	Frequency		Peak No.	
		Buying	Selling	Buyers	Sellers
1 ^a	Aldens, Inc.	8	6	4	2
2	Central Illinois Light	3	0	1	0
3	Allied Laboratories	7	11	1	2
4 ^a	American Airlines	15	10	4	7
5	American Investment	2	14	1	5
6	American Machine and Metals	14	2	3	1
7	American Molasses Company	6	3	1	1
8	American News Company	15	2	2	1
9	American Water Works	19	4	4	1
10	Barker Bros. Corporation	7	5	1	2
11 ^a	Beech Aircraft	5	9	2	3
12	Brooklyn Union Gas Company	4	1	2	1
13	Buckeye Pipeline Company	1	1	1	1
14	Central Ill. Public Service	2	1	2	1
15 ^a	Cerro de Pasco Corporation	12	3	3	3
16	Chicago Rock Island & Pacific	7	4	1	1
17 ^a	American Metal Climax	5	11	2	6
18	Colorado Fuel and Iron	8	8	2	1
19 ^a	Commercial Credit	14	16	2	2
20 ^a	Consolidated Electrodynamics	5	18	2	4
21 ^a	Consolidated Gas Utilities	5	7	2	2

APPENDIX A--Continued

Code No.	Company	Frequency		Peak No.	
		Buying	Selling	Buyers	Sellers
22 ^a	Dover Corporation	6	12	3	2
23	Ekco Products Company	12	10	7	1
24	Federated Department Stores	1	31	1	4
25	Fifth Avenue Coach Lines	10	2	3	1
26	Gar Wood Industries	7	2	1	1
27 ^a	General American Oil of Texas	11	11	7	2
28 ^a	General Cable Corporation	7	13	2	3
29 ^a	General Dynamics Corporation	5	32	2	7
30 ^a	General Electric	18	20	5	7
31	General Precision Equipment	5	18	1	3
32 ^a	General Tire and Rubber Co.	8	15	4	3
33 ^a	Georgia Pacific Corporation	12	9	3	2
34	Grayson-Robinson Stores, Inc.	0	8	0	3
35	Great Western Sugar Company	1	1	1	1
36	Heller (Walter E.) and Company	2	22	1	2
37	Hercules Motor Corporation	5	1	2	1
38	Hoffman Electronics Corporation	2	12	1	2
39	Hussman Refrigerator	11	2	4	1
40 ^a	International Tel. and Tel.	13	15	4	3
41	Iowa Illinois Gas and Electric	7	0	3	0
42	Kansas Gas and Electric	9	0	1	0
43	Kimberly Clark Corporation	3	21	1	2
44	Lane Bryant, Inc.	4	1	2	1

APPENDIX A--Continued

Code No.	Company	Frequency		Peak No.	
		Buying	Selling	Buyers	Sellers
45	Lehman Corporation	4	0	2	0
46 ^a	Lerner Stores Corporation	20	5	2	2
47	Liggett and Myers Corporation	0	17	0	4
48	McCrorry Stores Corporation	8	3	1	1
49	Mercantile Stores Co., Inc.	5	7	2	1
50	Midland Steel Products Company	13	0	2	0
51	Midwest Oil Corporation	4	9	1	1
52	Minnesota and Ontario Paper	12	0	1	0
53	Monsanto Chemical Corporation	5	18	1	4
54	Monterey Oil Company	7	5	2	1
55	Myers (F. E.) and Bros. Co.	2	3	1	3
56 ^a	National Distillers & Chemical	12	7	2	2
57	National Lead Company	1	10	1	2
58	National Tea Company	4	5	1	1
59	Newberry (J. J.) Company	10	5	7	1
60 ^a	North American Aviation	4	10	2	9
61 ^a	Northrop Aircraft	7	13	2	2
62	Overland Corporation	2	0	1	0
63 ^a	Paramount Pictures Corporation	3	7	2	2
64	Parmelee Transportation Co.	1	6	1	1
65	Patino Mines and Enterprises	1	0	1	0
66	Pennsylvania Glass Sand Corp.	4	0	2	0
67 ^a	Pennsylvania Power and Light	4	7	2	3

