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Insider Trading and the Exploitation of Inside Information: Some Empirical Evidence*

Insider trading was found by previous research to yield excess return. This excess return was attributed to exploitation of inside information, leading to the inference that insiders possess and use superior information for their trading. This study examines the extent to which the abnormal return gained by insiders is realized by price changes arising from the disclosure of the trade itself or from subsequent disclosure of specific news about the company to which the insiders might be privy. The results from our sample indicate that a major part of the observed abnormal performance of insiders is likely to be due to price changes arising from the information revealed through the trades themselves. The findings also suggest that there is a low incidence of insider trading in anticipation of an impending new disclosure.

I. Introduction

Rule 10b-5 of the Securities Exchange Act of 1934 prohibits the exploitation of inside information by corporate officers, directors, and large stockholders, usually referred to as insiders. The empirical analysis of insider trading has been the subject of several studies (see, e.g., Finnerty 1976*b*; Jaffe 1974*a*, 1974; Lorie and Niederhoffer 1968). The focus of most of these studies is whether insiders obtain trading gains from use of inside information. The answer to this question has clear implications for market efficiency: under the semistrong form of the efficient market hypothesis, all public information is fully reflected in prices. Under the strong form of that hypothesis securities prices reflect all relevant information, regardless of what information is publicly available, with the implication that no abnormal profits could be made through the use of inside information (see Fama [1970] for an extensive exposition and discussion of the efficient markets hypothesis).

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An important finding of these studies, particularly the more recent ones, is that insiders outperform the market, thus refuting the strong form of the efficient markets hypothesis. An inference that is sometimes drawn from this finding is that insider trading is based on inside information and is therefore in violation of federal law. Thus, Lorie and Niederhoffer (1968, p. 35) state that the objective of their research is to provide definite evidence whether "profitable exploitation by insiders of their special knowledge" occurs. Finnerty (1976*b*, p. 428) concludes that the occurrence of profitable insider transactions implies that "trading on inside information is widespread" and that "insiders actually do violate security regulations"; Jaffe (1974*b*) studies the effect of widely publicized court decisions on the profitability of insider transactions, interfering that the observed trading profits are directly related to illegal exploitation of inside information.

Indeed, given that equilibrium returns are conditional on all public information, any systematic abnormal return may be due, in some sense, to inside information. However, we wish to emphasize that the mere occurrence of insider trading, regardless of whether it is based on inside information, may generate abnormal returns. Since insider trading is closely watched by many investors, it may trigger a wave of transactions in the same direction by outsiders, thereby generating abnormal returns to insiders in the period following their trades. Insider trading, in other words, may serve as a leading indicator to the market. We shall show in the paper that this possibility is, in fact realized and that it explains much of observed insider trading profit.

It is widely accepted that insiders' activities generate interest and increase the trading volume of other market participants. Most financial analysts keep track of insider trading, and some advisory services specialize in gauging insiders' transactions. Financial journals and newspapers are preoccupied with trends in insider trading. The *Wall Street Journal* alone published not less than 50 articles or reports dealing with insider trading during 1979 and 1980. Most of these articles (39 to be exact) pertained to specific companies. Other financial periodicals are similarly attentive to insider trading.

The main purpose of this study is to analyze the association between insiders' trading and subsequent publication of news on their respective companies, and to assess the extent to which abnormal returns earned by insiders are due to (price changes arising from) subsequent disclosure of specific news as distinguished from information that trades by insiders had occurred.

The relationship between insider trading and news disclosure is relevant to an appraisal of the appropriateness of SEC regulations aimed at curbing abnormal profits to insider trading. A strong positive relationship should encourage current enforcement efforts, which are based on attempts to link insider activity to subsequent disclosure of specific

information. However, if there is no such link, and abnormal returns to insiders are due primarily to the response of (other) investors to the trading activity of insiders, the techniques and even the objectives of trading regulation may require reconsideration.

The findings of this paper suggest that much of insiders' observed abnormal returns is explained by information on the occurrence of insiders' trades.

Data and Methodology

Data

A sample of 68 companies was randomly selected from the population of companies whose fiscal year ends December 31 and that were listed on the American Stock Exchange (AMEX) throughout the 3-year period 1973–75.

The AMEX sample represents relatively small companies that are thought to offer higher profit potential to insiders and therefore are likely to reflect trading on inside information. Presumably, the typical insider in smaller companies is more likely to be privy to information with a potentially substantial effect on its stock price than his counterpart in a large corporation.[1] Another reason for the selection of AMEX rather than the New York Stock Exchange (NYSE) is the abundance of information on NYSE companies and the heavy flow of news reports on their affairs. Because of this, use of a sample of NYSE companies would have made it more difficult to link transactions to particular news reports.

Information on insider trading (date, type, and volume of transaction) for the years 1973–75 was retrieved from the *Official Summary of Security Transactions and Holdings* (the Summary) published monthly by the SEC. All insiders are required to report trades in company stocks to the SEC within 10 days subsequent to the last day of the month in which the trading occurred.[2] The sample includes both open market and private transactions but excludes stock bonuses, stock dividends, and exercise of options.

