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Commission-Motivated Trading Patterns Of Brokers Across The Production Month

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The intramonth pattern of broker commission earnings is examined for a sample of one hundred brokers from a national brokerage firm. It is hypothesized that the structure of broker commissions leads to distortions in trading. The evidence shows that in the last five days of the production month, more than one-fourth of the brokers earned a significantly higher proportion of their monthly commissions than would be expected if trading were uniform across the month. This suggests that the structure of the commission system may lead some brokers to encourage individual investors to unnecessarily trade securities near the end of the production month to boost their commission income.

I. INTRODUCTION

The trading practices of individual brokers have not been investigated in the academic finance literature. An abundance of articles has been written on the pricing efficiency (or external efficiency) of financial markets and many articles have also focused on the operational efficiency (or internal efficiency) of these markets, by examining broker commissions and dealer spreads. However, little has been written about the trading behavior of brokers and dealers, and how their behavior may independently influence the trading patterns and the costs of trading for *individual* investors. It is possible that the trading behavior of brokers may have a significant impact on the welfare of the clients for whom they make trades. The trading behavior could additionally affect the profitability of the firms for whom the brokers are employed and the trading efficiency (or "inside" efficiency) of the financial markets in which they operate.

The purpose of the paper is to investigate whether individual brokers have an intramonth pattern of stock trading that is influenced by the structure of the commission system of

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compensation. To do this, we first examine the intramonth trading activity of individual brokers of a national brokerage firm, and second compare this to trading volume in the market as a whole. For the firm examined in this study, the empirical evidence suggests that more than one-fourth of the individual brokers studied do exhibit an unusual trading pattern that seems to be influenced by the commission structure. This leads to the questions of whether the trading activities of these brokers are always in the clients' best interests and whether the trading may sometimes be motivated primarily by a broker's desire to earn commission income. The latter would suggest that these brokers at times may be encouraging their clients to engage in unnecessary trading.

For the market as a whole, the evidence suggests that trading patterns are not uniform across the month, whether looking at total NYSE trading volume or odd-lot trading volume. We then examine the intramonth, broker-motivated trading relative to the identified intramonth pattern in NYSE trading. When this is done, about one-fourth of the brokers continue to exhibit a pattern of commission-induced trading.

Section II examines the motivations for individuals to trade securities and presents the results of previous research on trading volume. The methodology and data are explained in Section III. The empirical findings for a sample of brokers from a national brokerage firm are included in Section IV, and an analysis of NYSE total volume and NYSE odd-lot trading volume is in Section V. Section VI builds on the empirical findings of Section IV by comparing broker trading with NYSE trading volume. Section VII provides a summary and the implications of this research.

II. The Motivation for Trading and Trading Volume

The focus in this paper is on within-month stock trading. To gain a better understanding of individual trading and trading volume, we first review previous research regarding the motivations for trading securities and the empirical evidence on trading volume. This review illuminates what type of distribution of securities trading across a given month may be expected.

Several authors have attempted to identify the *motives for securities trading*. Treynor and Wagner (1990) classify traders according to four potential motives: value-based traders, information-based traders, pseudo-information-based traders, and liquidity-based traders. Admati and Pfleiderer (1988) develop a model of transacting that classifies traders as being either informed traders, discretionary liquidity traders, or nondiscretionary liquidity traders. Lakonishok and Smidt (1986) discuss tax-motivated traders. These models have been used to attempt to explain calendar price anomalies. For instance, the Admati and Pfleiderer model may help to explain intraday trading patterns. Foster and Viswanathan (1990) used a model that includes informed traders and liquidity traders to help explain interday trading. The Lakonishok and Smidt article focuses on turn-of-the-year effects. These articles have been primarily concerned with identifying trading motivations that might create unusual patterns of *returns*.

In a market where the flow of information and the liquidity needs of investors are randomly distributed, the volume of buy and sell orders should not be concentrated around any particular time within the month because buy and sell opportunities present themselves randomly across time. In such a world, the intramonth trading volume across the entire

market may be expected to be uniformly distributed across the month. Likewise, the dollar volume of an individual broker's trades also may be expected to conform roughly to a uniform distribution.