APPENDIX A--Continued

Code No.	Company	Frequency		Peak No.	
		Buying	Selling	Buyers	Sellers
68	Philadelphia and Reading Corp.	4	13	1	2
69	Phillips Petroleum	6	10	1	2
70	Public Service Co. of Indiana	2	1	1	1
71 ^a	Publicker Industries, Inc.	5	34	2	3
72	Real Silk Hosiery Mills, Inc.	0	10	0	2
73	Reynolds Metals Company	2	17	1	1
74	Rhodesian Selection Trust Ltd.	0	0	0	0
75	St. Joseph Light and Power	6	1	2	1
76	San Diego Gas and Electric	15	2	3	1
77 ^a	Seaboard Airline Railroad	3	16	2	3
78	Sears Roebuck and Company	21	5	5	1
79	Smith (A. O.) Corporation	1	4	1	1
80	South American Gold & Platinum	11	3	2	1
81	Spencer Kellogg and Sons	13	1	2	1
82	Starrett (L. S.) Company	26	0	4	0
83	Stewart and Warner	3	9	1	2
84	Stix Baer and Fuller Company	0	11	0	3
85	Storer Broadcasting Company	3	1	1	1
86 ^a	Sunray Mid-Continent Oil	11	10	2	3
87 ^a	Talcott (James), Inc.	22	9	6	4
88 ^a	Tennessee Corporation	10	3	4	2
89 ^a	Twentieth-Century Fox Films	6	12	2	2
90 ^a	Twin City Rapid Transit	16	1	3	2
91 ^a	Union Chemical and Materials	11	11	3	2

APPENDIX A--Continued

Code No.	Company	Frequency		Peak No.	
		Buying	Selling	Buyers	Sellers
92 ^a	United Biscuit of America	6	8	2	2
93	United Engineering & Foundry	8	3	1	1
94	U. S. Playing Card Company	3	1	1	1
95 ^a	United Cigar Whelan Stores	10	4	4	3
96 ^a	Van Norman Industries	21	10	2	3
97	Van Raalte Company, Inc.	11	10	2	1
98	Western Pacific Railroad Co.	13	2	2	1
99	Wheeling and Lake Erie Ry. Co.	0	0	0	0
100	White Motor Company	6	23	1	2

^aCompany in 33-company selected sample.

A P P E N D I X B

DATES OF MONTHLY OBSERVATIONS OF STOCK PRICES

APPENDIX B

DATES OF MONTHLY OBSERVATIONS OF STOCK PRICES

The prices of the stocks and the level of the SEC Composite Index were recorded as of the close of trading on the following dates:

n	Date	n	Date	n	Date
1	1-18-57	19	7-18-58	37	1-15-60
2	2-15-57	20	8-15-58	38	2-12-60
3	3-15-57	21	9-12-58	39	3-18-60
4	4-18-57	22	10-17-58	40	4-14-60
5	5-17-57	23	11-14-58	41	5-13-60
6	6-14-57	24	12-12-58	42	6-17-60
7	7-12-57	25	1-16-59	43	7-15-60
8	8-16-57	26	2-13-59	44	8-12-60
9	9-13-57	27	3-13-59	45	9-16-60
10	10-18-57	28	4-17-59	46	10-14-60
11	11-15-57	29	5-15-59	47	11-18-60
12	12-13-57	30	6-12-59	48	12-16-60
13	1-17-58	31	7-17-59	49	1-13-61
14	2-14-58	32	8-14-59	50	2-17-61
15	3-14-58	33	9-18-59	51	3-17-61
16	4-18-58	34	10-16-59	52	4-14-61
17	5-16-58	35	11-13-59	53	5-12-61
18	6-13-58	36	12-18-59	54	6-16-61

A P P E N D I X C

INSIDERS' TRANSACTIONS: RULES FOR INCLUSION

APPENDIX C

INSIDERS' TRANSACTIONS: RULES FOR INCLUSION

The rules adopted in this study for the collection of the insider transaction data are presented below. Explanations are offered in the Discussion section following the list of rules where the reason for the rule is not obvious.

Rules for Inclusion

1. Examine only insider transactions in the 100 common stocks of the companies that make up the sample.
2. Include officers, directors and beneficial owners other than corporations.
3. Exclude trustee or voting-trustee transactions unless the person was also either an officer, director or beneficial owner.
4. Exclude bequests or inheritances.
5. Exclude compensation or bonuses.
6. Do not include other forms of distribution of shares by or to corporate officials.
7. Do not include exchange or conversion, exercise of rights, etc., or gifts.

8. Do not include redeemed, called, matured or retired transactions.
9. Do not include stock dividends or stock splits.
10. Do not include transferred or accrued transactions.
11. Do not include stock-option purchases or shares otherwise acquired through the exercise of option agreements.
12. Do not include private transactions not completed in the open market.

All other transactions, no matter what the nature of the insider's ownership, were included. Thus, transactions by insiders' wives were included, as were transactions of securities, whether beneficially owned or not, made indirectly through a holding company, partnership, trust or other form of intermediary. Also included were transactions made and held directly by the insider, but which he disclaimed as not being the beneficial owner of the securities.

Discussion of Rules

As noted above, rules are discussed only where reasons for their formulation are not immediately obvious.

