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Rule 144 Volume Limitations and the Sale of Restricted Stock in the Over-The-Counter Market

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THIS RESEARCH analyses the impact of actual sales of unregistered securities in the Over-the-Counter Market under Rule 144 as promulgated by the Securities and Exchange Commission (SEC). Our intent is to examine the volume limitation provision of the rule and to determine the degree to which sales under the rule adversely impact on secondary trading markets.

After describing Rule 144, we develop data on actual transactions under the rule and the size of those sales relative to the legal ceilings and the trading volume typically observed for the securities in our sample. Our approach relies on the market model and the estimation of residuals on or about the actual sale date to determine if there are systematic effects across all firms, and by specific subcategories of sellers, which might reduce investor wealth in ways inconsistent with an efficient capital market and contrary to the interests of investors.

The results support the general view that there is no adverse impact on investor returns from actual sales of unregistered stock under Rule 144. The enlightened self-interest of selling shareholders with substantial holdings acts to curb any tendency for them to create any price pressure which could adversely impact trading markets. It would appear that the SEC was justified in relaxing the proposed rate of sale and volume limitation of Rule 144: on average and net of transaction costs, no potential investors have been made worse off and some sellers are made better off.

Nonetheless, the market disruption hypothesis implicit in the regulation of these sales cannot be completely dismissed for all vendor or issuer categories until the role of new information in these transactions is fully resolved. Preliminary findings suggest that sales in high technology issuers, and sales by those who acquired their stock in private placements deserve more careful attention than this focused analysis of the disruptive impact of these sales has provided.

I. Rule 144

In January 1972 the Securities and Exchange Commission adopted Rule 144. Promulgated under section 4(1) of the Securities Act of 1933, and written to

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codify certain staff practices regarding the distribution of securities outside of full registration, the rule provides a safe harbor for the resale of securities by any seller who acquired stock in a transaction not involving a public offering. Under these provisions, any affiliate of an issuer or other person who sells restricted stock is not deemed to be engaged in a *sub rosa* distribution of securities in violation of the Act, and is not an underwriter, provided the securities are sold in accordance with the terms and conditions of the Rule.[1]

The SEC maintains that the registration of securities intended for public distribution is necessary for the protection of investors. This is particularly true where distributions involve large increases in the amount of stock outstanding. Issuers, however, favor an unregulated sale of stock in order to avoid the costs of registration. Rule 144 is the result of the agency's attempt to balance the costs and benefits associated with these competing interests. The exemption from registration, however, was narrowly drawn. Sellers of restricted stock must still follow certain restrictive and costly procedures to reduce the probability of loss in investor wealth which might result from purchases of stock sold under Rule 144. The SEC expected that sales under the rule would likely be routine trading transactions, rather than unregistered distributions. These resales can occur only after a reasonable holding period and in ". . . such quantities and in such a manner as not to disrupt trading markets."[2]

II. The Volume Limitation and the Market Disruption Thesis

Rule 144 has always been controversial. Most observers believed that the volume restrictions seriously discouraged investments in young emerging companies and limited the liquidity available to early investors such as venture capitalists. The SBA Task Force [13] view is representative:

> ". . . Rule 144 is harmful in its effort to protect the market from selling pressure through quantitative limitations . . . that impede venture investing, are counterproductive to investor protection and promote concentration."[3]

Prior to the September 19, 1978 release, the Rule required that restricted securities proposed for sale be beneficially owned for at least two years. The amount sold in any six-month period could not exceed one percent of the class outstanding, or if traded on an exchange or NASDAQ, the lesser of that amount or the average weekly volume on all such exchanges and NASDAQ, during the four weeks preceding the sale. Sales were to be conducted in broker's transactions and all sellers were to file a notice of the proposed sale with the SEC. Moreover, adequate information about the company was required to be available to the investing public.[4]

[1] See SEC Release No. 33-5223 (January 11, 1972).

[2] SEC Release No. 33-5223, p. 18.

[3] See SBA Task Force [13], p. 8.