On the other hand, if the information flows or liquidity needs are concentrated in a pattern that regularly recurs across months, one would expect something other than a uniform distribution of intramonth trading. Thompson, Olsen, and Dietrich (1987) show that seasonalities exist in the flow of information. In their study, information flows varied across days of the week and across months of the year, but they did not examine intramonth information flows. However, their results suggest that some seasonalities in the flow of information across the month could exist as well. If information flows are not uniform across the month, the pattern of intramonth trading volume would not be expected to be uniform. In this case, the pattern of individual broker trades across days of the month may be expected to be similar to the intramonth pattern of trading in general.[1]

Studies of *trading volume* have focused on the relationship between equity returns and trading volume. For example, Karpoff (1987) reports that previous studies suggest that a rise in trading volume is associated with large absolute price changes, that the correlation between volume and price changes is positive, and that volume is higher when prices increase than when prices decrease. Gallant, Rossi, and Tauchen (1992) confirm the above findings and find that large price movements (both positive and negative) are followed by high volume. Pettengill and Jordan (1988) find that there are seasonal patterns in trading volume similar to return seasonalities. Further, they report that their tests suggest that there is a strong positive relationship between trading volume and return and that causality tests indicate that higher volume leads to higher returns (especially for smaller firms). Little work has been done regarding trading volume alone, other than the construction of models to explain volume, such as Karpoff (1986).

In the literature regarding *seasonal return anomalies*, some work has been done to test if there are any systematic return patterns associated with the months of the year. Several authors (e.g., Jones, Pearce, & Wilson, 1987; Roll, 1983) report a turn-of-the-year (or January) effect. Ritter (1988) provides an explanation of the turn-of-the-year effect for small stocks. Ariel (1987, 1988) reports that within-month returns are positive for the first two weeks of the month and negative for the second two weeks. Lakonishok and Smidt (1988) find a strong turn-of-the-month effect for equities around the end of each month. Pettengill and Jordan (1988) find higher returns in the first and last few trading days of each month. They, also, find higher returns in the first two weeks of the month and negative returns in the third week. They say the negative third week returns are related to the expiration of options.

None of the above models or empirical work have suggested that brokers' motivations and activities have an effect on trading volume. To a great extent, the models have been formed to attempt to explain well-documented empirical return anomalies. Our hypothesis, in contrast, identifies the broker commission system as a motivating source of broker trading activities within each month and tests if individual broker trading follows this pattern.

III. Methodology

We hypothesize that trading activity may be biased; that is, some brokers may have an uncharacteristically large portion of their trades concentrated within a few days of the month.

This trading pattern may occur because of the incentive compensation system used in most brokerage firms. Brokers are paid on a monthly commission basis; as the end of the "production month" nears, they are under pressure to meet commission goals that they have personally set or that have been set for them by superiors.[2] This may lead some brokers to attempt to increase their level of trading activity near the end of the production month, particularly those whose commission production is lagging far behind expectations (or quotas).

Most national brokerage firms pay their individual brokers once a month; this pay is based largely, if not entirely, on commissions generated. All commission trades that "settle" by the last day of the month are normally used to determine the commission income paid to the broker in the following month.[3] A significant portion of the commission dollars earned by most brokers comes from stock trades. Because stock trades allow five trading days for settlement, only those commissions from stock trades that occur on or before five trading days prior to the last day of the month contribute to the next paycheck to be received. Brokers who are under pressure to meet their monthly commission goals must trade stocks on or before the next-to-last Friday in a given month if they wish to boost that month's commission production from stock trading. Commissions earned on other trades that must be settled more promptly may be generated during the final week of the month and still boost the following month's paycheck.

Our hypothesis is that this commission payment system leads some individual brokers to a pattern of trading in which a high proportion of their stock trading for clients occurs in the few days on or before the end of the production month. While many brokers are very diligent about serving their customers' needs on a day-to-day basis throughout the month, some may not be as diligent. The less diligent brokers may tend to be somewhat lazy in finding new accounts and reviewing existing clients' portfolios during the first few weeks of a production month but will suddenly become very active on behalf of their clients during the final week of the production month in order to generate "sufficient" commission revenue.[4] Further, this tendency is much more likely to show up with brokers who service accounts for individual investors as opposed to institutions. Institutions rely much less on brokers' advice, whereas, many individuals trade primarily on the advice of their brokers. The focus here is on *stock* trading, rather than *all* trading, because the pattern of trading we are hypothesizing is more likely to be evident in the trading of stocks for which a broker may feed "hot tips" to clients to generate trading. The trading of other assets such as bonds or mutual funds is less likely to exhibit this pattern because their trading is normally not as lucrative to brokers and is not done as much on the basis of "hot tips."