No. 2. The transactions of beneficial owners, other than corporations, were included. Individual large shareholders and investment companies were included because it

was assumed that they may have more information than some of the directors. On the other hand, some industrial, rail and utility corporations may either consistently add to their holding month after month or dispose of their entire beneficial interest at one time. Corporations were excepted from this beneficial owner inclusion rule on the assumption that they were in the process of changing their complex of subsidiaries, and that this long-run goal negated the rationale of assigning short-run forecasting properties to these transactions. As the data later revealed, these corporate transactions were infrequent. When they did occur, the purchases were in lots that were small in relation to the prior month's holdings. The sales transactions usually consisted of the entire beneficial interest.

No. 13. Private transactions not completed in the open market were excluded because meaningful price data were not available.

A P P E N D I X D

SEC RULE 16a-9

(EXEMPTION FOR SMALL TRANSACTIONS)

APPENDIX D

SEC RULE 16a-9

(EXEMPTION FOR SMALL TRANSACTIONS)

Under the authority contained in Section 3(a)(12) of the Securities Exchange Act of 1934, the Commission has adopted rules exempting certain securities or transactions from the provisions of Section 16(a). One of these rules is of sufficient importance to this study to warrant its presentation. Since this study will derive an insiders' transactions index based on the number of buyers less the number of sellers, ignoring the quantity of the transaction, it is important to establish the fact that the small transaction is exempted from the reporting requirements. Thus the reported transactions individually exceed \$3,000 and are for the most part material in dollar amount. Rule 16a-9 exempting small transactions from disclosure states:

- (a) Any acquisition of securities shall be exempt from Section 16(a) where--
 - (1) the person effecting the acquisition does not within six months thereafter effect any disposition, otherwise than by way of gift, of securities of the same class, and
 - (2) the person effecting such acquisition does not

participate in acquisitions or in dispositions of securities of the same class having a total market value in excess of \$3,000 for any six months period during which the acquisitions occur.

- (b) Any acquisition or disposition of securities by way of gift, where the total amount of such gifts does not exceed \$3,000 in market value for any six month period, shall be exempt from Section 16(a) and may be excluded from the computations prescribed in paragraph (a)(2).
- (c) Any person exempted by paragraph (a) or (b) of this rule shall include in the first report filed by him after a transaction within the exemption a statement showing his acquisitions and dispositions for each six month period or portion thereof which has elapsed since his last filing.

A P P E N D I X E

ILLUSTRATION OF DATA SUMMARIZATION:

ALDENS, INC.

APPENDIX E

ILLUSTRATION OF DATA SUMMARIZATION:

ALDENS, INC.

The mechanics of collecting and compressing the raw data as outlined in Chapter IV are illustrated in this Appendix. Table E-1 shows the transactions of four selected months after filtering in accordance with the rules of inclusion and exclusion. Table E-2 reveals the monthly indices of transaction activity (x) and stock-price performance (y) for this series as well as the continuous stock price series. Table E-3 illustrates one computation of the index of a stock's performance (y) from Table E-2.

TABLE E-1

ALDENS, INC.
INSIDERS' TRANSACTIONS OF SELECTED MONTHS
1957-1959

Date	Official Reporting	Beginning Month Holdings of Shares Traded	Shares Purchased at Market	Shares Sold	Insiders' Trans. Index
Oct., 1957	G. R. Cox	127	200		+4
	J. C. Staehle	1,100	200		
	H. J. Stentiford	703	300		
	G. R. Worley	117	100		
Dec., 1957	Josephine Gross	0	100		+1
Dec., 1958	G. P. Madigan	165	100		+1
	G. R. Worley	217	100		
	E. H. Rosenthal	18,805		500	
May, 1959	J. C. Staehle	1,938	100		0
	H. J. Stentiford	510		100	

TABLE E-2

ALDENS, INC.
 FOUR YEAR SUMMARY OF INSIDERS' TRANSACTIONS,
 STOCK PRICE AND ADJUSTED STOCK PRICE
 FOR THE FOUR AND ONE-HALF YEARS
 ENDING JUNE 16, 1961

Year	Month	Code t _n	Insiders' Trans. Index	Unadjusted Stock Price	Adjusted Stock Price	Stock Perfor- mance Index ^a
1957	J	1	+1	\$16.875	\$15.298	-.0721
	F	2	0	17.250	15.638	
	M	3	0	17.000	15.411	
	A	4	0	17.125	15.524	
	M	5	0	18.000	16.318	
	J	6	0	17.375	15.751	
	J	7	0	17.375	15.751	
	A	8	0	16.750	15.184	
	S	9	0	16.875	15.298	
	O	10	+4	15.375	13.938	+.2822
	N	11	0	15.750	14.278	
	D	12	+1	15.000	13.598	+.1673
1958	J	13	0	15.875	14.391	
	F	14	0	17.250	15.638	
	M	15	0	18.000	16.318	
	A	16	0	20.500	18.584	
	M	17	-1	20.250	18.357	-.1805
	J	18	-1	19.000	17.224	+.1045
	J	19	0	19.000	17.224	
	A	20	0	19.250	17.451	