Table 1 presents the distribution of insider transactions during the 3-year period (1973–76) by type and size. Overall, and in each of the 3

1. For characteristics of firms in which insider trading is most likely to occur, see Finnerty (1976*a*).

2. Late reports of transactions have been corrected so that they are recorded as of the date at which they "should have been" reported. In less than 3% of all trades, the Summary shows both purchase and sale of the same security on the same day. In such cases, we excluded the smaller transaction from the sample if its value was less than 25% of the larger one; if the smaller transaction was over 25% of the larger one, we excluded both transactions. Thus, each trading day of each security in the 3-year period is characterized as a "purchase," "sale," or "no transaction." The total number of insider transactions in the final sample was 1,577.

TABLE 1 Distribution of Insider Transactions by Type and Size

Type of Transaction	All Transactions	Size of Transaction			
		Less than $5,000	$5,000–$10,000	$10,000–$20,000	Over $20,000
Purchase	1,151	877	116	86	72
Sale	426	206	82	53	84
All Transactions	1,577	1,083	198	139	157

years, the number of purchases exceeds the number of sales by about 2 to 1. In dollar value, the median purchase was smaller than the median sale ($1,875 vs. $5,085), but the number of large purchases (above $10,000) is about equal to the number of large sales.[3]

All of our return data have been derived from the CRSP tapes. Of the 68 securities in the sample, 12 have data for only part of the period and are therefore represented in the analysis solely by those transactions for which all necessary return data are available. As a result, the final sample used for the analysis of insider performance consists of 1,531 transactions (1,118 purchases and 413 sales).

News

News reports on individual companies were collected from the *Wall Street Journal Index*. Although by no means the only channel of corporate news, the *Wall Street Journal* (*WSJ*) is the most important disseminator of financial news. We assume that all significant events relating to companies listed on the major exchanges are reported in the *WSJ* on a timely basis.[4]

Our procedure requires that we classify news as "good" or "bad." Valid classification of news requires a reference to prior expectations; yet prior expectations of many events are unobservable. Only earnings (and perhaps dividend) events permit, through analysis of their time-series behavior, the construction of some surrogate for what is expected before the event. To avoid the need to define and measure "market expectation," we have classified events as "good," "bad," or "neutral" depending on the market response to their disclosure.

3. The ratio of the number of purchases to the number of sales is similar to that found in the sample used by Lorie and Niederhoffer (1968), 2.1:1. This latter ratio was computed (from Lorie and Niederhoffer's sample) after excluding certain types of transactions, such as gifts and exercise of options, to insure comparability with our sample.

4. To test the comprehensiveness of the *WSJ* as a source of financial disclosure, corporate news relating to a subsample of 20 companies was also collected from the Funk & Scott Index. The *WSJ* contained 366 news items relating to these companies, while the F & S Index reported on only 49 items, 26 of which were reported also by *WSJ*.

The market response is measured by the cumulative abnormal return over the period immediately surrounding the *WSJ*'s report. The procedure employed to estimate abnormal returns and the manner by which these returns are used to classify news are described below.

Estimation Procedure

An observed association between insider transactions and subsequent news disclosure is subject to differing interpretations depending on whether or not insider trading is found to be profitable. Accordingly, we have estimated the return to insider trades in our sample. The performance measure employed is the abnormal return, where the normal rate of return is estimated from the familiar market model, using daily rates of return (adjusted for capitalization). The market rate of return is computed as the equally weighted index of all securities listed on the American and New York Stock Exchanges.

Because of the concentration of small firms (AMEX listing) in our sample, use of daily returns may produce a downward bias in the estimate of the relevant beta. This is because observed daily closing prices may not reflect changes occurring in the market index since the last trade in the stock was executed. Imperfect synchronization between the registered movement of individual stock prices and the market index is particularly serious for thinly traded stocks.[5]

To remove this bias, the betas for individual securities were estimated using the "aggregated coefficients" method. Under this method (proposed by Dimson [1979]), lagged, leading, and contemporaneous market returns are regressed on observed security returns. That is, $\tilde{R}_{jt} = \alpha_j + \Sigma_{k=-n}^{T} \beta_{jk} \tilde{R}m_{t+k} + \epsilon_{jt}$, where R_{jt} denotes the rate of return of security j for day t, α_j, and β_j are parameters, and Rm_t is the actual market rate of return for day t. A consistent estimate of beta is obtained by summing the slope coefficients from this regression. The multiple regressions are run with contemporaneous, 20 lagged (N = 20) and five leading (T = 5) market returns. The lagged terms represent approximately one month of daily returns.