[4] The Rule also prohibited buy solicitations. SEC Release No. 33-5979 (September 19, 1978) substantially relaxed the volume limitations and manner of sale provisions for sellers of letter stock. Further relaxations for non-affiliates were announced in Release No. 33-6072 (March 5, 1979) who were now permitted to resell stock without regard to the volume limitations if certain holding period

Potentially disruptive and lasting market impacts of sales of unregistered stock have been advanced by the SEC as important reasons for the volume limitation. While there is no empirical basis for the actual restriction, the SEC is not alone in its belief that new sales of securities or large sales of stock relative to what might be considered normal trading quantities can only be sold at lower prices. The distribution hypothesis of Kraus and Stoll [8] or the price-pressure notion advanced by Scholes [10] suggest that new or unusually large quantities of stock can only be absorbed in the market at lower prices. This fall in price, albeit temporary indicates that a disruptive sale has occurred. The volume limitation on proposed resales is designed to prevent these effects. This I call the market disruption thesis. Overlooked, as we shall see, is the difference between what is proposed and what can be sold given market conditions.

Haworth and Tuck [4] provide the first analysis of the market impact of Rule 144 sales. Utilizing a sample of 155 NYSE and AMEX exchange listed stocks, they find no significant effects. A sub-sample of large-size transactions (large in the sense that Rule 144 share volume was at least 86% of the reported daily volume) confirmed their earlier result, and like Scholes [10], they find that the demand curve for Rule 144 stock on the day of sale is essentially horizontal.[5]

A more recent study by Osborne [9] first focused attention on the information content in the public announcement of proposed Rule 144 sales. He finds the Over-the-Counter market semi-strong form efficient with respect to the announced information. Although this finding is important, the evidence reported by vendor classification is most interesting. It should be noted that the volume limitation was additionally intended to prevent insiders from profiting outside of registration as well. Since stock sold under Rule 144 is often owned by affiliates of the issuer, sales by such persons might be informative since market participants are always looking for information not already impounded in asset prices. On this point, Osborne found evidence of abnormal returns, gross of transaction costs, to sellers of high-technology issues and to those who acquired their stock in private placements in the week prior to the announced sale. For affiliates of the issuer the abnormal returns were small in the test period thereby limiting trading strategies based on this information. While the Osborne evidence of information leakage is consistent with the results of Jaffe [5, 6] and Finnerty [7] regarding the ability of insiders to earn short-run profits, and outperform the market, it is not definitive. Rule 144 sales may disrupt trading markets but they are equally likely to be informational and thereby subject to the SEC regulations on insider trading.

The principal alternative hypothesis tested is this: Rule 144 sales are disruptive to OTC markets and so adversely affect returns available to investors. Sales by insiders might also be disruptive in the sense that a reduction in price may be necessary to absorb the greater than normal transaction volume.

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requirements are met. Additional further studies by this author will explore trading characteristics before and after the 1978 rule change. The volume limitation was relaxed to the greater of 1% of the shares outstanding or the average weekly trading volume in the month preceding the sale.

[5] The Haworth and Tuck [4] study utilized 1976 data with 47 of the proposed sales from corporate insiders. No effort, however, is made to isolate informational effects in that study. Included in their sample were 64 largest transactions from multiple transaction sales. Multiple transaction sales are excluded from this analysis.

III. The Data and Methodology

The basic data for this study is the various Forms 144 as filed with the Securities and Exchange Commission for each proposed sale of restricted stock. These forms disclose information about the seller, the securities to be sold and sales in the previous six months on the notice available on the SEC's Proposed Sale of Securities Data File.[6]

In 1977, there were over 15,000 proposed Rule 144 transactions with an aggregate market value of $1.35 billion. The median proposed sale was $23,0000 with a typical transaction size of 2500 shares. The majority of these transactions (52%) were proposed in securities traded in the Over-the-Counter market where the median number of shares outstanding for the company trade was about 3.5 million. Thirty percent of all transactions were by control persons (20%) and affiliates of the issuer. Most sellers (54%) had acquired their stock at least five years before proposed for sale. These data indicate that most of the stock to be sold was acquired in a private placement (41%) or as a result of a gift or settlement from an estate (21%).

A random sample of 1339 transactions proposed during 1977 in 770 different OTC traded equities was selected for analysis. In this group of 770 stocks, 570 had fewer than five sellers during the year while 67 securities had more than 15 different sellers. There were 211 securities in which there was only one proposed transaction.

All 1339 transactions were sent to broker-dealers of record for verification of the proposed sale information. Brokers were asked to review the transactions proposed and supply the SEC with actual sales dates, the number of shares sold, aggregate dollar volume where such sale information was different from that earlier reported on Form 144. For those proposed sales executed in more than one transaction, brokers were asked to note all transaction dates and amounts.