TABLE E-2--Continued

Year	Month	Code tn	Insiders' Trans. Index	Unadjusted Stock Price	Adjusted Stock Price	Stock Perfor- mance Index ^a
1958	S	21	0	\$19.500	\$17.677	
	O	22	0	20.625	18.697	
	N	23	+1	21.125	19.150	+ .4606
	D	24	+1	23.875	22.076	+ .1451
1959	J	25	0	24.250	22.423	
	F	26	+2	24.000	22.191	+ .4650
	M	27	0	29.250	27.046	
	A	28	-1	32.125	29.704	+ .3165
	M	29	0	32.125	29.704	
	J	30	0	29.000	26.815	
	J	31	+1	33.750	31.207	+ .4562
	A	32	0	37.125	34.327	
	S	33	0	37.250	34.443	
	O	34	-1	41.750	38.604	+ .1276
	N	35	0	43.625	40.338	
	D	36	-2	51.375	48.929	- .0220
	J	37	-2	47.250	45.000	+ .1071
	F	38	0	44.000	41.905	
	M	39	+1	43.875	41.786	+ .1162
	A	40	0	44.375	42.262	
1960	M	41	0	47.250	45.000	
	J	42	0	47.500	45.238	
	J	43	0	49.500	47.143	
	A	44	0	50.500	48.095	

TABLE E-2--Continued

Year	Month	Code tn	Insiders' Trans. Index	Unadjusted Stock Price	Adjusted Stock Price	Stock Perfor- mance Index ^a
1960	S	45	0	\$48.500	\$46.190	
	O	46	0	49.875	47.500	
	N	47	0	47.625	45.375	
	D	48	0	50.500	50.500	
1961	J	49	N.A.	55.000	55.000	
	F	50	N.A.	58.000	58.000	
	M	51	N.A.	69.750	69.750	
	A	52	N.A.	85.250	85.250	
	M	53	N.A.	75.250	75.250	
	J	54	N.A.	67.750	67.750	

The stock price series is adjusted for the following:

<u>Stock Dividend</u>	<u>Ex-Dividend Date</u>	<u>Amount</u>
1957		None
1958	12-4-58	2%
1959	12-4-59	3%
1960	12-6-60	5%
1961		None

^aFor computation illustration see Table E-3.

TABLE E-3

JANUARY, 1957 NET BUYING FORECASTING
RELATIVE PRICE INCREASE AS OF JULY, 1957

Company Code No.	Stock Price			Index %Δ	Stock Perfor- mance Index	Insiders' Trans. Index
	t ₁	t ₇	%Δ			
001	15.298	15.751	+.0296	+.1017	-.0721	+1
009	9.250	10.875	+.1757	+.1017	+.0740	+2
019	46.625	46.750	+.0027	+.1017	-.0990	+2
024	28.000	31.000	+.1071	+.1017	+.0054	+1

JANUARY, 1957 NET SELLING FORECASTING
RELATIVE PRICE DECLINE AS OF JULY, 1957

Company Code No.	Stock Price			Index %Δ	Stock Perfor- mance Index	Insiders' Trans. Index
	t ₁	t ₇	%Δ			
30	54.750	71.500	+.3059	+.1017	+.2042	-1
31	41.000	47.000	+.1463	+.1017	+.0446	-2
36	18.250	17.875	-.0205	+.1017	-.1222	-1
53	32.393	37.811	+.1673	+.1017	+.0656	-1

A P P E N D I X F

SIGN TEST ON FORTY-EIGHT MONTHLY
CORRELATION COEFFICIENTS

APPENDIX F

SIGN TEST ON FORTY-EIGHT MONTHLY CORRELATION COEFFICIENTS

Let:

P = the probability of a correlation coefficient
being positive

Q = the probability of a correlation coefficient
being negative

Ho: $P = Q = .5$

Ha: $P > Q$

Test N = 48

x = the number of positive correlation coefficients
= 40

By using a normal approximation (including a correction for continuity) one can calculate the probability of getting 40 or more positive correlation coefficients out of 48 when $P = .5$

$$z = \frac{(x + .5) - N P}{\sqrt{N P Q}} = 4.77$$

Thus, the probability of randomness is approximately .00001.

