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The Specialists Short Sale Ratio as an Investment Tool

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Abstract

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The ratio of short sales by specialists on the New York Stock Exchange (NYSE) to total short sales on the NYSE has been suggested as a technical trading rule by those attempting to "follow the smart money." This study analyzes this trading rule under several assumptions and concludes that it is generally <u>not</u> a viable trading rule. These results suggest the weak form efficient market hypothesis.

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THE SPECIALISTS SHORT SALE RATIO
AS AN INVESTMENT TOOL[*]

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INTRODUCTION

The general purpose of technical trading rules is to identify a
major change in the direction of the securities market through the use
of market information. These trading rules can be categorized as either
"contrary opinion" rules or rules intended to "follow the smart money."
Contrary opinion rules attempt to identify particular investing groups
that supposedly are wrong regarding market trends at peaks and troughs
in the market. Once a contrary trend is indicated, the astute technical
investor would then trade opposite to this trend. A classic group in
this respect has been the odd-lot investor. In contrast, the smart
money rules are based upon identifying investor groups that are per-
ceived as successful and/or sophisticated. The technical analyst
attempts to determine what these astute investors are doing and then do
the same as "the smart money." One example in this regard is corporate
insiders who appear to be able to consistently derive above average
returns on investments in their own companies.[1] Another popular group

[1]Studies in this area include, James H. Lorie and Victor Neiderhoffer,
"Predictive and Statistical Properties of Insider Trading," Journal of
Law and Economics, Vol. 11 (April 1968), pp. 35-53; Jeffrey Jaffe, "Spe-
cial Information and Insider Trading," Journal of Business, Vol. 47,
No. 3 (July 1974), pp. 410-428; Joseph E. Finnerty, "Insiders and Market
Efficiency," Journal of Finance, Vol. 31, No. 4 (September 1976), pp.
1141-1148.

are stock exchange specialists, who have consistently been able to earn
returns substantially above average.[2] Given the recognition that spe-
cialists are clearly superior, the objective of a technician is to
determine an available series that indicates their attitude. One such
series is short sales by the specialists. In turn, specialists short
sales can be related to total short sales to determine what proportion
is attributable to all specialists on the NYSE. This paper has three
objectives. The first is to explain a technical trading rule using the
specialists short sale ratio. Second, we will examine the short sale
ratio series over time relative to general stock price movements.
Finally, we will test the short sale ratio series as a trading rule
under realistic conditions.

Section two contains a discussion of the specialists short sale
ratio and the specific trading rule set forth by technicians. There is
also a discussion of the data used in deriving the short sale ratio and
its availability. In section three we examine a time series plot of
the two series to determine the general relationship between the spe-
cialists short sale ratio and coincident stock price movements. The
basic question considered in this section is whether the hypothesized
relationship between the short sale ratio and stock prices prevailed
on a coincident basis--i.e., does it appear that specialists act as
expected at market peaks and troughs? Section four contains the results
of testing a specific trading rule that employs the specialists' short

[2] For evidence in this regard, see Report of the Special Study of
the Securities Markets (Washington, D.C.: Securities and Exchange Com-
mission, 1963), Part 2, p. 54.

sale ratio to buy and sell stocks. The final section contains a summary and conclusion which contains a discussion of the implications of the results for the efficient markets hypothesis.

SPECIALISTS' SHORT SALE RATIO

The specialists short sale ratio is equal to the number of shares sold short by all the specialists on the NYSE during the week relative to the total number of shares sold short on the NYSE during the same week. The short selling by the specialist is generally in response to his marketmaking function--i.e., the specialist will sell stock short if there is abnormal demand, and he does not currently have any stock in inventory. On average, the specialist has historically accounted for about 55 percent of all the short sales on the Exchange. This means that the average specialist short sale ratio has been 55 percent. When analyzing specialists' actions it is crucial to determine when they deviate from the normal ratio. The point is, specialists have some discretion in their short selling depending upon their outlook of the market. If they are bearish and feel the market is near a peak, it is possible for them to increase their short selling. Therefore, technicians contend that when the short sale ratio increases from its average value of 55 percent to over 60 percent it is an indication of reticence on the part of specialists. When the short sale ratio gets above 65 percent, it indicates that the specialists are very bearish and are attempting to increase their short position in anticipation of a market peak.

In contrast, when specialists feel bullish, it is hypothesized that they will reduce their short selling. Thus, when the short sale

ratio declines to 45 percent it is considered bullish, and when it goes below 40 percent it is an indication that specialists are very bullish.[3]

Data

The data to derive the specialists short sale ratio is contained weekly in Barron's "Market Laboratory" section. Specifically, the "Week's Market Statistics" section contains the total short sales and specialists short sales. Notably, the short sale data contained in a given edition are for the week ended two weeks prior to that time--e.g., the Barron's of Monday, April 21 will contain short sale data for the week ended Friday, April 4.[4] This 17 day reporting lag will be considered when we test the trading rule using this ratio.

COINCIDENT RELATIONSHIP BETWEEN SERIES

In this section we examine the coincident relationship between the specialist short sale ratio and the Dow Jones Industrial Average (DJIA). We want to determine if there is the hypothesized relationship between the short sale ratio and stock prices. Specifically, when the specialists short sale ratio is in the range of 60-65 percent, is the stock market generally near a peak? Alternatively, are stock market troughs coincident with a short sale ratio in the 40-45 percent range?