From this extensive data file we chose to analyse the 211 stocks in which there was one proposed transaction. Within that group we selected a sample of 110 stocks for which continuous daily price histories were available on the National Association of Securities Dealers Automatic Quotation system (NASDAQ) for at least 60 days before and after the sale date reported by the broker, and the sales all occurred on different dates. Lack of complete information about the seller and inconsistent or unverifiable data about the security reduced the sample to 98. It was further reduced to 66, when the market model parameters for 32 stocks were not significant. The final sample of 46 resulted after we dropped those transactions for which no actual sales were effected (12) and no trading volume or a discrepancy in the volume (8) reported on NASDAQ.

[6] It might be instructive to review how restricted stock under Rule 144 is sold. Typically an investor places a sale order with a broker through a seller's letter making various representations about the proposed sale of stock and his or her understanding of the rule together with three fully executed copies of Form 144. Among other things, the seller indicates the amount of stock to be sold; any sales in the six (now three) preceding months, any open orders with other brokers and if he had any put, calls or short positions in the stock for the previous year. He must disclose his relationship to the issuer and selling family members. It is then left to the broker to determine the best time to sell the stock. If the stock has not been sold for ninety days, the seller is required to file an amendment to Form 144 and propose another sale. The stock may not sell at all.

A. *Characteristics of the Sample*

The sample of securities for this initial analysis consists principally of non-financial corporations. The typical issuer had assets of $78.3 million, profits of $5.1 million, revenues of $117.5 million and 3,400 shareholders. Although these are OTC companies, they are obviously mature; not only in the sense that the market model fits, but that the risk associated with growth has been reduced. Many are stocks which in earlier periods were backed by venture capitalists. The average market value as of the various sale dates was $65.3 Million, about twelve times earnings.

The secondary market confronting sellers of restricted stock appears to have the depth necessary to absorb the average proposed sale of 5200 shares in this sample. The typical proposed sale had a market value on the proposed sale date of $43,500 which is in sharp contrast to the mean market value of $25,800 on the actual date of a Rule 144 transaction. On the actual sale date the average trading volume in the sample was 12,045 shares and the average bid price 12⅛. Even though the average number of shares outstanding was 4,830,000 for the securities analyzed, the average transaction was considerably smaller than the one percent permitted by law. Any sale of 1% is certainly large, approaching the size of a registered secondary distribution, and potentially disruptive. The mean trade of restricted stock of about 2,200 shares per day is also small when compared to the average weekly trading volume in the five days preceding the sale of 33,600 or the mean proposed sale of 5200 shares.

Although the actual transactions analyzed here are well within the legal guidelines, the key limitation is in fact the trading volume on the day of sale. This is where market disruption will take place. A proposed sale of 5200 is almost half of the mean trading volume on the actual sale date. Since the average ratio of trading volume accounted for by restrictive stock is 40%, it is reasonable to suppose that these sales may disrupt trading markets if buyers are aware that Rule 144 stock is being sold (by whom and in what issues, perhaps) as this would constitute negative information. It is this aspect of the volume limitation that is of concern in this study and is consistent with the prevailing view of capital market efficiency.

B. *Methodology*

To investigate shareholder returns associated with the sale of stock under Rule 144, abnormal security returns for the sample of issuers were estimated for a period of ±60 days surrounding the sale date, excluding a 7 day test period about the actual event day as reported by brokers. The estimates were generated using the well-known market model to control for the effects of market-wide information on security returns as first developed by Sharpe [12]. The returns generation process is assumed stationary, linear and univariate normal where the covariance of $\tilde{R}_{mt}$ and $\tilde{\epsilon}_{it}$ are equal to zero, $E(\tilde{\epsilon}_{it}) = 0$, and a constant variance in $\tilde{\epsilon}$ is assumed. The abnormal return for security i in day t can be calculated, given the estimates of the parameters α_i and β_i, as:

$$\tilde{\epsilon}_{it} = \tilde{R}_{it} - [\hat{\alpha}_i + \hat{\beta}_i \tilde{R}_{mt}],$$

where tildes (~) denote random variables and carats (^) denote estimates. $\tilde{R}_{it}$ is the return on security i in day t, $\tilde{R}_{mt}$ is the return on the market portfolio of all risky assets in day t and $\tilde{\epsilon}_{it}$ is the disturbance term assumed to capture events specific to security i on day t. The β coefficient was also estimated before and after the test period. This assessment gives us great confidence in the stability of β over time since no significant differences were observed.[7] We expect mean residuals to be negative and significantly different from zero if there is any market disruption on day "0" and the mean post sale period.