A P P E N D I X G

RANKING OF 83 COMPANIES BY CORRELATION
COEFFICIENTS BETWEEN THEIR INSIDERS'
TRANSACTIONS AND THE RELATIVE STOCK
PRICE LAGGED SIX MONTHS BASED ON
SIX OR MORE MONTHLY OBSERVATIONS
DURING 1957-1960

APPENDIX G

RANKING OF 83 COMPANIES BY CORRELATION

COEFFICIENTS BETWEEN THEIR INSIDERS'

TRANSACTIONS AND THE RELATIVE STOCK

PRICE LAGGED SIX MONTHS BASED ON

SIX OR MORE MONTHLY OBSERVATIONS

DURING 1957-1960

Company Code No. ¹	No. of Net Buying and Net Selling Observations	Correlation Coefficient ²
75	7	+ .8631 ^a
81	14	+ .7732 ^a
92	14	+ .6963 ^a
21	12	+ .6720 ^a
84	11	+ .6469 ^b
10	12	+ .6384 ^b
41	7	+ .6375
72	10	+ .6226 ^c
80	14	+ .6209 ^a
9	23	+ .5540 ^a
91	22	+ .5385 ^a
17	16	+ .5352 ^b
4	25	+ .5240 ^a
1	14	+ .4773 ^c
64	7	+ .4744
76	17	+ .4693 ^c

APPENDIX G--Continued

Company Code No.	No. of Net Buying and Net Selling Observations	Correlation Coefficient
49	12	+ .4688
34	8	+ .4257
46	25	+ .4156 ^c
60	14	+ .4098
28	20	+ .3871 ^c
50	13	+ .3848
22	18	+ .3805
73	19	+ .3732
16	11	+ .3493
30	38	+ .3455 ^c
67	11	+ .3260
100	29	+ .3095
27	22	+ .3043
38	14	+ .3005
93	11	+ .2901
48	11	+ .2718
39	13	+ .2377
20	23	+ .2351
96	31	+ .2200
58	9	+ .1971
53	23	+ .1961
98	15	+ .1933
33	21	+ .1769
15	15	+ .1721
88	13	+ .1631

APPENDIX G--Continued

Company Code No.	No. of Net Buying and Net Selling Observations	Correlation Coefficient
69	16	+.1553
95	14	+.1522
68	17	+.1502
71	39	+.1381
78	26	+.1338
86	21	+.1284
11	14	+.1203
47	17	+.1096
25	12	+.1069
5	16	+.1044
3	18	+.0859
23	22	+.0849
18	16	+.0775
6	16	+.0396
26	9	+.0294
51	13	+.0091
24	32	+.0066
82	26	+.0063
29	37	-.0066
83	12	-.0069
8	17	-.0094
40	28	-.0129
87	31	-.0225
90	17	-.0280
56	19	-.0512
77	19	-.0628

APPENDIX G--Continued

Company Code No.	No. of Net Buying and Net Selling Observations	Correlation Coefficient
19	30	-.0706
43	24	-.0773
97	21	-.1150
89	18	-.1216
59	15	-.1292
32	23	-.1423
36	24	-.1487
37	6	-.2241
54	12	-.2459
61	20	-.3126
63	10	-.3164
31	23	-.3929 ^c
7	9	-.4714
57	11	-.6272 ^b
42	9	-----3
52	12	-----3

¹See Appendix A.

²By definition we will call companies more successful, in this ranking, the larger the correlation coefficient. Thus, we can approximately identify the relatively more successful and least successful companies in terms of the correlation coefficients of a linear relationship. However, tables of statistical significance assume that the number of observations are completely independent. The correlations through time are not completely independent because of the overlap in the six month intervals of some of the observations. Thus statements of probability of a chance occurrence are not appropriate. Despite this limitation, the standard tables of statistical significance are useful for

identifying the relatively more consistent transactions in terms of a linear relationship. The companies identified as a, b, or c, are defined as successful (or unsuccessful) on the basis of a .05 level of significance. a = .01 level; b = .025 level; and c = .05 level.

³Two of the 83 series have an undefined correlation due to a zero variation in the number of buyers less sellers for each observation. The nine and 12 monthly observations in companies numbered 42 and 52 respectively were always one net buyer in each month.

A P P E N D I X H

SIGNIFICANCE TEST OF DIFFERENCE BETWEEN MEANS

APPENDIX H

SIGNIFICANCE TEST OF DIFFERENCE BETWEEN MEANS

The formula for this test when the means are drawn from large samples is:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

If t is > 1.96 or < -1.96 then the means are said to be significantly different at the .05 level. If t is > 2.58 or < -2.58 the means are significantly different at the .01 level.

$t = 3.042$ highly significant at the .01 level.