Since the test period (the period during which abnormal returns are being measured) should be completely separate from the estimation period, the α_j and β_j used in conjunction with transactions or events occurring in one year are estimated from data on the previous year. Specifically, the parameters for a given year are estimated from the approximately 250 trading days of the preceding year. The daily abnormal returns are measured by the difference, $\hat{\epsilon}_{jt} = R_{jt} - \hat{R}_{jt}$, where $\hat{R}_{jt}$ is estimated from the regression equation.[6]

5. For a discussion of this measurement problem, see Roll (1981).

6. Another measure of performance that is sometimes used is the market-adjusted returns. According to this measure, the expectation model is expressed as $E(\bar{R}_{jt}/R_{mt}) =$

Let τ denote a given day relative to a transaction day. Thus, if day 0 is the day in which the transaction occurred, $\tau = 1$ denotes day $+1$ (the day following the transaction day) and so on. We define ϵ_τ^p (or ϵ_τ^s), the mean residual for day τ over all purchases (sales) made by insiders, as

$$\epsilon_\tau^p = \sum_{i=1}^{N_p} \left(\frac{\epsilon_{i,\tau}}{N_p}\right) \quad \text{and} \quad \epsilon_\tau^s = \sum_{i=1}^{N_s} \left(\frac{-\epsilon_{i,\tau}}{N_s}\right),$$

where $N_p(N_s)$ is the number of purchase (sale) transactions in the sample and $\epsilon_{i,\tau}$ is the estimated residual in day τ for the security in which transaction i occurred.

We can view $\epsilon_\tau^p(\epsilon_\tau^s)$ as the average residual of a portfolio comprised of all securities that were purchased (sold) by insiders where each security in the portfolio is weighted by the number of times insiders bought (sold) that particular security.[7] The cumulative average residual, $\text{CAR}_m^p(\text{CAR}_m^s)$, is defined as the summation of $\epsilon_\tau^p(\epsilon_\tau^s)$ from day 0 to day m.

$$\text{CAR}_m^p = \sum_{\tau=0}^{m} \epsilon_\tau^p \quad \left(\text{and } \text{CAR}_m^s = \sum_{\tau=0}^{m} \epsilon_\tau^s\right).$$

Previous studies (e.g., King 1966; Meyers 1973) indicate the existence of interdependence among the residuals of different securities in a given month. This implies that the assumption of independent observations, which is necessary for common statistical tests, may not be satisfied. Therefore, in testing the significance of estimated abnormal returns, we have measured the residual variance of a portfolio directly, using a procedure similar to that employed by Jaffe (1974*a*) and Mandelker (1974). This procedure (described in App. A) takes into account the correlation among contemporaneous residuals of different securities.

Classifying News

News is classified as good, bad, or neutral, depending on the observed cumulative abnormal return (CAR) over the period surrounding the

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R_{mt} and the abnormal return is given by $\hat{\epsilon}_t = R_{jt} - R_{mt}$. This model is consistent with the asset pricing model when all securities have systematic risk of unity, and it has the advantage of being free of the problems of estimating systematic risk. Moreover, this model has been found to be as powerful as the market model in detecting and assessing abnormal returns (see Brown and Warner 1980). However, when applied to our data, the results from this model are similar to those derived from the market model and therefore have not been reported.

7. The portfolios for the buy and sell transactions assign equal weight to each transaction regardless of its size. However, given the very skewed distribution of transaction size (the largest 10% transactions account for 88% of the total value of all transactions), a value-weighted portfolio would essentially represent the characteristics of stock returns associated with a small number of transactions. Nevertheless, some of the analyses that follow produce results that involve a breakdown of transactions by size.

news disclosure data. Specifically, the CAR of event i is computed as $CAR_i = \Sigma_{\tau=-1}^{5} \epsilon_{i\tau}$; that is, the summation of the residuals over the disclosure day, the preceding day, and the following 5 days. The dispersion of CAR_i is measured by the standard deviation of the CARs (computed over the CARs derived from the nonoverlapping 7-day intervals) in the previous year. The standardized CAR_i, $SCAR_i = CAR_i/\sigma_i$ (CAR), which has a t-distribution with $v - 1$ degrees of freedom (v being the number of nonoverlapping 7-day intervals), is employed to classify the event.

An event is said to convey good news if its SCAR is greater than some value w and bad news if its SCAR is smaller than $-w$. Different values for w were tried (1.8, 1.6, 1,3, 1.0, and 0.0), but the results obtained were qualitatively similar regardless of the value of w selected. For the sake of parsimony, only results based on the 1.3 value point are presented.[8]

Eleven classes of events have been defined and labeled as good, bad, or neutral news. A listing of these event classes is provided in Appendix B. The total number of events for companies in the sample observed during the period January 1, 1973–June 30, 1976 was 1,437.[9]

To investigate the association between insider trading and subsequent release of news, the periods following insider transactions are scrutinized for the first publication of news on the concerned company. Eight search intervals were used: 5, 10, 30, 45, 60, 90, 120, and 180 trading days following the transaction day.[10]

There are eight possible types of transaction/news combinations (buy or sell transaction coupled with one of the news categories)—bad news, good news, neutral news, or no news. Frequent incidence of good news releases following insider purchases, or of bad news releases following insider sales, is taken to be consistent with the hypothesis that insiders exploit inside information on specific forthcoming disclosures for trading gains.

The analysis considers only the first good or bad news that appears after an insider transaction. Admittedly, the first news published might

8. The cut-off point of 1.3 yields a subsample of about 40% of the (most extreme) cases.

9. All of the events used are considered to have been material in the legal sense. In other words, they were of such importance that they "could," according to the language of the law, "reasonably have been expected to affect the judgment of investors in their buy, hold, or sell decisions" and as a result to have affected the market price of the security. Acting upon an advance inside knowledge of such material information is, of course, prohibited by law.