To test this hypothesis, we obtained daily brokerage commission data on the stock trades for a random sample of brokers from one of the nation's leading brokerage firms. The data include the daily brokerage commission production earned on stock transactions for each of 100 randomly selected brokers.[5] The data cover a two-year period from the last week of August 1990 through August 1992. In addition, daily data were collected on NYSE total trading volume and on odd-lot purchases and sales for the same two-year period using *Barron's* and the Standard & Poor's *Daily Stock Price Record.*

The data are grouped into 24 "production months" over the two-year period. For each month, day 1 is identified as being the last trading day of the production month (i.e., five trading days before the last trading day of the calendar month). Day 2 is the trading day before day 1; day 3 is two trading days before day 1, and so forth back to day 19. This

provided us with a 19-day period for the analysis, day 1 back through day 19. (Most months had more than 19 days in a production month, but the inclusion of more days in some months would make the data analysis particularly difficult when averaging across days of the month.)

The hypothesis is tested in two parts. In section IV, we assume that information flows are random across the month and that one may expect the intramonth pattern of broker trades to be uniform. In Section V, we assume that there may be seasonalities in information flows, that these seasonalities are reflected in NYSE trading volume, and that we may expect the pattern of broker trading to be similar to the pattern reflected in NYSE trading.

IV. Individual Broker Trading Activity

To perform the empirical tests, we first calculate the proportion of total commissions that each of the 100 brokers in the sample earned in each of the 19 days of each "production month." For each day of the month, the commissions earned by each individual broker are expressed as a proportion of that broker's total commissions. For example, $p_{i,j,k}$ is equal to the proportion for broker i on day j during month k:

$$p_{i,j,k} = dc_{ijk}/tc_{ik}, \tag{1}$$

where dc_{ijk} is the daily commission for broker i on day j during month k, and tc_{ik} is the total commission for broker i during month k.

Next, the average proportion for each of the nineteen days ($p_{i,j}$ is the average for broker i on day j) is calculated for each broker by averaging across the 24 months of data, using:

$$p_{i,j} = \sum_{k=1}^{24} p_{i,j,k}/24. \tag{2}$$

These averages appear in columns 2 through 8 of panel A of Table 1 for seven of the 100 brokers in the sample. (These seven brokers are the ones who, on average, earned the highest proportions of their monthly commissions in the last week of the production month.) The final column in panel A provides the combined data for all 100 brokers in the sample by showing the average proportion of monthly commissions earned across the sample.[6]

If trading is uniformly distributed across the 19-day commission month, one may expect about 1/19th (or 5.26%) of the brokers' total 19-day commissions to be earned each trading day. Thus, the null hypothesis in this section is that the proportions are equal to 5.26%. The alternative hypothesis is that near the end of the commission month, these proportions are greater than 5.26%, as brokers try to meet their commission goals.

A t-test is used to test if the numbers in panel A of Table 1 are significantly different from 5.26%. For example, we test whether the 19.25% for broker 1 on trading day 1 is significantly different from 5.26%. The sample standard deviation, across the 24 day 1s for the commission proportions of broker 1, is 23.82%. The t-value for this test is 2.88, where t is found by:

$$t = (19.25 - 5.26)/(23.82/\sqrt{24}) = 2.88. \tag{3}$$

Using a one-tailed test, this t-value suggests that the commission proportion of 19.25% is significantly different from the hypothesized value of 5.26 at the 1% level of confidence.

TABLE 1

Percentage of Total Monthly Commissions Earned by Individual Brokers During the Last Week of the Production Month

Numbers in the columns are the average percentage of total monthly commissions earned by that broker on the trading day (panel A) or the group of trading days (panel B) listed in the first column. Trading day 1 is the last day of the production month, trading day 2 is the next-to-last day, and so forth.

Trading Day	*Broker 1*	*Broker 2*	*Broker 3*	*Broker 4*	*Broker 5*	*Broker 6*	*Broker 7*	*Average of 100 Brokers*
Panel A: Single Trading Days								
1	19.25*	8.06	17.32*	14.39*	1.97	11.36**	6.94	6.16*
2	6.36	12.45**	6.60	10.05**	8.06	5.52	7.93	5.72**
3	9.36	9.59	4.60	7.68	19.50**	10.84	6.62	5.66
4	10.64**	4.95	7.04	5.76	8.15	5.88	9.76	5.52
5	3.73	11.88	9.61**	4.80	4.01	7.34	9.16**	5.55
Panel B: Grouped Trading Days								
Last Few Trading Days								
2 days	25.61*	20.51	23.93*	24.44*	10.03	16.87*	14.87	11.88*
3 days	34.96*	30.10**	28.52*	32.12*	29.53**	27.72*	21.49	17.54*
4 days	45.60*	35.05**	35.57*	37.88**	37.68**	33.60*	31.25**	23.06*
5 days	49.33*	46.93**	45.18*	42.69*	41.69**	40.94*	40.41**	28.69*

Notes: * Significant at the 1% level, using a one-tailed test.
** Significant at the 5% level, using a one-tailed test.