The formula used to compute the variance of the sample with one degree of freedom is:

$$s^2 = \frac{\Sigma Y^2 - \frac{(\Sigma Y)^2}{N}}{N - 1}$$

A P P E N D I X I

AVERAGE PERCENTAGE PERFORMANCE
OF INSIDERS' NET BUYING AND SELLING
BY COMPANY

APPENDIX I

AVERAGE PERCENTAGE PERFORMANCE OF INSIDERS' NET BUYING AND SELLING BY COMPANY

In this appendix the companies are ranked according to the average magnitude of success achieved by the insiders in buying and in selling. Each observation is the percentage change in the stock's price less the percentage change in the market over six month periods from the month of the insiders' net buying or net selling. The first table summarizes the 731 net buying observations and the second table presents the average results of the 776 net selling observations. Presumably, the plus sign exemplifies performance superior to the market and the minus sign denotes a poorer performance relative to the market.

TABLE I-1

AVERAGE PERCENTAGE PERFORMANCE
OF INSIDERS' NET BUYING BY COMPANY

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Buying	Mean Percentage of Relative Performance of the Insider-Bought Stock (Per Observation)
64	1	+64.65
73	2	+34.98
100	6	+33.84
68	4	+27.65
1	8	+25.26
21	5	+23.82
38	2	+23.30
92	6	+22.40
55	2	+18.76
42	9	+18.56
87	22	+15.77
14	2	+15.58
2	3	+13.04
9	19	+12.58
41	7	+11.94
88	10	+11.74
80	11	+10.57
32	8	+10.54
4	15	+10.20
11	5	+ 9.63
33	12	+ 9.57
35	1	+ 8.94
78	21	+ 8.82
40	13	+ 8.19

TABLE I-1--Continued

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Buying	Mean Percentage of Relative Performance of the Insider-Bought Stock (Per Observation)
76	15	+ 8.05
75	6	+ 8.03
20	5	+ 8.01
96	21	+ 7.86
71	5	+ 7.48
17	5	+ 7.19
95	10	+ 6.94
83	3	+ 6.60
46	20	+ 6.57
36	2	+ 6.39
66	4	+ 6.06
51	4	+ 5.73
8	15	+ 5.57
58	4	+ 5.39
49	5	+ 5.19
12	4	+ 4.12
53	5	+ 3.95
10	7	+ 3.75
91	11	+ 3.46
69	6	+ 3.39
44	4	+ 3.36
48	8	+ 3.27
61	7	+ 2.94
85	3	+ 2.89
97	11	+ 2.71

TABLE I-1--Continued

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Buying	Mean Percentage of Relative Performance of the Insider-Bought Stock (Per Observation)
30	18	+ 2.60
27	11	+ 2.55
89	6	+ 2.50
19	14	+ 2.12
60	4	+ 1.82
98	13	+ 1.70
86	11	+ 1.58
90	16	+ 1.37
50	13	+ .98
52	12	+ .93
54	7	+ .78
81	13	+ .75
23	12	+ .73
24	1	+ .54
22	6	- .30
70	2	- .34
43	3	- .43
67	4	- .71
93	7	- .90
5	2	- .94
39	11	- 1.50
94	3	- 1.64
28	7	- 1.96
59	10	- 2.65
56	12	- 2.84

TABLE I-1--Continued

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Buying	Mean Percentage of Relative Performance of the Insider-Bought Stock (Per Observation)
18	8	- 2.93
26	7	- 3.17
37	5	- 3.48
13	1	- 3.91
7	6	- 4.14
29	5	- 4.37
3	7	- 4.44
79	1	- 4.84
82	26	- 5.45
63	3	- 5.64
6	14	- 5.70
15	12	- 5.93
16	7	- 6.71
25	10	- 7.35
45	4	- 8.69
31	5	- 9.69
57	1	- 9.81
77	2	-11.78
62	2	-23.11
65	1	-26.51

TABLE I-2

AVERAGE PERCENTAGE PERFORMANCE OF
INSIDERS' NET SELLING BY COMPANY

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Selling	Mean Percentage of Relative Performance of the Insider-Sold Stock (Per Observation)
10	5	-25.90
35	1	-21.49
80	3	-20.85
90	1	-19.65
85	1	-16.62
16	4	-15.34
81	1	-15.02
13	1	-14.27
27	11	-12.72
75	1	-12.14
91	11	-11.67
76	2	-11.00
15	3	-10.77
22	12	-10.15
12	1	- 9.58
92	8	- 8.97
29	32	- 8.70
70	1	- 8.57
17	11	- 8.30
18	8	- 7.42
48	3	- 7.15
28	13	- 6.32
30	20	- 6.22