10. It is assumed that most transactions of insiders that are triggered by a specific piece of private information are made in anticipation of an impending disclosure of the news. It is hard to envision situations in which a material piece of information could be (or could have been expected to be) kept from the public for very long. This consideration led to the selection of a maximum search period of about 9 months (180 trading days) after the transaction.

not have been that which motivated the purchase or sale. However, if insiders do trade in anticipation of a subsequent disclosure of their information, one would expect a positive association between the direction of the transaction and the content of the first news that follows.[11]

Test and Results

The results in table 2 indicate that insiders are able to identify profitable and unprofitable situations in their own companies. The cumulative abnormal return over the 240 trading days (about a year) following the transaction is 8.60%, with the sell transactions yielding an impressive cumulative average return of 11.53% over the same period.[12] Although large abnormal returns are observed over the entire posttransaction sample period, the cumulative abnormal return during the 2 months immediately subsequent to sale transactions was approximately zero. We shall comment on this finding below.

A *t*-test was employed to test the significance of the abnormal returns during the first 60 days (approximately 3 months) subsequent to a transaction. Because the ordinary *t*-test assumes independence of observations that may be inappropriate here (on account of intercorrelation of abnormal returns across securities during a given time period), we adopted a test procedure (described in App. A) that alleviates this problem while permitting use of the *t*-statistic. The results from use of this modified *t*-test show that the abnormal returns in this period are significantly different from zero at the 5% significance level. Examination of data for individual industries suggests that the phenomenon of abnormal gains to insiders is widespread although the level of the abnormal return varies among industries.

The finding of excess return subsequent to insider trading is in accord with the results of previous studies (based on different samples). For example, Jaffe (1974*a*) reports for the intensive trading samples a cumulative abnormal return of about 5% over the first 8 months after the transaction (including the transaction month) and Finnerty (1976*a*) finds a cumulative abnormal return of about 4.8% over the same period (an average of his reported results for sell and buy portfolios).

Our estimate of abnormal returns is 8.0% over an 8-month holding period. The greater abnormal returns found in this study may be due in part to the fact that our sample consists of relatively small AMEX-listed companies while Jaffe and Finnerty's samples consisted of large

11. It may be noted that events are not very frequent—an average of about six events per company per year (1,437 events for the 68 companies in the sample) over a period of 3½ years.

12. The comparable estimates of abnormal returns from the market-adjusted returns model (not reported here) are 7.62% and 9.54%, respectively.

TABLE 2 **Performance of Insiders as Measured by Abnormal Returns (the Abnormal Return for Sell Transactions Was Multiplied by −1)**

Period (Trading Days)	Average Abnormal Return for the period	Cumulative Abnormal Return	Standard Deviation of Cumulative Abnormal Return	*t*-Value for the Average Cumulative Abnormal
	A. *All Transactions* (1,531 Transactions)			
0– 9	.0110	.0110	.1233	...
10– 19	.0048	.0158	.1692	3.45
20– 39	.0126	.0284	.2269	7.62
40– 59	.0125	.0409	.2742	11.80
60– 79	.0047	.0456	.3324	
80– 99	.0106	.0562	.3867	
100–119	.0002	.0564	.4402	
120–139	−.0002	.0562	.4863	
140–159	.0036	.0598	.5459	
160–179	.0106	.0704	.5945	
180–199	.0116	.0820	.6467	
200–219	.0034	.0854	.6960	
220–239	.0006	.0860	.7525	
	B. *Buy Transactions Only* (1,118 Purchases)			
0– 9	.0175	.0175	.1250	...
10– 19	.0079	.0254	.1724	5.90
20– 39	.0135	.0389	.2294	10.81
40– 59	.0056	.0445	.2833	13.25
60– 79	.0051	.0496	.3389	
80– 99	.0082	.0578	.3946	
100–119	−.0024	.0552	.4537	
120–139	−.0006	.0546	.5005	
140–159	.0008	.0554	.5628	
160–179	.0073	.0627	.6171	
180–199	.0157	.0784	.6702	
200–219	−.0006	.0778	.7243	
220–239	−.0026	.0752	.7843	
	C. *Sell Transactions Only* (413 Sales)			
0– 9	−.0066	−.0066	.1169	...
10– 19	−.0037	−.0103	.1577	−1.34
20– 39	.0102	.0001	.2176	.12
40– 59	.0207	.0309	.2480	
60– 79	.0038	.0347	.3140	
80– 99	.0171	.0518	.3649	
100–119	.0077	.0595	.4021	
120–139	.0011	.0606	.4464	
140–159	.0111	.0717	.4975	
160–179	.0205	.0912	.5285	
180–199	.0007	.0919	.5787	
200–219	.0143	.1062	.6133	
220–239	.0091	.1153	.6578	

NOTE.—The "monthly" return is computed over 20 trading days. See App. A for derivation of the *t*-statistic.