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[3]This ratio is discussed in, Frank K. Reilly, Investment Analysis and Portfolio Management (Hinsdale, Ill.: The Dryden Press, 1979), p. 400; and Jerome B. Cohen, Edward D. Zinbarg and Arthur Zeikel, Investment Analysis and Portfolio Management 2nd ed. (Homewood Ill.: Richard D. Irwin, Inc., 1977), pp. 567-568.

[4]This reporting lag was three weeks prior to 1974.

Clearly, if there is no general conformity as hypothesized by techni-
cians, it is difficult to imagine that any trading rule using the short
sale ratio would be of value.

Specialist Short Sale Ratio

Exhibit 1 contains the time series plot of a four week moving
average of the specialists short sale ratio for the period 1971 through
1979. We derived a four week moving average because the raw series is
extremely volatile and difficult to examine. The moving average smooths
the series and makes it possible to examine the overall trend of the
series.

Prior to discussing the relationship of the short sale ratio series
to stock prices, it is important to consider the short sale ratio
series alone because of the apparent trend during the test period.
Specifically, during the 1971-1975 period, the ratio appeared to fluc-
tuate around the 55 percent level with several observations above 60
percent. Following its recovery from a low point in September-October,
1974 (below 40 percent), the high point was below 60 percent and
following a double trough in August and December of 1975, the series
had another peak below 60 percent. Following this peak, the series has
experienced a clear, secular decline. The highest point was barely
above 50 percent in August, 1978, and the ratio has generally been in
the 40-50 percent range.

The time series plot clearly indicates a clear secular decline in
the proportion of short selling by the specialist. An analysis of the
components of the short sale ratio series indicates that the secular

decline apparently has been caused by three factors. These include an increase in total volume, a less than proportional increase in total short selling, and a smaller increase in specialists short selling. Specifically, total trading volume on the NYSE has increased from about 10 million shares a day in the early 1970's to almost 40 million shares a day in 1979. Exhibit 2 is a time series plot of total weekly short sales to average daily volume on the NYSE. An analysis of this plot indicates a reasonably constant proportion that ranged from 28 to 45 percent for the period prior to 1976. In contrast, the proportion of short sales to total volume during the last four years ranged between 20 to 40 percent. This indicates a decline in aggregate short sales as a percent of total volume--i.e., aggregate short sales have increased, but not as fast as overall volume. In addition, short selling by specialists has not increased as much as overall short sales. Exhibit 3 contains a time series plot of specialists short sales to average NYSE volume. Specifically, during the period 1971-1979 the weekly average of total short sales increased by about 110 percent, while the weekly average of specialists' short sales only increased by about 56 percent.

In summary, total trading volume has increased substantially, total short selling has likewise increased but not as fast as total volume, while specialists short sales have not increased in line with total short sales. The result is an overall decline in the ratio of total short sales to total volume and a coincident decline in the specialist short sale ratio.

Short Sale Ratio and Stock Prices

In order to avoid the effect of the secular trend in the short sale ratio, the analysis will concentrate on the relationship of troughs and peaks in the two series without considering absolute values. The comparison is between the short sales ratio in Exhibit 1 and the time series plot of the DJIA in Exhibit 4.

The short sale ratio reached a high point of 66 percent in September, 1971. At that time stock prices (i.e., the DJIA) were in the low 900's (about 910). Subsequently, stock prices declined to the low 800's in November before rising to over 1000 in late 1972. Because the short sale ratio never reached the 45 percent "trigger," the short ratio would not have indicated a buy before the rise to 1000. Subsequently, there was no clear indication of the stock market peak in January, 1973 since during that period the short ratio ranged from about 51 to 57.

In contrast, the short sale ratio provided a very strong buy signal in September, 1974 when it dropped to 38. At that time the DJIA was in the low to middle 600's. Subsequently, the stock market rose consistently to a high in excess of 1000 prior to its next decline. There was no obvious sell signal at the peak that extended through most of 1976 because the short sale ratio never exceeded 60.

Partially because of the secular decline in the short sale ratio, it appears that the short sale ratio could have given some false signals during May and September of 1977. During those months it declined below 40 indicating a buy signal. In both cases the market continued to decline. Again, the ratio gave a good buy signal in January-February, 1978 when it declined to its low point of the test period

(34). At that time the market was experiencing a trough at the mid 700's.

In summary, the graphical analysis indicated mixed results partially attributable to the declining secular trend in the short sale ratio. There was only one instance of a strong sell signal and that preceded a short decline. There were no sell signals at the other major stock market peaks. However, there were strong buy signals at two major market bottoms in September, 1974 and January-February, 1978. Finally, the ratio indicated false buy signals during 1977 when the market was continuously declining.

While the graphical analysis is mixed, the results are still encouraging enough to justify the examination of a trading rule. Because of the lack of sell signals, the analysis is confined to various purchase rules, assuming alternative holding periods.

TEST OF TRADING RULE

The test of a trading rule involves deriving a decision rule that is logical for buying and selling stock. Given the decision rule, it is necessary to consider commissions on all purchases and to examine the results compared to a buy-and-hold policy with adjustment for any risk differences.

Specification of Decision Rules

Ideally, one would like to specify a decision rule to acquire stock when the ratio declined to a given value (e.g., 40 or 45 percent) and hold the stock until you received a sell signal based upon an abnormally high short sale ratio (e.g., 60 or 65 percent). As an example one could

assume that he or she could buy stock when the short sale ratio declined below 45 percent and sell when the ratio rose above 60 percent.

As noted previously, the graphical analysis indicated almost no instances when the short sale ratio signalled a sale at the appropriate time. Therefore, we can not set forth a decision rule for the sale of stock and/or selling stock short to take advantage of a market peak. All the decision rules are concerned with the acquisition of stock and the automatic sale after alternative holding periods—e.g., one day, two days, one week, 13 weeks, etc.