Log relatives of the representative bid prices as reported at the end of the trade day in the *All Securities Report* of NASDAQ (appropriately adjusted for dividends and stock splits) are used to calculate daily returns. The return on the market is approximated by the Over-the-Counter Industrial Average Index (OTCIA) and the Standard and Poor's (S&P) 500 stock price index. As is customary, day "0" is the actual sale date, and we form groups of securities experiencing the same event even though they each occurred on different calendar dates. The mean residual (MR) or abnormal return on any day t is given by

$$MR_t = \bar{\epsilon}_t = 1/N \sum_{i=1}^{N} \hat{\epsilon}_{it} \qquad t = -60 \ldots +60$$

where N is the number of securities in the final sample. A measure of dispersion, the standard deviation for day t, $S(\bar{\epsilon}_t)$, is calculated as

$$S(\bar{\epsilon}_t) = [1/(N-1) \sum_{i=1}^{N} (\hat{\epsilon}_{it} - \bar{\epsilon}_t)]^{1/2}$$

We calculate the cumulative mean residual, taking note of comments by Brown and Warner [1], but report following Scholes [10] an abnormal performance index:

$$API_D = \frac{1}{N} \sum_{i=1}^{N} \left[\prod_{t=d}^{D} (1 + \hat{\epsilon}_{it}) \right]$$

Both yield substantially similar conclusions.

In the absence of systematic positive or negative abnormal returns, $E(API_D) = 1.0$ although persistent non-zero returns should shift this index away from 1.0 indicating some effect in the test period surrounding the actual sale date.

IV. Empirical Results

Mean residuals, standard error of the mean, cumulative mean residuals, abnormal price indices, and the fraction of negative residuals on various days relative to the actual sale date of Rule 144 stock are shown in Table I. Figure 1 is a plot of the abnormal performance index for these stocks, and Figure 2 provides a cross-sectional plot of the median residual within a 50% confidence interval.

In the period after the actual sale of restricted stock in the OTC market, the mean prediction errors are very small. Although negative, a fact consistent with any market disruptive thesis, mean standard errors are relatively larger than the

[7] Our ordinary least squares estimates are robust when compared to the instrumental variables approach of Scholes and Williams [11] which we tried. We also tried several indices (value and equally weighted) as well with no significant differences in results.

Table I

Mean Residuals (MR), Standard Error of the Mean (SEM), Cumulative Mean Residuals (CMR), Abnormal Price Indices (API), and the Fraction of Negative Residuals (FN) on Various Days Relative to the Actual Sale Date of Restricted Stock