Additional Statistics

	1 Quartile	Median	Third
β	.780	1.220	1.620
R^2	.136	.173	.211

NOTE.—Durbin-Watson statistics indicate no autocorrelation in 80% of the regression, inconclusive result in 13% of the cases, and positive autocorrelation in 7% of the cases.

TABLE 3 **Distribution of Corporate Events Reported by the *Wall Street Journal* by Content and Type**

	Total	Good News	Bad News	Neutral News
Earnings announcements	855	175	189	491
Management forecasts	67	16	15	36
Dividends news	313	87	53	173
Operational plans (product line, acquisitions, contracts)	163	44	31	88
Other events	39	6	7	26
	1,437	328	295	814

companies in the NYSE. The persistence of abnormal returns over a relatively long period suggests that the typical insider transaction may not have been triggered by a forthcoming disclosure of a single event.

Table 3 presents the distribution of events by content categories. As explained above, the content of each event is determined by the market response to its disclosure and the results that are presented relate to the 1.3 cut-off point. Although reports on earnings are about equally divided between good and bad news, reports of news (other than earnings) are predominantly favorable (roughly three good reports to two bad ones). A similar finding, but for a different sample, is reported by Palmon and Schneller (1980).

We attribute the prevalence of good news to the fact that many, if not most, corporate news reports are initiated by voluntary disclosure (press releases, news conferences, etc.), which are biased toward reporting favorable news. Some support for this conjecture is provided by the fact that reports of earnings, over which management exercises at most only limited control, are not biased in favor of good news.

Table 4 describes the association between insiders' transactions and subsequent publication of news on their company's affairs. Data on news were gathered and classified as described in the previous section. The results presented in table 4 describe the aforementioned association for four intervals (10 days, 20 days, 60 days, and 90 days) after the transaction day. No association was found between the type of transaction (purchase or sale) and the content of the first subsequent news report; that is, there was no tendency for insiders' purchase transactions to precede good news or for sale transactions to precede bad news.

It has been conjectured that exploitation by insiders of forthcoming news is more likely when disclosure is discretionary (e.g., management forecasts, disclosure of future plans, etc.) than when disclosure is more nearly mandatory (e.g., earnings reports or dividends announcements).

TABLE 4 Distribution of Insider Transactions by Type of Transaction and Content of the First Following News Report

Period Examined after Transaction (Trading Days)	Type of Transaction	News Content				All Transactions
		Good	Bad	Neutral	No News	
10 days	Purchase	46	43	87	969	1,145
	Sale	15	19	38	353	425
	All transactions	61	62	125	1,322	1,570
20 days	Purchase	84	88	185	788	1,145
	Sale	47	34	78	266	425
	All transactions	131	122	263	1,054	1,570
60 days	Purchase	228	191	542	184	1,145
	Sale	83	83	185	74	425
	All transactions	311	274	727	258	1,570
90 days	Purchase	242	216	624	63	1,145
	Sale	97	89	221	18	425
	All transactions	339	315	845	81	1,570

To test this conjecture we have prepared table 5, which summarizes the association between insider transactions and subsequent publications of discretionary news. The results are similar to those exhibited in table 4, revealing no association of purchase (sale) transactions with the "discretionary" release of good (bad) news.[13]

Thus far, the analysis has given equal weight to each transaction, regardless of its size. It is possible that the motivation for, and as a result the outcome of, small and large transactions is different. But theory gives us no reason to suppose there is any particular relation between transaction size and reliance on inside information. It might be supposed that small transactions are induced by liquidity considerations while larger transactions result from evaluation of a firm's prospects. It might also be supposed that possession of inside information could convince insiders to commit more resources than "non-inside" information would lead otherwise comparable investors to commit. If these suppositions hold, the larger the transaction the more likely it is

13. The results of tables 4 and 5 are subject to two caveats: (1) The basis for classifying events is stock price behavior around the time of their disclosure. Improper definition and misspecified measurement of abnormal return may lead to a bias against finding association between insider transactions and the alleged content of subsequent news. (2) Despite its good overall coverage of corporate news, it is likely that some events may go unreported in the *WSJ*. This has the effect of biasing the results against finding a link between insider trading and subsequent events.

TABLE 5 **Distribution of Insider Transactions by the Type of Content of the First Following News Report Concerning Operational Plans, Management Forecasts or Other Nonroutine Events***

Period Examined after Transaction (Trading Days)	Type of Transaction	Good	Bad	Neutral	No News	All Transactions
10 days	Purchase	11	8	13	969	1,001
	Sale	6	1	9	353	369
	All transactions	17	9	22	1,322	1,370
20 days	Purchase	19	16	33	788	856
	Sale	10	5	15	266	296
	All transactions	29	21	48	1,054	1,150
60 days	Purchase	43	21	65	184	313
	Sale	10	5	38	74	127
	All transactions	53	26	103	258	440
90 days	Purchase	46	21	78	63	208
	Sale	11	5	41	18	75
	All transactions	57	26	119	81	283

*Transactions that were followed within the search period, first by earnings or dividend announcements, were discarded.

to be stimulated by inside information. On the other hand, the mandated disclosure of insider trading and the conspicuousness of very large transactions might lead insiders to disguise their activity, perhaps by using a series of relatively small and innocuous transactions to achieve a given total commitment.