Given the basic decision rules, the analysis is divided into three groups: 1) tests that analyze the results for individual investors who acquire stock after seeing the information in Barron's on Monday morning; 2) analysis of results for an investor who knows the short sale ratio one week prior to its publication in Barron's; and 3) analysis of results for the specialist who would purchase stock based upon knowing the short sale ratio the week it occurs (17 days before it is published).

Public Investor Signal. It is assumed that the public sees the short sale information in Barron's on Monday morning, 17 days after the ending week. We determine the average returns assuming a purchase at the open on Monday morning if the short sale ratio is 45 percent or less. We also examine returns assuming investors acquire stock whenever the ratio is 40 percent or less. The transaction is completed by the automatic sale of the stock at alternative ending periods (Monday close; Tuesday open; one week later; two weeks later; four weeks later; 13 weeks later; 26 weeks later and 39 weeks later). For each of these holding periods we compute the return on each transaction. Therefore,

we can derive a mean and standard deviation of returns, and determine
how many of the transactions were profitable. The analysis is repeated
using the four week moving average of the short sale ratio series.

Specialist Signal. In these tests it is assumed that the specialists
know the short sale ratio for the current week as of the close on
Friday night. Obviously this would be considered insider information
because it is not publicly available for 17 days. We test the results
assuming that the specialists buy at the close on Friday when the
short sale ratio declines to 45 percent or lower and alternatively they
buy when the ratio declines to 40 percent or lower. Again, the only
difference is in terms of the holding period after the purchase on
Friday.

Results for Individual Investors

Table 1 contains the results for an investor who acquired stock
every week when the short sale ratio declined to 45% or 40%. The table
contains results for three points of purchase--at the open on the Monday
the ratio appears in Barrons, at the close on that Monday, and the open
on the following Tuesday. For each purchase, we examine the average
results for alternative holding periods from one day to nine months (39
weeks). As seen in Table 1, the short sale ratio was 45 percent or less
during 168 of the 468 weeks of the sample period, and was below 40 per-
cent during 62 weeks.

Table 2 contains the same information except we examined the returns
using the four week moving average of the short sale ratio series. As
mentioned earlier, the averaging process smooths the series and possibly

TABLE 1

RESULTS FOR INDIVIDUAL INVESTOR ACQUIRING STOCK
WHEN SHORT SALE RATIO DECLINES TO SPECIFIED LEVEL

A. Short Sale Ratio Below 45% (n=168)

Purchase at:	Monday Open	Monday Close	Tuesday Open	Positive Returns
Sale at:	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	(Percent)
Monday Close	.0002 (.0087)	--	--	51.2
Tuesday Open	.0007 (.0146)	--	--	50.0
One week	.0000 (.0261)	.0003 (.0243)	.0006 (.0273)	50.0
Two weeks	.0026 (.0333)	.0022 (.0335)	.0023 (.0354)	55.1
Four weeks	.0011 (.0473)	.0006 (.0467)	.0005 (.0472)	48.8
13 weeks	-.0034 (.0822)	-.0035 (.0822)	-.0034 (.0818)	42.9
26 weeks	.0135 (.1301)	.0139 (.1299)	.0141 (.1291)	46.4
39 weeks	.0195 (.1472)	.0189 (.1460)	.0178 (.1456)	50.0

B. Short Sale Ratio Below 40% (n=62)

Purchase at:	Monday Open	Monday Close	Tuesday Open	Positive Returns
Sale at:	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	(Percent)
Monday Close	-.0019 (.0085)	--	--	40.3
Tuesday Open	-.0029 (.0115)	--	--	37.1
One week	-.0082 (.0250)	-.0052 (.0241)	-.0037 (.0238)	40.3
Two weeks	-.0066 (.0357)	-.0040 (.0373)	-.0030 (.0373)	43.5
Four weeks	-.0045 (.0456)	-.0016 (.0468)	.0015 (.0487)	43.5
13 weeks	.0064 (.0768)	.0073 (.0786)	.0077 (.0779)	51.7
26 weeks	.0357 (.1261)	.0367 (.1292)	.0368 (.1300)	53.3
39 weeks	.0339 (.1437)	.0357 (.1459)	.0356 (.1465)	62.7

TABLE 2

MEAN RETURNS FOR INDIVIDUAL INVESTORS WHO ACQUIRE STOCK WHEN THE
FOUR WEEK MOVING AVERAGE OF THE SHORT SALE RATIO DECLINES TO SPECIFIED LEVEL

A. Short Sale Ratio Below 45% (n=163)

Purchase at: Sale at:	Monday Open $\overline{X}$ (S.D.)	Monday Close $\overline{X}$ (S.D.)	Tuesday Open $\overline{X}$ (S.D.)	Positive Returns (Percent)
Monday Close	.0003 (.0091)	--	--	49.7
Tuesday Open	.0008 (.0149)	--	--	50.3
One week	.0009 (.0269)	.0007 (.0245)	.0005 (.0275)	53.1
Two weeks	-.0002 (.0342)	-.0007 (.0342)	-.0009 (.0362)	50.9
Four weeks	-.0026 (.0464)	-.0024 (.0458)	-.0023 (.0465)	42.2
13 weeks	-.0056 (.0748)	-.0061 (.0759)	-.0062 (.0763)	40.4
26 weeks	.0154 (.1320)	.0149 (.1335)	.0149 (.1338)	47.3
39 weeks	.0167 (.1452)	.0163 (.1445)	.0160 (.1440)	47.9