Day	MR	SEM	CMR	API	FN
−25	0.010810	0.007799	0.010810	1.007302	0.630435
−24	0.002748	0.003504	0.013558	1.010700	0.652174
−23	0.002142	0.003139	0.015700	1.013108	0.521739
−22	−0.005593	0.006279	0.010107	1.009652	0.543478
−21	0.002395	0.004652	0.012502	1.012836	0.586957
−20	0.002373	0.006260	0.014874	1.012062	0.586957
−19	−0.002935	0.002951	0.011940	1.008114	0.630435
−18	−0.004355	0.004093	0.007584	1.002810	0.608696
−17	−0.000834	0.003874	0.006751	1.001232	0.456522
−16	0.000607	0.003677	0.007358	1.000895	0.500000
−15	−0.000507	0.002715	0.006851	0.999897	0.543478
−14	0.004361	0.003212	0.011212	1.003554	0.478261
−13	0.000426	0.003086	0.011637	1.003525	0.565217
−12	0.000468	0.003075	0.012105	1.004364	0.500000
−11	−0.005748	0.007839	0.006357	1.000245	0.543478
−10	0.004520	0.007517	0.010877	1.001192	0.478261
−9	−0.003802	0.003861	0.007075	0.996968	0.565217
−8	0.006175	0.004939	0.013250	1.000692	0.478261
−7	0.003888	0.004793	0.017138	1.002860	0.500000
−6	−0.003617	0.002968	0.013521	0.998961	0.673913
−5	−0.001662	0.003528	0.011859	0.996509	0.565217
−4	0.001930	0.002748	0.013789	0.997839	0.521739
−3	0.003657	0.004831	0.017446	1.000361	0.478261
−2	−0.001578	0.004186	0.015867	0.998800	0.565217
−1	0.004982	0.005421	0.020849	1.002727	0.500000
0	−0.003741	0.005635	0.017108	0.999023	0.608696
1	0.000785	0.005396	0.017893	0.999766	0.521729
2	−0.004141	0.005965	0.013752	0.995772	0.652174
3	0.004819	0.004135	0.018571	1.001557	0.478261
4	−0.003356	0.005325	0.015215	0.996302	0.586957
5	−0.000477	0.005271	0.014737	0.996458	0.478261
6	−0.004762	0.004487	0.009975	0.991271	0.586957
7	−0.000303	0.003868	0.009672	0.990551	0.630435
8	−0.001075	0.003472	0.008597	0.989156	0.652174
9	−0.004334	0.003444	0.004263	0.985535	0.565217
10	−0.002266	0.004228	0.001997	0.983762	0.608696
11	−0.003642	0.004110	−0.001645	0.979306	0.521739
12	−0.003856	0.003177	−0.005501	0.975344	0.586957
13	−0.006561	0.005843	−0.012063	0.970930	0.543478
14	−0.003669	0.002683	−0.015731	0.966716	0.695652
15	−0.003413	0.004048	−0.019144	0.962831	0.586957
16	0.005551	0.003272	−0.013594	0.968194	0.500000
17	−0.008208	0.003519	−0.021802	0.961321	0.652174
18	−0.000977	0.003682	−0.022778	0.960464	0.630435
19	0.006682	0.003010	−0.016096	0.966347	0.369565
20	0.006216	0.002691	−0.009880	0.972128	0.456522
21	0.004142	0.003295	−0.005738	0.976635	0.478261
22	0.008001	0.005984	0.002263	0.983141	0.500000
23	−0.002993	0.004177	−0.000730	0.979139	0.500000
24	−0.000437	0.004854	−0.001167	0.978614	0.500000
25	−0.001159	0.006221	−0.002326	0.976947	0.608696