The results reported in table 6 show that large insider transactions are not more profitable than smaller ones: the difference in the cumulative abnormal return (over the 240 days following an insider transaction) between large and other transactions is insignificant. In addition, the findings exhibited in table 7 do not support the conjecture that large insider transactions are more likely to be associated with inside information. That is, there is no positive relationship between the direction (buy/sell) of large transactions and the content of subsequent news disclosure. In fact, there is some tendency for large transactions that precede news to be in the wrong direction. (In both tables 6 and 7, large transactions are those whose size exceeds the third quartile of the transaction-size distribution, which is equal to $6,700.)

The analysis of the link between insider trading and subsequent news disclosure is based on the classification of news by content, which, in turn, relies on the estimation of abnormal returns. A measure of insiders' attempts to exploit inside information, which is independent of the

TABLE 6 Performance of Insider Transactions by Size of the Transaction

Period (Trading Days)	Large Transactions*		All the Rest	
	Abnormal Return in the Period	Cumulative Abnormal Return	Abnormal Return in the Period	Cumulative Abnormal Return
0– 19	−.0034	−.0034	.0221	.0221
20– 39	.0076	.0042	.0143	.0364
40– 79	.0291	.0333	.0132	.0496
80–119	.0338	.0671	.0042	.0528
120–159	−.0002	.0669	.0054	.0574
160–199	.0161	.0830	.0243	.0817
200–239	−.0047	.0783	.0052	.0869

*Large transactions are those whose size exceeds the third quartile of the transaction-size distribution, which is $6,700.

TABLE 7 Distribution of Large Insiders' Transactions* by Type of Transaction and the Content of the First Following News Report

Period Examined after Transaction (Trading Days)	Type of Transaction	News Content				All Transactions
		Good	Bad	Neutral	No News	
10 days	Purchase	15	10	12	172	209
	Sale	7	9	8	161	185
	All transactions	16	16	18	333	394
20 days	Purchase	20	20	27	142	209
	Sale	20	14	29	122	185
	All transactions	40	34	56	264	394
60 days	Purchase	48	49	69	43	209
	Sale	38	26	86	35	185
	All transactions	86	75	155	78	394
90 days	Purchase	51	53	86	19	209
	Sale	43	28	99	15	185
	All transactions	94	81	185	34	394

*Large transactions are those whose size exceeds the third quartile of the transaction-size distribution, which is $6,700.

definition of the content of the event, is the degree of clustering of events during periods following insider transactions. If indeed insiders tend to transact in anticipation of a forthcoming disclosure of news, we would expect to find that periods after insider trades are more eventful. To construct a test for news clustering consider the following: the total number of events (good, bad, or neutral) relating to the 68 firms in the

TABLE 8 **Probability of an Eventless Period of N Days**

Length of Period (Trading Days)	All Events		Nonroutine Events	
	Theoretical Probability*	Actual Probability	Theoretical Probability**	Actual Probability
5	.886	.925	.978	.985
10	.784	.842	.956	.964
30	.482	.505	.874	.898
45	.335	.315	.817	.839
90	.112	.052	.667	.685
180	.013	.024	.445	.500

NOTE.—The Kolmogorov sample statistic is .060 (significant at 1%) for all events and .066 (insignificant) for nonroutine events.

*Probability of an eventless day is .9760.

**Probability of an eventless day is .9955.

42-month period is 1,437, implying a probability of 0.0240 for an eventful day. (This assumes events are distributed uniformly over the period and neglects the unlikely possibility of more than one event in a given day.) The probability of an eventless period of n days is $(1 - 0.0240)^n$, assuming events are randomly distributed over time.

The theoretical and actual frequencies of eventless periods of various lengths are provided in the first two columns of table 8. The null hypothesis of equality between the distributions is rejected at the 1% significance level using the Kolmogorov test for differences between distributions (see Conover 1980, pp. 346–53). The analysis does not reveal any clustering of events in the period following insider transaction; in fact, this period even contains fewer events than usual. Because the assumption of a random distribution of events does not strictly hold for earnings and dividend announcements which are made routinely every 3 months, the nonroutine events are analyzed separately. The results, reported in the last two columns of table 8, are similar to those for all the events.

Thus far, our analysis has produced no results consistent with the hypothesis that insiders exploit information about forthcoming news disclosure to obtain trading gains. This suggests that the observed profitability of insider trading derives either from market response to the information revealed through publication of the trades themselves or from longer-term developments not captured by the disclosure of specific events in the period immediately following insider trades. As noted above, investors may perceive insider trading as a signal conveying information about future events, or as a leading indicator.

We shall try now to identify that portion of abnormal return to insiders that is due to the leading indicator effect and independent of the effect of contemporaneous news disclosures. This is not an easy task. Ideally, one would study the effect of insider trading during periods of

a complete information vacuum; however, such periods are rare. As a compromise, we analyze such transactions as occur in almost eventless periods—time intervals surrounding the transaction date during which there was no publication of news (about the relevant company) in the *WSJ*. Concentration on almost eventless periods stems from our wish to neutralize the confounding effect of market reaction to company-related events (other than reports of trading by insiders) whose disclosure immediately precedes, follows, or coincides with insiders' transactions.