Overall, for broker 1, the day 1 and day 4 proportions are significantly higher than the expected values. Each of the other brokers shown in panel A of Table 1 has daily averages that are higher than expected.

Similar calculations can be made using the average proportions across all 100 brokers, as shown in the final column of panel A. The table shows that an average of 6.16% of brokers' commission income was earned on day 1. This 6.16% for day 1 is significantly different (at the 1% level) from the hypothesized value 5.26%, with a t-value of 3.42. The day 2 value of 5.72% is also significantly higher for the firm (but at the 5% level of significance).

Panel B of Table 1 presents data by grouping the commission proportions into the last X trading days of the commission month. This data is used to test if brokers earned a higher than expected portion of their commissions in the last X days of the commission month. The null hypothesis is that for the last two, three, four, and five days of the commission month, the broker or firm should earn two-, three-, four-, and five-nineteenths, respectively, of total 19-day commissions. These hypothesized proportions are 10.53%, 15.79%, 21.05%, and 26.32%, respectively. The alternative hypothesis is that they tend to earn more than these proportions.

The evidence shows that these brokers did earn a significantly higher proportion of their commission income in the last week of the production month. For example, panel B of Table

TABLE 2

Number of Brokers Categorized by Proportion of Commissions in the Last Week of the Production Month

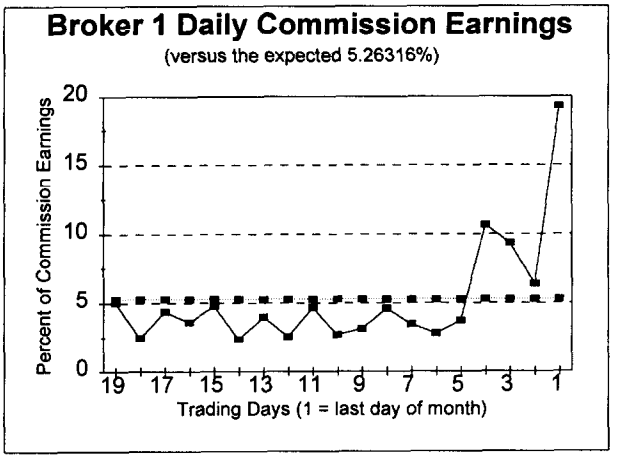
This table shows the number of brokers out of the total sample of 100 who fall into each category in the first column. The first column lists, by 5-percentage-point intervals, the possible percentage of commissions that each of the sample brokers could have earned, on average over the sample period, during the last week of the 19-day production month

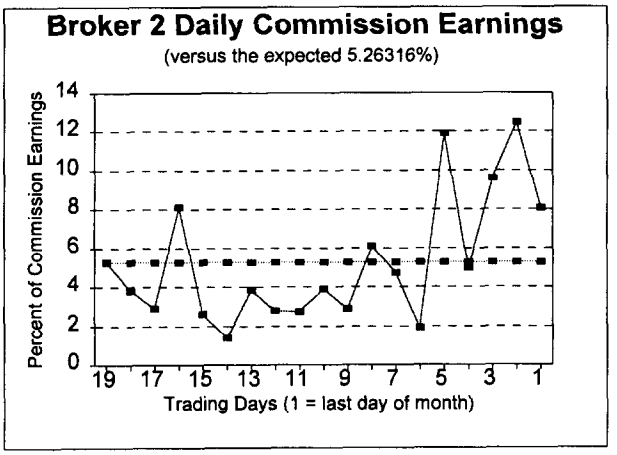
Proportion of Commissions Earned in the Last Week	*Entire Sample of 100 Brokers*	*Brokers with Significantly Higher Trading*
15 to 19.99%	1	
20 to 24.99%	14	
25 to 29.99%	40	
30 to 34.99%	25	9
35 to 39.99%	13	13
40 to 44.99%	4	4
45 to 49.99%	3	3
Total	100	29

1 shows that broker 1 earned, on average, 25.61%, 34.96%, 45.60%, and 49.33% of the total 19-day commission income during the last 2, 3, 4, and 5 days, respectively, of the production month. These are all significantly higher than their expected values, with t-values of 2.88, 3.09, 3.85, and 4.69, respectively. Further, most of the last X trading day averages for brokers 2 through 7 are significantly higher than the expected values, with all the five-day averages being statistically significant. Finally, the 100 broker averages for the last 2, 3, 4, and 5 trading days (from the final column) are 11.88%, 17.54%, 23.06%, and 28.69%, respectively, all of which are significantly higher (at the 1% level) than the expected values.