B. Short Sale Ratio Below 40% (n=40)

Purchase at: Sale at:	Monday Open $\overline{X}$ (S.D.)	Monday Close $\overline{X}$ (S.D.)	Tuesday Open $\overline{X}$ (S.D.)	Positive Returns (Percent)
Monday Close	.0007 (.0092)	--	--	42.5
Tuesday Open	.0092 (.0119)	--	--	47.5
One week	.0027 (.0269)	.0039 (.0257)	.0043 (.0244)	50.0
Two weeks	.0064 (.0316)	.0077 (.0354)	.0081 (.0367)	55.0
Four weeks	.0091 (.0391)	.0090 (.0420)	.0116 (.0444)	47.5
13 weeks	.0181 (.0655)	.0188 (.0679)	.0187 (.0693)	62.5
26 weeks	.0512 (.1206)	.0490 (.1191)	.0477 (.1201)	67.5
39 weeks	.0437 (.1494)	.0422 (.1455)	.0406 (.1457)	70.0

avoids the impact of a one week blip that is quickly reversed. As shown, the number of transactions was about the same for the 45 percent ratio (163 vs. 168), but there were clearly fewer instances of a decline below 40 percent using the four week average (40 vs. 62).

Because the results in the two tables are quite similar the discussion will concentrate on the results contained in Table 2 because these are better in terms of the trading rule. Note that there is very little difference in the results for alternative purchase points (i.e, Monday open versus Tuesday open). All the mean return results when the ratio was below 45 percent were insignificantly different from zero based upon a t-test. Even ignoring the statistical tests, the mean returns were either negative or generally so small (the highest was .0167) that the returns available to the investor after commissions would have been close to zero or negative depending upon the assumed commission rate.

The typical assumption of a 2 percent commission charge for the round trip transaction would indicate negative results. These inconsequential results are confirmed by the results in the last column which indicates what percent of the individual transactions provided positive returns.[5] All the figures were either less than 50 percent or insignificantly above it.

The results when the short sale ratio was below 40 percent were clearly better than the 45 percent results. Even so, none of the returns were significantly above zero. Beyond the statistical results,

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[5] Because the results for alternative purchase points are very similar, the percent positive is always based upon the Monday open results.

the average returns for all holding periods less than 26 weeks were not

large enough to provide profits after commissions. These results were

confirmed by the "percent positive returns" figures that were not

significantly different from 50 percent. In terms of the average price

changes, the returns from a trading rule that assumed a holding period

of 26 and 39 weeks were encouraging. In these instances, more than

half the transactions were positive and the average return was between

4 and 5 percent which would allow a profit after commission. These

results are better than those reported in Table 1 without the four week

average.

It is important to compare these to average market returns over

this same period--i.e., the average price changes for all 26 and 39

week holding periods. The average holding period return for every

possible 26 week period from January, 1971 to December, 1979 was .0032

(standard deviation of .0015). When we compare this to the average

return assuming a purchase on Monday morning of .0512 (standard devia-

tion of .1206) we see that there is not a statistically significant

difference in the mean returns. For the 39 week periods, the average

holding period return for all possible periods was likewise .0032

(σ = .000018). Comparing this to the Monday open result of .0437

(σ = .1494) likewise indicates that there is not a significant dif-

ference in these mean values. Therefore, one must conclude that using

this trading rule does not provide a rate of return that is signifi-

cantly different from a simple buy and hold policy.

Individual Investors with Inside Information

While the initial results indicate that it is generally not possible to derive superior returns using the short sale ratio, one might speculate that prior knowledge of the ratio would be of value. Tables 3 and 4 contain the results for an investor who would invest assuming knowledge of the short sale ratio a week prior to its publication in Barron's. We only consider one, two, and four weeks because we assume any benefit should come in the very short run.

The results in Table 3 do not provide any support for the short sale ratio as an investment tool--even for someone who is aware of the ratio before it is published. Almost all the mean returns are negative and the percent positive returns indicate that typically less than half the trades were profitable.

The results in Table 4, where the four week moving average is used, are better than the results in Table 3, but still they do not provide much encouragement for the short sale ratio. In this case, there are more positive mean returns, but none of them are statistically significant. Beyond this, none of the returns would provide a profit after considering commission. Notably, these results are inferior to comparable results reported in Table 2 where no prior information is assumed.

In summary, these results which assume prior information clearly do not support the use of the specialists short sale ratio as an investment tool.

Results for Specialists

The results in Table 5 indicate that not even a specialist who knew the short sale ratio as of the ending week could derive superior returns.

TABLE 3

RESULTS FOR INDIVIDUAL INVESTOR WHO ACQUIRES STOCK
THE WEEK BEFORE A DECLINE IN THE SHORT SALE RATIO IS PUBLISHED

A. Short Sales Ratio Below 45% (n=168)

Purchase at:	Monday Open	Monday Close	Tuesday Open	Positive Returns
	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	(Percent)
Sale:				
One Week	-.0012 (.0258)	-.0012 (.0229)	-.0011 (.0258)	48.8
Two Weeks	-.0016 (.0333)	-.0011 (.0329)	-.0008 (.0348)	47.9
Four Weeks	-.0004 (.0448)	-.0004 (.0442)	-.0008 (.0451)	48.2

B. Short Sale Ratio Below 40% (n=62)

Purchase at:	Monday Open	Monday Close	Tuesday Open	Positive Returns
	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	(Percent)
Sale:				
One Week	.0028 (.0303)	.0001 (.0265)	-.0020 (.0279)	50.0
Two Weeks	-.0054 (.0385)	-.0051 (.0356)	-.0057 (.0366)	46.8
Four Weeks	-.0001 (.0497)	-.0002 (.0475)	-.0016 (.0483)	43.5