A transaction is said to occur in an eventless period if no news (good, bad, or neutral) is reported in days -5 to $+19$ relative to the transaction day. Eventless period transactions are divided into four groups according to the nature of the news disclosed during the period extending from day $+20$ to day $+59$ following the transaction: (1) transactions not followed by any news disclosure; (2) transactions that are followed by news disclosure with the "predicted" content (i.e., good news after purchase, bad news after sale); (3) transactions that are followed by news disclosure with content contrary to prediction; and (4) transactions that are followed by neutral news. Transactions that are followed within that interval (days $+20$ to $+59$) by more than one event are discarded.[14] If insider transactions do not themselves convey news, abnormal returns should not be expected to arise from insider transactions occurring during information vacuum periods. Accordingly, the hypothesis to be tested is that no abnormal returns exist for transactions in all four groups during days 0–19 and that none exist for transactions in group 1 during days 20–59.

The results of our analyses for all transactions, and for large transactions separately, are presented in table 9. Columns 3–16 correspond to the four groups of transactions described above; column 2 summarizes the results for all four groups combined. The findings are as follows: insiders' transactions are associated with a strong stock price movement in the direction of the trade during the month (20 trading days) following the trade, independent of concurrent publication of news. This is true for both purchases and sales. The average abnormal return during the first month of insider transactions made in a period of an information vacuum is 2.35% (2.65% for purchase and 1.40% for sales), significantly greater than zero (at the 5% level).

As could be expected, when insider transactions concur with or are immediately followed by news in the right direction, their profitability is further enhanced. Column 7 shows that the abnormal return during the first months of transactions associated with publication of the right news is 7.67% (8.22% for purchases and 6.49% for sales). Conversely, publication of news in the wrong direction at, or around, the time of the

14. Less than 10% of the transaction had to be discarded for this reason.

TABLE 9 **Abnormal Returns of Insider Trading by the Proximity of the Transactions to Subsequent News Disclosure (Number of Cases in Parentheses)**

Type and Size of Transaction	Holding Period (Trading Days)	All Cases (1)	Transactions with No News in Days −5 to +19					Transactions with News in Days −5 to +19		
			Total (2)	No news in the Next 40 Days (3)	News in the Right Direction in the Next 40 Days (4)	News in the Wrong Direction in the Next 40 Days (5)	Neutral News In the Next 40 Days (6)	In the Right Direction (7)	In the Wrong Direction (8)	Neutral (9)
All transactions:										
1. Transactions		(1,388)	(895)	(155)	(183)	(126)	(431)	(103)	(111)	(279)
of all sizes	0–19	.0167	.0235	.0301	.0240	.0293	.0192	.0767	−.0877	.0142
	20–59	.0232	.0314	.0138	.1072	−.0956	.0431	.0034	−.0150	.0189
2. Large		(327)	(206)	(36)	(37)	(44)	(89)	(32)	(26)	(63)
transactions*	0–19	.0033	.0091	.0024	.0751	−.0059	−.0083	.0659	−.0995	−.0049
	20–59	.0267	.0211	.0023	.1541	−.0815	.0240	.0163	−.0361	.0666
Buy transactions:										
1. Transactions		(1,014)	(669)	(111)	(137)	(91)	(330)	(70)	(80)	(198)
of all sizes	0–19	.0224	.0265	.0407	.0168	.0267	.0257	.0822	−.0851	.0311
	20–59	.0173	.0334	.0256	.1138	−.1341	.0489	−.0096	−.0511	−.0006
2. Large		(177)	(112)	(23)	(26)	(26)	(37)	(16)	(17)	(32)
transactions*	0–19	.0013	.0053	.0420	.0541	−.0456	−.0162	.1081	−.1104	−.0069
	20–59	−.0078	.0011	.0262	.1443	−.1534	−.0066	−.0918	−.0662	.0396
Sell transactions:										
1. Transactions		(374)	(226)	(44)	(46)	(35)	(101)	(33)	(31)	(84)
of all sizes	0–19	.0011	.0140	.0034	.0452	.0361	.0021	.0649	−.0946	−.0249
	20–59	.0394	.0258	−.0159	.0880	.0051	.0234	.0309	.0784	.0642
2. Large		(150)	(94)	(13)	(11)	(18)	(52)	(16)	(9)	(31)
transactions*	0–19	.0057	.0135	−.0677	.1246	.0513	−.0027	.0236	−.0790	−.0028
	20–59	.0674	.0449	−.0401	.1775	.0226	.0459	.1346	.0206	.1142

*Large transactions are those whose size exceeds the third quartile of the transaction size distribution, which is $6,700.

transaction adversely affects insider performance. In fact, a negative abnormal return results from transactions that coincide with the disclosures of the wrong news (see col. 8).