Table 2 provides summary data on all 100 brokers in the sample for the last 5 days of the production month. It shows that 29 of the 100 brokers had a "significantly" higher percentage of commission earnings in the last week compared to the 26.32% expected value. (Seventy-three of the 100 brokers had an average percentage higher than 26.32%, but only 29 were "significantly" higher in a statistical sense.)

The evidence from Tables 1 and 2 is strong enough that we may conclude that many brokers earned significantly higher proportions of their commission income in the last few days before the end of the production month. Further, the brokers as a group earned higher than expected commissions during this period. Overall, more than one-fourth of the brokers examined show a tendency toward a higher level of trading in the last week of the production month. Seven of the brokers (those shown in Table 1) earned more than 40% of their commission income, on average, in this last week. Figure 1 shows graphically the average intramonth trading of brokers 1 through 6 from Table 1. One broker earned nearly 50% of total monthly commission income in this five-day period. The data for the average of the 100 brokers show that, on average, the brokers earned nearly 29% of total 19-day commissions during the last five trading days.





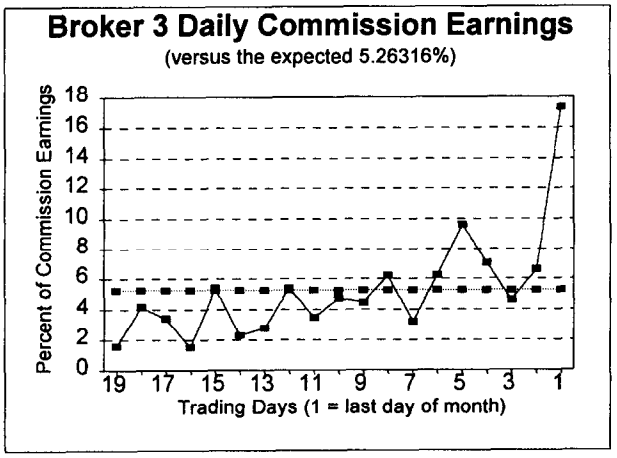
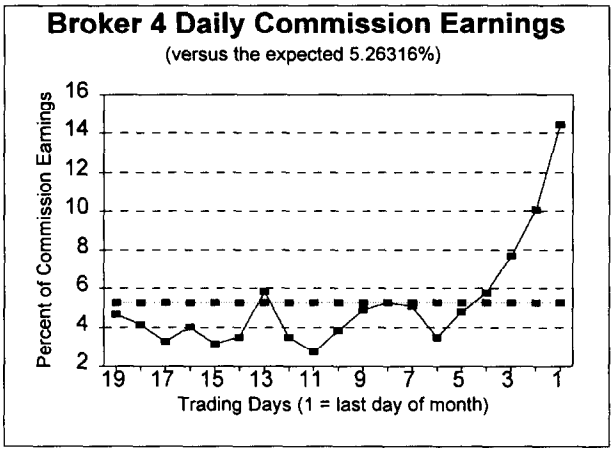
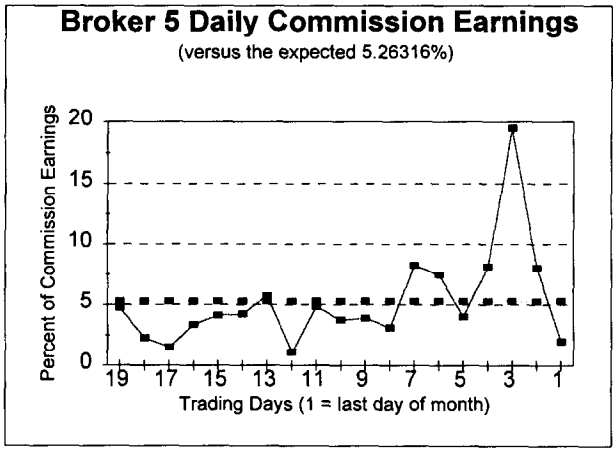