TABLE 4

RESULTS FOR AN INDIVIDUAL INVESTOR WHO ACQUIRES
STOCK THE WEEK BEFORE THE DECLINE IN THE FOUR
WEEK MOVING AVERAGE SHORT SALE RATIO IS PUBLISHED

A. Short Sales Ratio Below 45% (n=163)

Purchase at:	Monday Open	Monday Close	Tuesday Open	Positive Returns
	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	$\overline{X}$ (S.D.)	(Percent)
Sale:				
One Week	.0004 (.0264)	.0002 (.0241)	.0003 (.0271)	50.0
Two Weeks	.0010 (.0348)	.0007 (.0345)	.0006 (.0364)	52.8
Four Weeks	-.0015 (.0477)	-.0015 (.0471)	-.0012 (.0479)	44.7

B. Short Sales Ratio Below 40% (n=40)

Purchase at:	Monday Open	Monday Close	Tuesday Open	Positive Returns
	X (S.D.)	X (S.D.)	X (S.D.)	(Percent)
Sale:				
One Week	-.0024 (.0320)	-.0019 (.0289)	-.0007 (.0272)	42.5
Two Weeks	.0002 (.0390)	.0020 (.0389)	.0036 (.0386)	47.5
Four Weeks	.0054 (.0402)	.0068 (.0388)	.0082 (.0397)	45.0

TABLE 5

RESULTS FOR SPECIALISTS WHO ACQUIRED
STOCK BASED UPON ALTERNATIVE SHORT SALE RATIOS
THE END OF THE RELEVANT WEEK

Purchase at:	A. Short Sales Less than 45% (N=168)			B. Short Sales Less than 40% (N=62)		
	Friday Close		Positive Returns	Friday Close		Positive Returns
Sale:	$\overline{X}$ (S.D.)		(Percent)	$\overline{X}$ (S.D.)		(Percent)
Monday Open	-.0006	(.0044)	38.7	-.0006	(.0049)	41.9
Monday Close	-.0007	(.0104)	47.0	.0005	(.0105)	51.6
Tuesday Open	.0002	(.0156)	48.8	.0012	(.0131)	51.6
Monday Close: One Week*	.0005	(.0393)	49.4	.0001	(.0402)	46.8
Monday Close: Two Weeks*	.0025	(.0461)	48.5	.0012	(.0480)	45.2
Monday Close: Three Weeks*	.0012	(.0520)	46.4	.0052	(.0549)	45.2

Purchase at:	C. Four Week M.A. Short Sale Ratio Less Than 45% (N=161)			D. Four Week M.A. Short Sale Ratio Less Than 40% (N=40)		
	Friday Close		Positive Returns	Friday Close		Positive Returns
Sale:	X (S.D.)		(Percent)	X (S.D.)		(Percent)
Monday Open	-.0008	(.0039)	37.3	-.0006	(.0055)	40.0
Monday Close	-.0001	(.0097)	49.7	-.0006	(.0113)	42.5
Tuesday Open	.0007	(.0150)	49.1	-.0012	(.0138)	42.5
Monday Close: One Week*	.0008	(.0401)	50.0	.0022	(.0401)	42.5
Monday Close: Two Weeks*	-.0004	(.0471)	45.9	.0058	(.0455)	42.5
Monday Close: Three Weeks*	-.0014	(.0536)	42.1	.0075	(.0523)	42.5

*Number of weeks after publication.

This is true whether the investment covers the several days following
the period or several weeks, which includes the period after the short
sale ratio is announced. Specifically, none of the mean returns are
statistically significant, none of them approach one percent on an abso-
lute basis (seven of twelve are negative), and almost always less than
50 percent of the trades were positive.

SUMMARY AND CONCLUSION

Summary

One of the most widely used technical trading rules for tech-
nicians who want to "follow the smart money" is the specialists short
sale ratio. The historical decision rule has generally contended that
one should sell stocks when this short sale ratio rises significantly
above 55 percent (i.e., 60 and 65 percent) and buy stocks when it
declines to a value significantly below 55 percent (45 and 40 percent).
An analysis of the time series plot of this series indicated a secular
decline in the short sale ratio--i.e., it is currently fluctuating
about 50 or 45 percent rather than 55 percent.

An analysis of the graphical relationship between the short sale
ratio and stock prices provided mixed results. Using the historical
rule, there was only one sell signal. In contrast, there were several
buy signals but the implied results were mixed. The investment results
apparently would have been very good based upon the signals during 1974
and 1978, but there would have been rather poor results in 1977.

The result of the trading rule tests generally did _not_ support
the technician's rule. All the average returns for a wide variety of

holding periods from one day to nine months were not statistically dif-
ferent from zero. Beyond the statistics, most of the mean returns were
not large enough to cover transaction costs and typically only about 50
percent of the transactions provided positive returns. These results
were true for the typical investor who received the information from
Barron's 17 days after the end of the period, for an investor who knew
the information a week before it became public, and even for specialists
who knew about the ratio at the end of the relevant week.

Conclusion

These results provide support for the weak form efficient market
hypothesis which contends that stock prices reflect all market informa-
tion. It does not appear that investors can derive superior returns by
following the smart money as indicated by the specialists short sale
ratio. This obviously does not mean that the specialist does not derive
superior returns in his total market making function, only that others
cannot take advantage of this superiority by watching this ratio. As
always, it is necessary to recognize that these results only relate to
the rule as specified which is based on the generally accepted technique.