TABLE I-2--Continued

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Selling	Mean Percentage of Relative Performance of the Insider-Sold Stock (Per Observation)
93	3	- 5.85
98	2	- 5.70
4	10	- 5.17
67	7	- 5.04
96	10	- 4.95
6	2	- 4.95
3	11	- 4.79
86	10	- 4.32
26	2	- 4.24
46	5	- 3.16
21	7	- 2.94
39	2	- 2.92
9	4	- 2.68
57	10	- 2.65
56	7	- 2.46
49	7	- 1.33
5	14	- 1.32
20	18	- .80
59	5	- .66
78	5	- .54
58	5	- .47
72	10	- .28
69	10	- .13
23	10	- .07
25	2	+ .33

TABLE I-2--Continued

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Selling	Mean Percentage of Relative Performance of the Insider-Sold Stock (Per Observation)
84	11	+ .39
77	16	+ .78
53	18	+ .79
47	17	+ 1.48
83	9	+ 1.70
73	17	+ 2.06
60	10	+ 2.48
55	3	+ 2.80
95	4	+ 2.89
38	12	+ 2.96
33	9	+ 2.98
11	9	+ 3.65
7	3	+ 4.00
71	34	+ 4.01
14	1	+ 4.01
89	12	+ 4.19
19	16	+ 4.49
43	21	+ 4.73
100	23	+ 5.01
97	9	+ 5.02
63	7	+ 5.36
51	9	+ 5.50
94	1	+ 5.66
37	1	+ 7.08
79	4	+ 7.23

TABLE I-2--Continued

Company Identification Number (See Appendix A)	No. of Monthly Observations of Net Selling	Mean Percentage of Relative Performance of the Insider-Sold Stock (Per Observation)
1	6	+ 7.55
54	5	+ 7.93
24	31	+10.28
31	18	+10.33
40	15	+10.79
88	3	+11.12
36	22	+11.91
44	1	+12.50
8	2	+12.87
87	9	+15.76
61	13	+16.61
34	8	+18.59
68	13	+18.73
32	15	+22.06
64	6	+25.62

A P P E N D I X J

A R A N K I N G O F T H E I N S I D E R S ' F O R E C A S T I N G R E C O R D
I N P R E D I C T I N G T H E D I R E C T I O N O F T H E I R
C O M P A N Y ' S S T O C K P R I C E R E L A T I V E T O
T H E M A R K E T A S A W H O L E
S I X M O N T H S L A T E R

APPENDIX J

A RANKING OF THE INSIDERS' FORECASTING RECORD IN PREDICTING THE DIRECTION OF THEIR COMPANY'S STOCK PRICE RELATIVE TO THE MARKET AS A WHOLE SIX MONTHS LATER

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Obser- vations	
American Water Works	19	23	.0013
Sears Roebuck and Company	21	26	.0016
General Electric	28	38	.0029
United Biscuit of America	12	14	.0065
American Airlines	19	25	.0073
White Motor Company	21	29	.0129
General Dynamics Corporation	25	37	.0242
General Cable Corporation	14	20	.0577
Iowa Illinois Gas and Electric	6	7	.0625
Union Chemical and Materials	15	22	.0669

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Observations	
General American Oil of Texas	15	22	.0669
Consolidated Gas Utilities	9	12	.0730
South American Gold and Platinum	10	14	.0898
United Cigar Whelan Stores	10	14	.0898
Kansas Gas and Electric	7	9	.0898
National Lead Company	8	11	.1133
Dover Corporation	12	18	.1189
Allied Laboratories	12	18	.1189
Central Illinois Light	3	3	.1250
Van Norman Industries	19	31	.1401
Talcott (James) Inc.	19	31	.1401
Ekco Products Company	14	22	.1431
San Diego Gas and Electric	11	17	.1662

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Observations	
American News Company	11	17	.1662
Brooklyn Union Gas Company	4	5	.1875
Georgia Pacific Corporation	13	21	.1917
Barker Bros. Corporation	8	12	.1938
Aldens Inc.	9	14	.2120
Spencer Kellogg and Sons	9	14	.2120
Hoffman Electronics Corporation	9	14	.2120
Lerner Stores Corporation	15	25	.2122
St. Joseph Light and Power	5	7	.2266
Climax Molybdenum (American Metal Climax)	10	16	.2272
Great Western Sugar Company	2	2	.2500
Gar Wood Industries	6	9	.2539
Pennsylvania Power and Light	7	11	.2744

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Observations	
Hussman Refrigerator Company	8	13	.2905
Western Pacific Railroad Company	9	15	.3036
Storer Broadcasting Company	3	4	.3125
Consolidated Electrodynamics	13	23	.3388
Mercantile Stores Company, Inc.	7	12	.3872
American Machine and Metals, Inc.	9	16	.4018
Colorado Fuel and Iron	9	16	.4018
United Engineering and Foundry	6	11	.5000
Publicker Industries, Inc.	20	39	.5000
Monsanto Chemical Corporation	12	23	.5000
Reynolds Metals Company	10	19	.5000
Liggett and Myers Corporation	9	17	.5000
Philadelphia and Reading Corporation	9	17	.5000