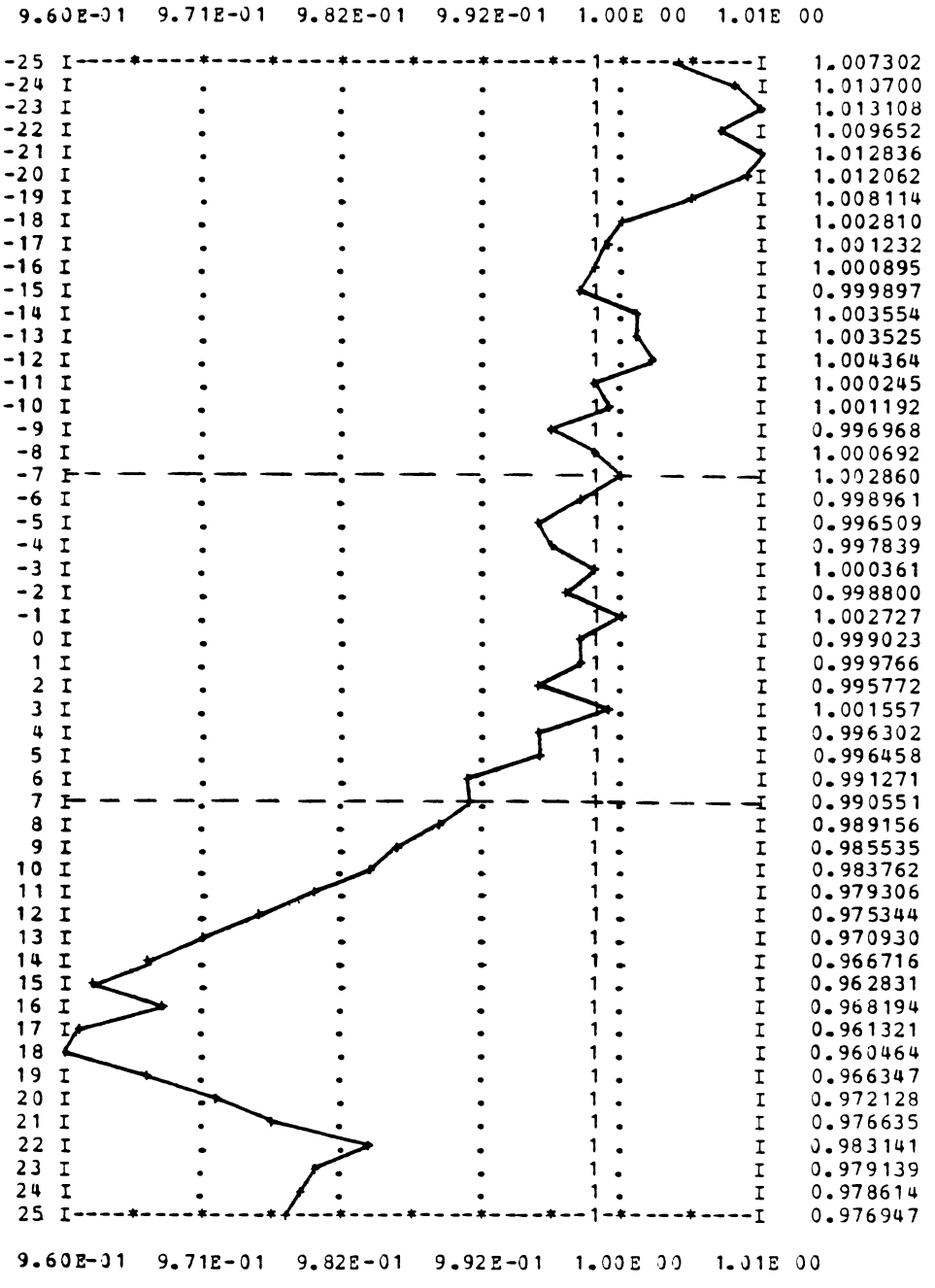

Figure 1. Plot of Abnormal Performance Index

mean and the t-statistic. The average residual on day = 0 is −0.0037 ($t = 0.8$) and not significant. Indeed, in the 7 days before and after the sale, mean residuals are negative only one-third of the time and insignificant. The median residuals of Figure 2 provide the same conclusion without reliance on the strong normality