EXHIBIT 1

SPECIALIST SHORT SALES TO TOTAL SHORT SALES

PERCENTAGE

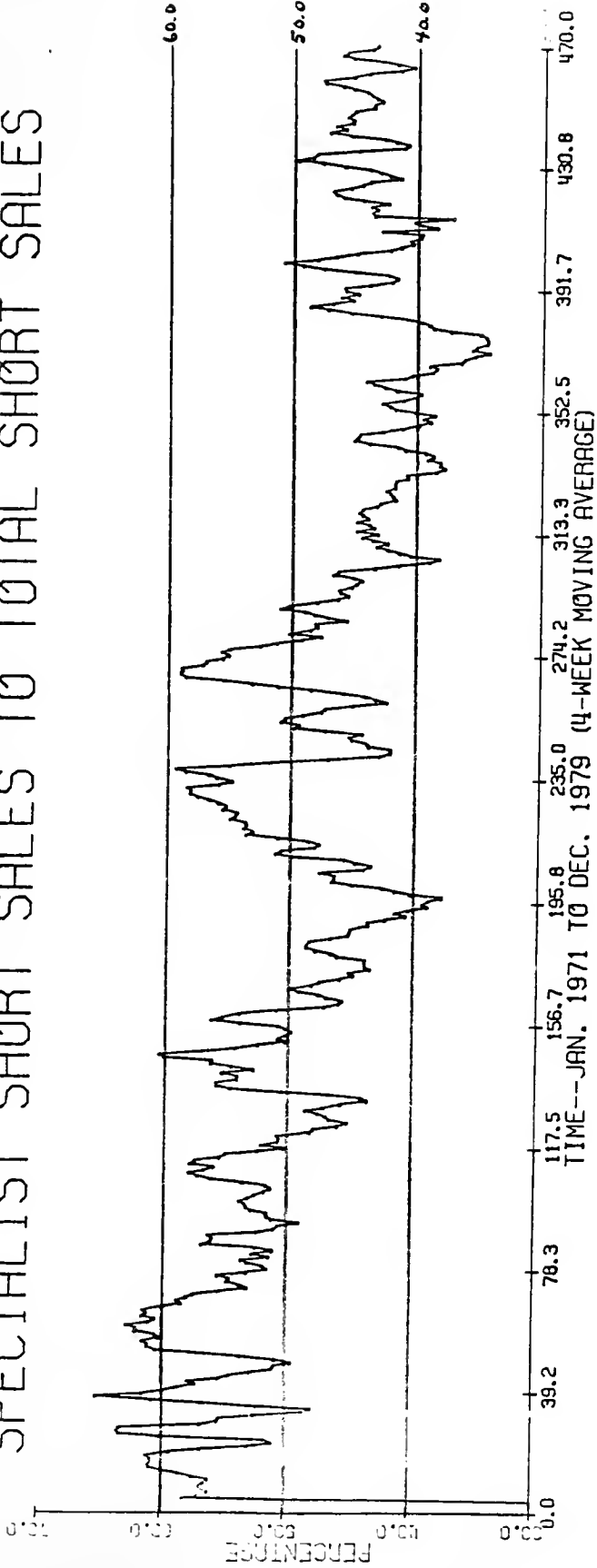TIME--JAN. 1971 TO DEC. 1979 (4-WEEK MOVING AVERAGE)