Figure 1. Daily commission earnings of brokers 1 through 6





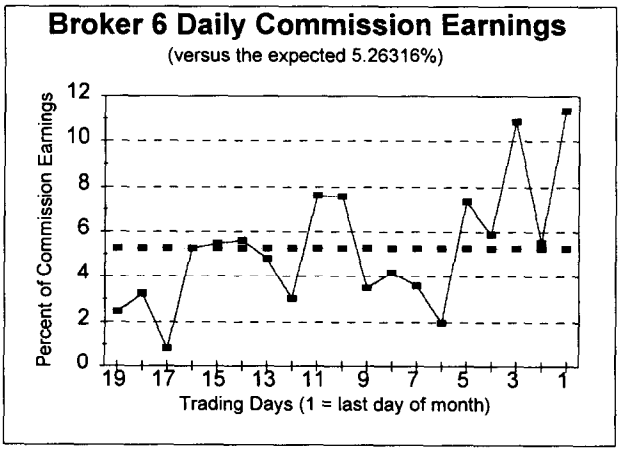


Figure 1. (*Continued*)

V. NYSE Total Volume and NYSE Odd-Lot Trading Volume

We now turn to the general stock market to see if there are any market-wide patterns of intramonth trading and, in particular, to see if trading increases toward the end of the production month. Both NYSE trading volume and odd-lot trading volume are examined for nonuniform tendencies. In the market in general, we must examine trading volume—rather than commission income as was done for individual brokers—since commission data is not available for the market.

Total NYSE trading volume is examined first. Our focus is on the intramonth pattern of this trading. Second, intramonth trading by individuals is examined by looking at odd-lot trading—a proxy for individual trading. Lakonishok and Maberly (1990) suggest that odd-lot trading may serve as a proxy for individual trading since few institutions engage in odd-lot trading. Odd-lot "purchases" should be particularly instructive because institutions generally do not *purchase* odd lots. However, odd-lot "sales" may not be as good a guide to individual trading activity because of a significant volume of institutional sales. Though institutions do not purchase odd lots, they must sell odd lots that they acquire through stock splits, stock dividends, and conversions of convertible securities.

The market-wide data are presented in Table 3. The NYSE volume data suggest that the volume of trading is approximately even across the month, but there does appear to be a tendency for volume to be higher near the end of the commission month. Statistical tests suggest that approximately 1/19th of the trading volume occurs on each of the 19 trading days in the commission month. For example, panel A shows that only the day 3 proportion of 5.66% is significantly greater than the expected 5.26% (or 1/19th) at the 1% level of significance, having a t-value of 2.84. (The day 5 value of 5.55 is significantly different only at about the 10% level of significance.) None of the other daily NYSE volume proportions are significantly different from 5.26%.

However, looking at the last X trading days data in panel B of Table 3, all the percentages are above those of a uniform distribution (10.53%, 15.79%, 21.05%, and 26.32%), and two of the four are statistically significant at the 5% level. In the last week of each production month, 27.33% of the NYSE monthly trading volume took place. This proportion is significantly higher than the 26.32% expected value (the t-value of the test is 1.92). Overall, the NYSE volume data provide evidence the general trading volume is higher than expected near the end of the production month. This higher level of trading could be due to increased broker activity near month-end, to higher information flows near month-end, or to some other unexplained factor.

The NYSE odd-lot trading data also provide evidence of uneven intramonth trading. Panel A of Table 3 shows that the proportion of daily odd-lot purchases and sales is greater than 5.26% for each of the last five days of the production month. However, only two of these are significantly different from 5.26%. Looking at the last five trading day proportions in panel B, both the odd-lot purchase and odd-lot sale proportions are significantly higher (at the 1% and 5% levels of significance, respectively) than the expected value of 26.32. The odd-lot purchase proportions are somewhat higher than those for odd-lot sales and support the suggestion that odd-lot purchases better reflect the level of individual trading than do odd-lot sales. The odd-lot purchase results shown in Table 3 also support the hypothesis that higher trading around the end of the production month may have occurred in brokerage firms other than the single firm examined in this paper.

TABLE 3
Percentage of Total Monthly Trading in the Stock Market
During the Last Week of the Production Month

Numbers in the columns are the average percentage of total monthly trading in that market on the trading day (panel A) or the group of trading days (panel B) listed in the first column. Trading day 1 is the last day of the production month, trading day 2 is the next-to-last trading day, and so forth.

Trading Day	*NYSE Volume*	*Odd-Lot Purchases*	*Odd-Lot Sales*
	Panel A: Single Trading Days		
1	5.39	5.53	5.35
2	5.48	5.44	5.49
3	5.66*	5.74*	5.50
4	5.26	5.64	5.32
5	5.55	5.52	5.51
	Panel B: Grouped Trading Days		
Last Few Trading Days			
2 days	10.86	10.97	10.84
3 days	16.53**	16.72*	16.34
4 days	21.78	22.36*	21.65
5 days	27.33**	27.88*	27.16**

Notes: *Significant at the 1% level, using a one-tailed test.
** Significant at the 5% level, using a one-tailed test.