Although the results for large transactions are qualitatively similar to those for all, it is nonetheless surprising to find that large transactions made during an eventless period were associated (on average) with less pronounced stock price reactions than smaller transactions (0.91% vs. 2.35%; see col. 2). This is consistent with previous studies which also failed to find evidence of greater gains to larger transactions (e.g., Jaffe [1974*a*], who reports roughly equal excess returns to large and average size insider transactions, and Lorie and Niederhoffer [1968], who report results suggesting that the size of insider transactions is not a better predictor of future price changes than the mere number of such transactions). At present, we cannot offer a satisfactory explanation of this finding.[15]

Because it is possible that the test period of 20 trading days (days 0–19) may not contain the price effects of trades whose existence is officially revealed only later (i.e., after publication of the *Official Summary,* which occurs 20–30 trading days after the actual transactions), we examined the abnormal returns of insider trades that were followed by an eventless period of 30–40 days (the number of available cases was naturally smaller in these tests). The results show that the abnormal returns in the longer test periods are higher (3.42% for 30-day period and 3.76% for 40-day period, compared with the 2.35% reported in table 9, second row of col. 2, for the 20-day test period). This finding provides added support for the "leading indicator" hypothesis.

The results reported in table 9 make it clear that the main reason for the small negative abnormal return recorded for sale transactions in the first month is the adverse effect of coinciding disclosure of good news. Another interesting finding is that the negative effect on insiders profitability of dislcosure of the wrong news is only short-lived, particularly in the case of sales: over a longer time span, the general superior performance of insiders seems to prevail.

In sum, the findings of table 9 reinforces the notion that, rather than being produced by exploitation of inside information on specific news to be disclosed, insiders' superior performance is due to better assessment of their firms's affairs, and, consequently, the tendency of investors to follow in their footsteps (the "leading indicator" effect).

Concluding Remarks

This study attempts to determine the extent to which the abnormal returns of insider transactions found by previous studies (and

15. It may be that some of the largest insider transactions represent significant shifts in ownership that had been publicized before the trade or perhaps were not interpreted by investors as reflective of (inside) information.

confirmed once again for this study's sample) are due to price changes caused by the subsequent disclosure of news and by information revealed by the trade itself. The evidence suggests that profits from insider trading are not associated with disclosure of specific news about the company; that is, the abnormal return to insider transactions endures well beyond the typical period of market reaction to the disclosure of a specific news event. Moreover, the results also show that a significant abnormal return is produced in the wake of the trades themselves, lending support to the conjecture that (outside) investors accept the superior knowledge and follow the footsteps of insiders.

These findings do not imply that instances of illegal exploitation of insider information do not occur. Nevertheless, our results suggest that such instances do not dominate the overall statistics and cannot explain the observed profitability of insider trading.

Study of the degree to which investors follow the lead provided by insiders (the leading indicator hypothesis) would be greatly assisted by the availability of volume of trade data. Testing the implication that insider trading triggers additional trading by followers would be a worthwhile extension of the present research.

Appendix A
Testing the Significance of Abnormal Returns

The purpose of this procedure is to circumvent the statistical testing problem that might arise from the possible interdependence among residuals of returns (from different companies) in the same month. While the following discussion refers only to buy transactions, it applies without modification to sell transactions as well.

For each month t (measured as 20 trading days), a portfolio denoted as portfolio $t(x)$ is constructed consisting of all securities bought by insiders in that month or in the preceding x months. In our study, x receives the alternative values of 0, 1, and 2. The residual of portfolio $t(x)$ in month t, $\epsilon_{t(x)}$, is calculated. Each security is weighted according to the number of times it was bought by insiders over the $x + 1$ months from $t - x$ to t. The number of portfolios, N, is a function of x; the maximum number of portfolios corresponds to $x = 0$ and is, in our sample, 37 (the number of months, or 20-trading-day periods, from January 1973 to December 1975).

The portfolio residual $\epsilon_{t(x)}$ is standardized by its deviation estimated from the K periods preceding period t. In our study we use $K = 50$. The resulting variables $\epsilon^s_{t(x)}$ can be viewed for a given x as independent and identically distributed.

The average standardized residual across the N portfolios, $\epsilon^{\bar{s}}_{t(x)}$, is computed. For each portfolio we derive the t-statistic

$$\frac{\epsilon^{\bar{s}}_{t(x)}}{S(x)/\sqrt{N(x)}} \sim t(v), \quad v \approx KN(x),$$

when $s(x)$ is the estimate of the standard deviation of $\epsilon^s_{t(x)}$. Since each of the

$N(x)$ residual terms is already standardized, the value of S is constrained to be one. The large number of degrees of freedom allows, in fact, the use of the normal distribution. Three values of t are produced, for $x = 0, 1, 2$, and are employed to test the hypotheses concerning the residual in the first 20 trading days after the transaction, the cumulative residual over the first 40 days, and the cumulative residual over the first 60 days, respectively.

Appendix B
Events Classes

1. Earnings announcements.
2. Dividends announcements and news.
3. Management forecast concerning earning or sales.
4. Expansions and acquisitions.
5. New products, discoveries, and patents.
6. Award of a contract.
7. Cancellation of previously announced plans or contracts.
8. Labor disputes and their settlement.
9. Stock dividend, stock split, stock repurchase.
10. Litigation.
11. Other news: layoffs, unionization, recalls, legislation, etc.

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