EXHIBIT 2
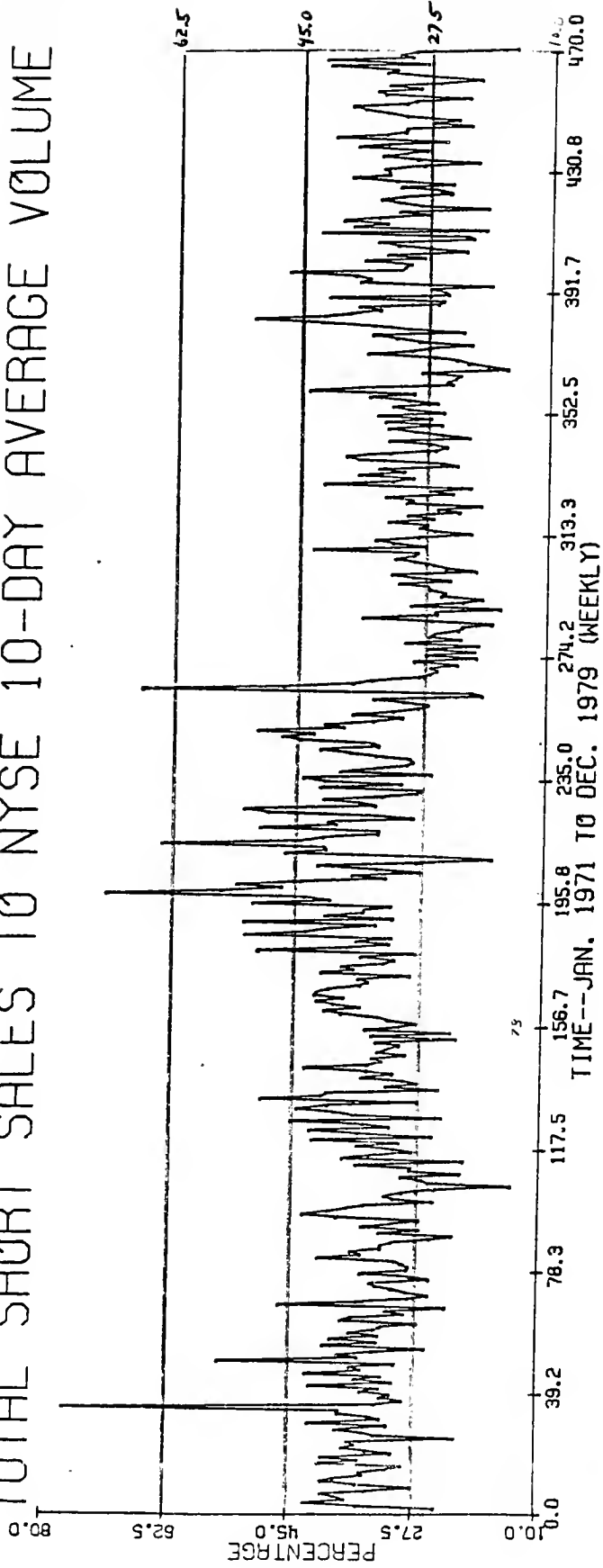

TOTAL SHORT SALES TO NYSE 10-DAY AVERAGE VOLUME

EXHIBIT 3
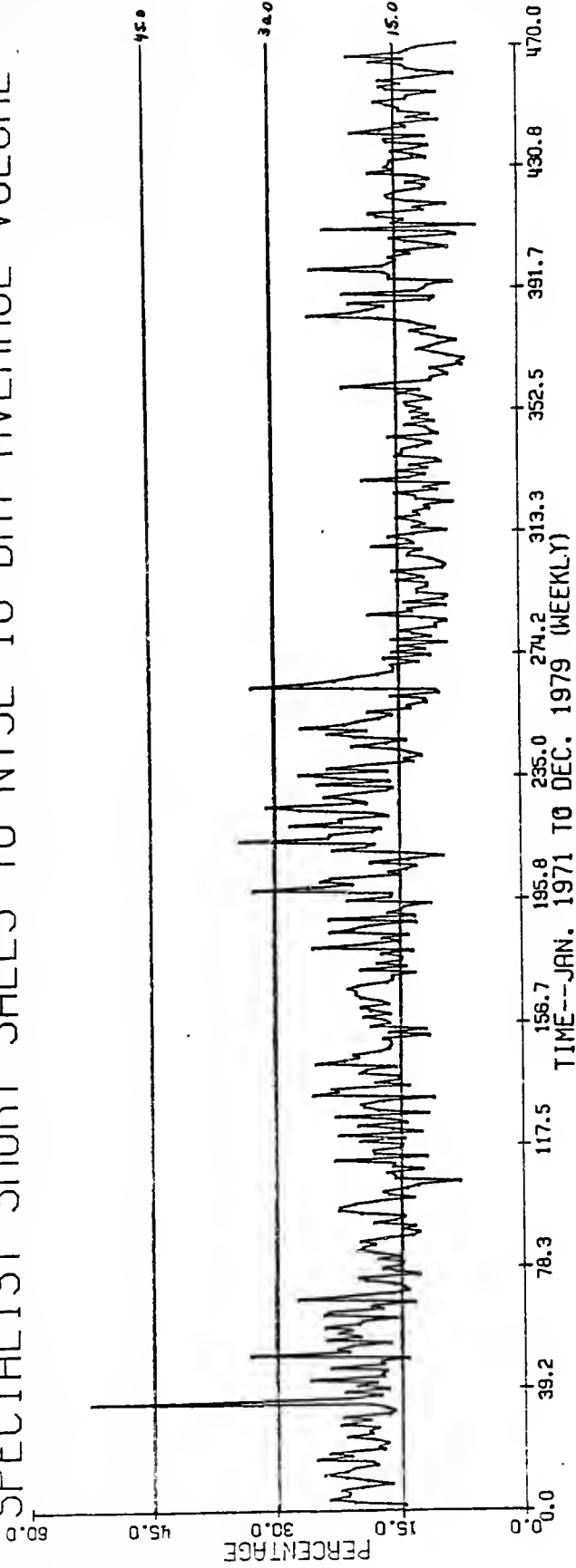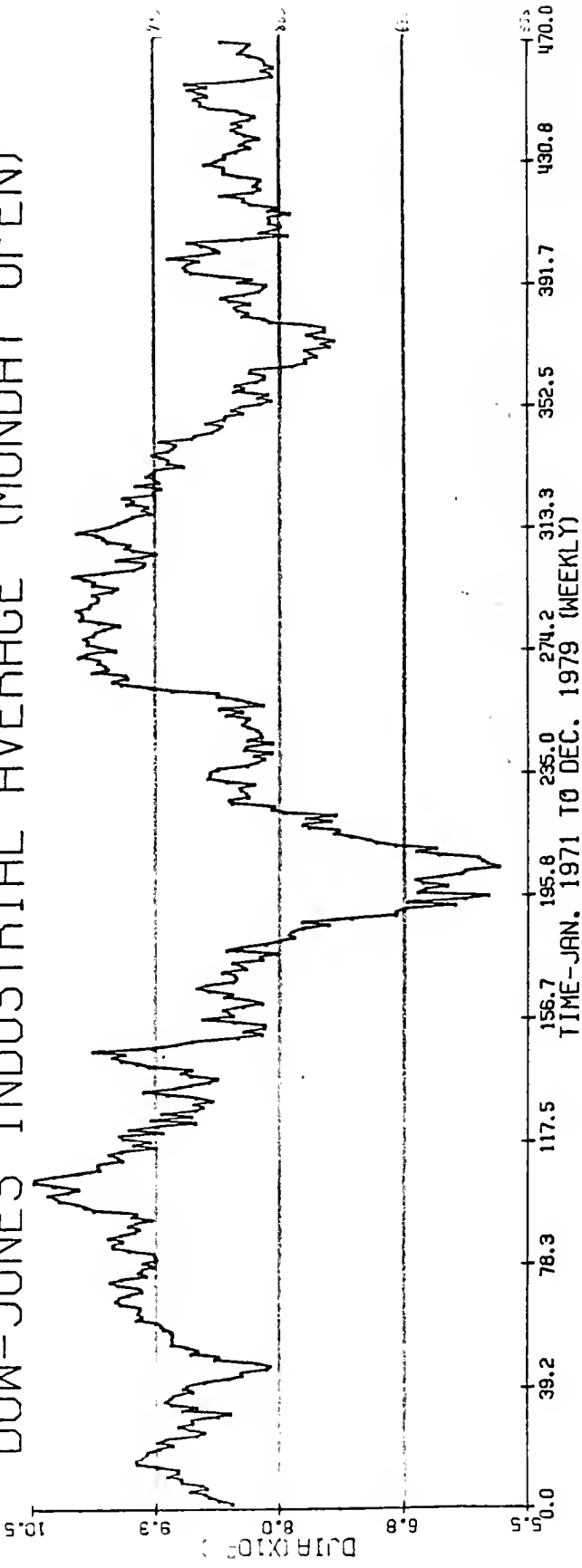