VI. Broker Trading Activity Versus NYSE Trading Volume

The data in Table 3 indicate a slight increase in general market trading at the end of the production month. One explanation for this intramonth seasonality in overall trading could be that it is caused by the commission-motivated trading we have identified. This possibility seems unlikely, however, since our data reflect transactions made by individual customers of brokerage firms, which are only a small proportion of overall trading. (Trading by individuals for 1993 was less than 20% of total NYSE volume.)

Another explanation for intramonth seasonality of overall volume might be that there is a pattern of intramonth seasonality in information, although, as discussed above, we know of no published research that substantiates this conjecture. There may also be other exogenous, unknown factors that contribute to the volume seasonality. Regardless of the underlying cause, we will now treat the seasonality in the overall volume as the null hypothesis against which to test our observed pattern of broker trading. If we find that the observed pattern of broker trading is significantly different from the pattern of overall trading, we can conclude that the broker trading pattern is *not* caused by the exogenous factors affecting overall trading, such as possible information seasonality. Therefore, instead of using 1/19th (or 5.26) as the expected value (as was done in Section III), we now use the actual NYSE volume percentage for that day, as shown in the second column of panel A in Table 3. (We use the NYSE trading volume data as a reflection of the trading patterns expected of brokers, rather than the odd-lot trading percentages, because the NYSE trading may better reflect the many factors that affect securities trading patterns.) The t-test shown in Equation (3) (for broker 1 on trading day 1) would become:

$$t = (19.25 - 5.39) / (23.82 / \sqrt{24}) = 2.85,$$

where 5.39 is the NYSE day 1 trading volume proportion. To test the significance of the proportion 6.16 for the average of 100 brokers for trading day 1 in Table 1, we can use the test:

$$t = (6.16 - 5.39) / (1.29 / \sqrt{24}) = 2.93,$$

rather than:

$$t = (6.16 - 5.26) / (1.29 / \sqrt{24}) = 3.42.$$

The new tests of significance for the 100 brokers for the last 2, 3, 4, and 5 trading days would be:

$$t = (11.88 - 10.86)/(1.93/\sqrt{24}) = 2.60,$$

$$t = (17.54 - 16.53)/(2.78/\sqrt{24}) = 1.78,$$

$$t = (23.06 - 21.78)/(3.41/\sqrt{24}) = 1.84, \text{ and}$$

$$t = (28.69 - 27.33)/(4.15/\sqrt{24}) = 1.61,$$

respectively.

These t-values are significant at the 1%, 5%, 4%, and 7% levels, respectively. Overall, the statistical significance of the values in Table 1 remains very high even when the NYSE volume percentages are used as the expected values in the t-tests. While 29 brokers had significantly higher trading during the final week, as shown in Table 2, the number falls to 24 when the NYSE trading volume percentages are used as the expected values. Thus, nearly one-fourth of the entire sample of brokers still shows significantly higher trading in the last week of the production month when this more restrictive test is used.[7] Therefore, even when it is assumed that the general level of trading is not uniform across the month—as a result of uneven information flows or other unexplained factors—commission-motivated trading seems to be taking place.

VII. Summary and Implications

This paper provides evidence that some individual brokers who work for a national brokerage firm earn an unusually high proportion of their stock commission income in the last week of the production month. The last five days of trading are characterized by an unexpectedly high volume of trading by several of the individual brokers and for the average of all brokers examined. This evidence suggests that a large number of the brokers in our sample may be engaging in "commission-motivated trading" in order to boost their commission income near the end of the production month. One is led to wonder how widespread this practice may be. In our limited sample, we find that about one-fourth of the brokers traded stocks for their clients more actively than expected during the last week of the production month. Seven of the 100 brokers showed particularly active trading, with more than 40% of their monthly commissions being earned in the last week of trading.

The broker behavior that has been observed in this paper by looking at a single national brokerage firm may be very widespread. Because most national brokerage firms have a commission payment system that is similar to that of the firm in this study, other brokers

may be behaving very much like the 29 brokers shown in Table 2. If about one-fourth of the brokers in one brokerage firm are encouraging individual investors to engage in what may be viewed as "unnecessary" trading near the end of the production month, how many more brokers across the nation are engaging in the same practices as they try to meet their commission quotas? Our discussions with brokers across the country suggest that this is widespread and is a natural occurrence, given the commission system and the tendency of many individuals to procrastinate.[8]

Because we have looked at a sample from only one national brokerage firm, it is impossible for us to draw general conclusions. However, the implications of the study are clear, and only further research can suggest how widespread this pattern of commission-motivated trading may be.