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Observations	
Tennessee Corporation	7	13	.5000
Chicago Rock Island and Pacific	6	11	.5000
Lane Bryant, Inc.	3	5	.5000
Public Service Company of Indiana	2	3	.5000
Central Illinois Public Service Company	2	3	.5000
Commercial Credit	14	30	.5714
North American Aviation	7	14	.6047
Grayson-Robinson Stores, Inc.	4	8	.6367
General Tire and Rubber Company	11	23	.6612
Sunray Mid-Continent Oil	10	21	.6682
National Distillers and Chemical	9	19	.6762
Seaboard Airline Railroad	9	19	.6762
Twin City Rapid Transit	8	17	.6855

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Observations	
Lehman Corporation	2	4	.6875
Pennsylvania Glass Sand Corporation	2	4	.6875
Cerro de Pasco Corporation	7	15	.6964
Newberry (J. J.) Company	7	15	.6964
Midwest Oil Corporation	6	13	.7095
Midland Steel Products Company	6	13	.7095
McCrary Stores Corporation	5	11	.7256
National Tea Company	4	9	.7461
Buckeye Pipeline Company	1	2	.7500
Phillips Petroleum	7	16	.7728
American Investment (Illinois)	7	16	.7728
Parmelee Transportation Company	3	7	.7734
Beech Aircraft	6	14	.7880

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Observations	
Fifth Avenue Coach Lines	5	12	.8062
Stewart and Warner	5	12	.8062
Monterey Oil Company	5	12	.8062
Minnesota and Ontario Paper	5	12	.8062
Van Raalte Company, Inc.	9	21	.8083
Myers (F. E.) and Bros. Company	2	5	.8125
Smith (A. O.) Corporation	2	5	.8125
Real Silk Hosiery Mills, Inc.	4	10	.8281
Twentieth Century Fox Films	7	18	.8811
Stix Baer and Fuller Company	4	11	.8867
Hercules Motor Corporation	2	6	.8906
American Molasses Company	3	9	.9102
Starrett (L. S.) Company	9	26	.9146

APPENDIX J--Continued

Insiders of	Total Number of		The Estimated Probability of an Equal or Greater No. of Successes Out of the Total No. of Forecasts
	Successful Monthly Forecasts	Monthly Obser- vations	
Kimberly Clark Corporation	9	24	.9242
U. S. Playing Card Company	1	4	.9375
Paramount Pictures Corporation	3	10	.9453
International Tel. and Tel.	10	28	.9554
Heller (Walter E.) and Company	7	24	.9887
Northrop Aircraft	5	20	.9941
General Precision Equipment	5	23	.9967
Federated Department Stores	4	32	1.0000
Overland Corporation	0	2	1.0000
Patino Mines and Enterprises	0	1	1.0000
Wheeling and Lake Erie Railway Company	0	0	No activity
Rhodesian Selection Trust Am. Shs.	0	0	No activity

A P P E N D I X K

FREQUENCY OF SUCCESSFUL FORECASTS OF
DIRECTION IN TWO MODELS, ONE DEFLATED
AND ONE NOT DEFLATED

APPENDIX K

FREQUENCY OF SUCCESSFUL FORECASTS OF DIRECTION IN TWO MODELS, ONE DEFLATED AND ONE NOT DEFLATED

Insiders' Transactions Index: Net No. of Buyers (+) or Sellers (-) in a Stock During a Month	Total No. of Monthly Observations	No. of Successful Forecasts of Direction in Terms of	
		The Model (Performance Deflated)	Dollars (Performance not Deflated)
+7	3	2	1
+6	3	3	3
+5	6	5	5
+4	12	10	10
+3	22	13	14
+2	116	75	77
Total no. of (+) observations	162	108	110

APPENDIX K--Continued

Insiders' Transactions Index: Net No. of Buyers (+) or Sellers (-) in a Stock During a Month	Total No. of Monthly Observations	No. of Successful Forecasts of Direction in terms of	
		The Model (Performance Deflated)	Dollars (Performance not Deflated)
-2	137	64	54
-3	46	33	27
-4	15	5	6
-5	5	3	4
-6	3	3	3
-7	3	3	3
-9	<u>1</u>	<u>1</u>	<u>1</u>
Total No. of (-) observations	<u>210</u>	<u>112</u>	<u>98</u>
Total No. of observations	<u>372</u>	<u>220</u>	<u>208</u>
Percentage of total successes to total forecasts		59.1	55.9

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