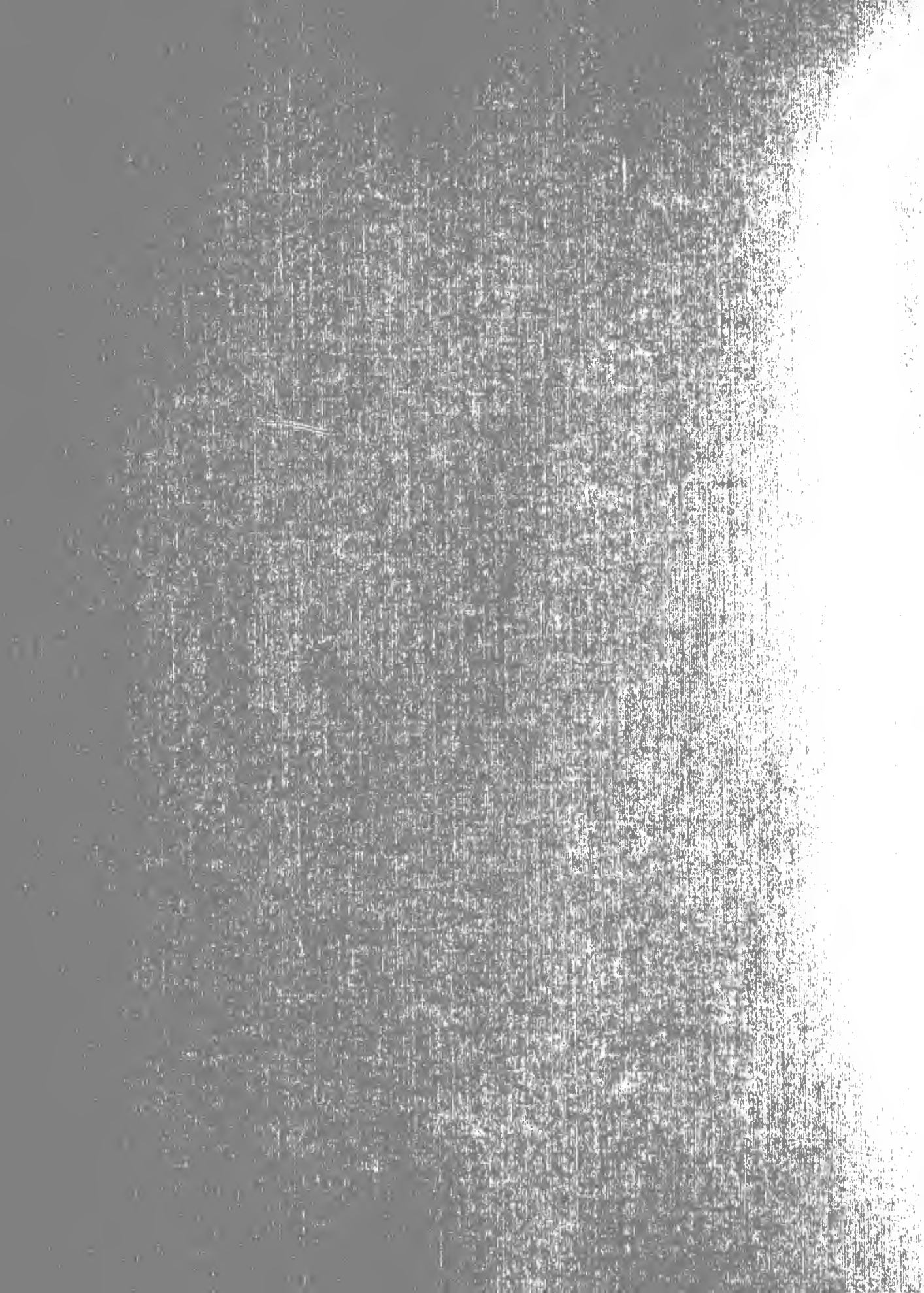SPECIALIST SHORT SALES TO NYSE 10-DAY AVERAGE VOLUME

EXHIBIT 4

DOW-JONES INDUSTRIAL AVERAGE (MONDAY OPEN)

TIME-JAN. 1971 TO DEC. 1979 (WEEKLY)