The findings in this paper have implications for brokerage firms, their clients, and financial markets. For brokerage firms, these trading patterns could affect their profitability to the extent that rather than having a relatively smooth flow of orders across the month, they have a more uneven flow. The brokerage firms may also be concerned about those clients who may be pressured into unnecessary trades by brokers who are trying to meet their quotas at the end of the month. In light of the findings, brokerage firms may wish to change the frequency of their evaluation of broker commission production from monthly to weekly or biweekly.

The implications are clear for individual investors (and the clients of other providers of financial services where the sales force is paid on a commission basis). The closer it gets to the end of the production month, the more wary investors should be about the advice they receive from their broker. While the broker trading patterns identified in this paper cannot be defined as "churning," the behavior leads to similar results—that is, a high level of unnecessary trading done to generate higher commissions for brokers.[9] The clients of brokers who have this tendency may be unknowing victims.[10]

For financial markets, this research may also be instructive. Many financial products are sold using a commission-paid sales force. If this system of pay distorts the trading pattern of financial assets or leads to more costly trading, it has implications for the internal efficiency of the financial markets and how these markets may best serve the needs of both the suppliers and demanders of capital. The regulators of these markets may have a particular interest in "protecting" unwary investors from unnecessary trading and in lessening distortions in the pattern of trading.

NOTES

1. It was suggested to the authors that a large segment of wage earners may be paid at the end of the month and that the flow of funds into institutions such as pension funds may be higher at month-end. While this may be true, funds do not immediately flow through the hands of investors directly into the stock market. Investors temporarily place funds into checking accounts, money funds, and other idle balances, and then move the funds into stocks at varying intervals over the coming month(s). Further, the date of pay from one employer to another is not uniform across the month, with a variety of pay schedules being followed. The flow of investable funds to institutional investors may be more lumpy across the month, but we know of no regular *monthly* trading patterns that arise from this flow.

2. We define a "production month" to be the period of time during which commissions earned will contribute toward the next paycheck. For stock trades, the production month typically ends one week prior to the last trading day of the month.

3. Some firms use the last Friday in the month rather than the last day of the month as the date that trades must "settle" in order to have the commissions included in the next paycheck.

4. The production of sufficient commission revenue is necessary for brokers to earn their expected income level and for most of them to keep their jobs. A brokerage firm's regional or national office generally defines what level of commission production is "sufficient." Those brokers who repeatedly fall short of this "sufficient" level will lose their jobs.

5. The data provided by the brokerage firm includes stock trades for a random sample of about 125 brokers. The sample was reduced to 100 brokers after taking out those brokers who traded stock infrequently or did not trade stock for more than a few months during the sample period.

6. An alternative way to construct the empirical tests in this paper is to look at average broker dollar commissions across days of the month compared to the average daily dollar commission, rather than looking at the percentage of commissions earned each day compared to some expected percentage. We did not use this alternative method because the potential for bias is greater when using actual dollars due to the fact that dollar commissions of brokers could be trending up or down over time. By stating each day's commission as a percentage of that month's total commission, we eliminate any influence from the other 23 months in the sample. Empirical tests were conducted using dollar commissions rather than percentages. These tests confirmed the results reported in Tables 1 and 2 by showing that about one-fourth of the brokers earned significantly higher commissions in the last days of the production month compared to the average daily dollar commission that they earned across the month.

7. In addition to the individual broker comparisons, the odd-lot trading averages in Table 3 may be compared to the NYSE volume percentages. When this is done, the odd-lot trading averages are not significantly different from the NYSE percentages.

8. A preliminary study conducted on 1986 and 1987 data from a single office of a national firm showed similar results to those reported here. That study showed that four of eight brokers traded more heavily than expected in the last week of the production month. One broker (who was reported to us by a colleague as engaging in a "feeding frenzy" in the last two days of production month) earned 30% of monthly commissions in the last two days and 53% of commissions in the last week of the production month, on average, over the two-year period.

9. "Churning," according to the SEC and court cases, is the excessive trading in a particular customer's account (usually a discretionary account) for the purpose of generating commission income.

10. Instead of churning a particular client's account, this paper suggests many brokers are "stirring up" unnecessary activity in many different accounts near the end of the production month. (One dictionary defines "churning" as a "violent stirring.") Perhaps we need to invent a term for this behavior to distinguish between intensive (one client) and extensive (multi-client) "churning."

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