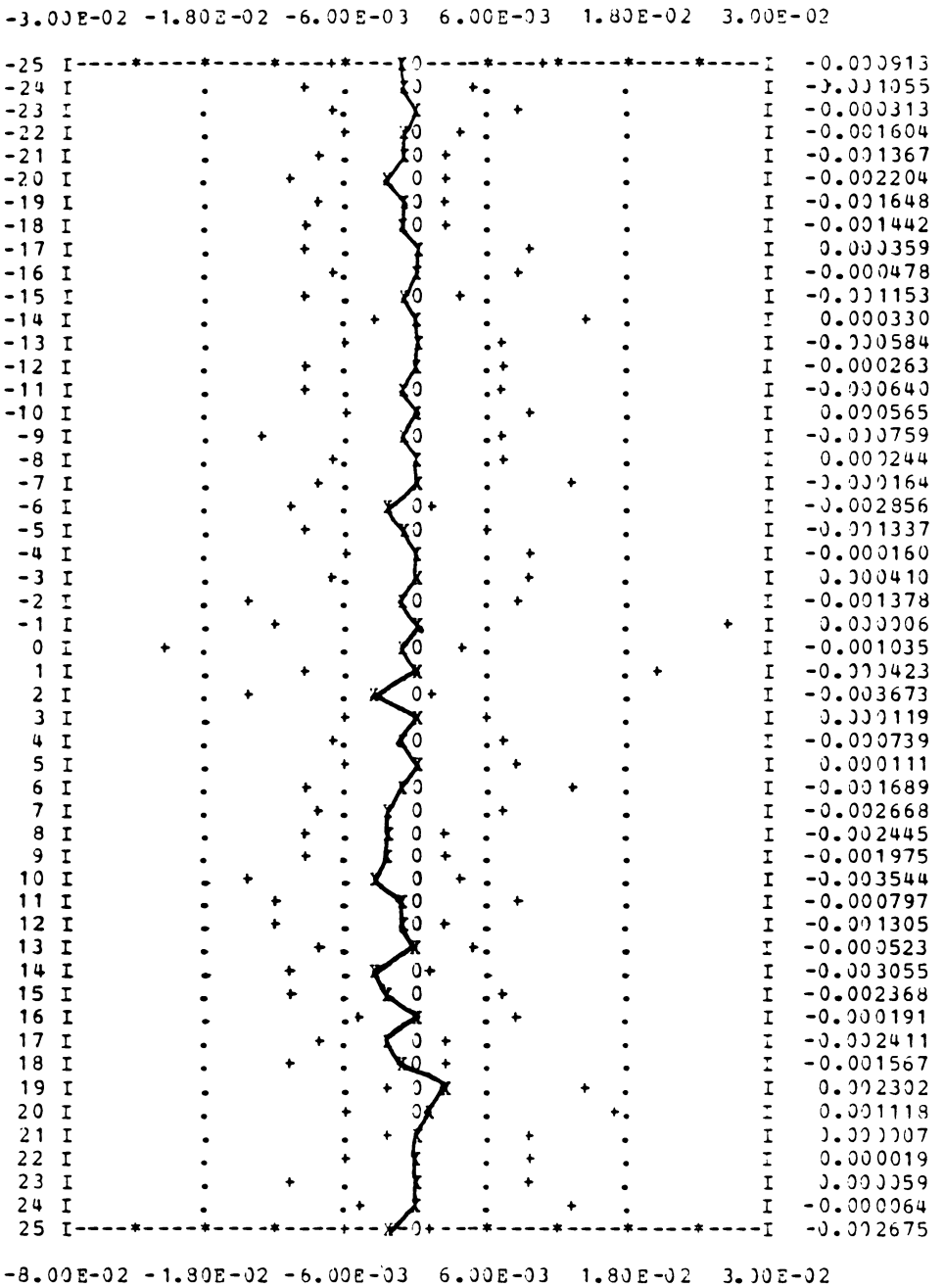

Figure 2. Cross-Sectional Plot of Median Residuals

assumptions of the model. Note the greater variability around the actual sale date as measured by the interfractile range.

The abnormal performance index is on a general decline in the seven days subsequent to day 0 falling 0.84%. During the 21 days beginning with day −10,

the index falls .22% [day −10 to day 0] then proceeds to fall (−1.52%) for a net decline of −1.3%. In the test period, there is hardly any observable abnormal return. From day −7 to day 0, the marginal return is −.0039, from day 0 to day −7, it is −.0084. The cumulative mean residual provides similar evidence, and there does not appear to be any general market disruption as a result of Rule 144 sales nor is there any information leakages.

A. *Market Disruption and the Size of Sale*

The original sample was also partitioned into several subsamples for further analysis according to the proportion of Rule 144 stock sold as a percentage of the trading volume on the date of sale. A low volume would characterize those stocks for which the percentage of Rule 144 stock sold was less than 25%, a medium volume sample in which the percentage of restricted stock sold was between 25%–60%, and a high volume for which the percentage of restricted stock sold was greater than 60%.

The mean error and the value of the performance index for each subsample on the actual sale date and for various relative days, are shown in Table II. Marginal returns between various holding periods are calculated and appear in the right-hand columns of the table.

This further evidence does not conclusively support any secondary market disruption or selling pressure thesis by relative size of the transaction. The only negative (and surprisingly significant) mean error is on the medium volume sample ($MR = -.0129$). Other residuals for the various days in the test period are largely insignificant except for day +6 in the high volume sample and day +2 in the low volume sample. The abnormal performance index of the 14 day test period falls only 1.23%, a price decline hardly sufficient to support any trading strategies net of transaction costs.[8]

These results do not support any market disruption thesis. For the category in which the Rule 144 stock was in excess of 60% of the trading volume for the day, although expected to show larger overall declines in the value of the performance index and larger residuals, it did neither. On day 0, the high volume mean residual was positive, and 25% of the average residual for all stocks in the sample. For any immediate post sale period the marginal abnormal returns are small and appear to be of no consequence. Moreover, we do not find any relationship between residuals on the actual sale date and the dollar value of the trade, the percentage of the actual Rule 144 sale to the volume in the five days previous, and the percentage of the daily trading volume accounted for by a Rule 144 transaction.

B. *Market Disruption and the Type of Seller*

Since neither large nor small Rule 144 sales in absolute or relative terms seem to have any strong or predicted effect on performance, we determined to examine various subgroups according to the type of seller. If for example we isolate sales by affiliates of the issuer or sales in high technology issuers, we may be able to

[8] Transaction cost are heavy and include legal opinions besides the Form 144 filing and the usual brokerage fees.

Table II

The Effect of Size of the Rule 144 Stock Sale as a Percentage of Trading Volume, the Type of Seller and the Timing of Sale and Amounts on Market Performance

Sub Sample	Mean Error at Day 0	Performance Index Value at Various Dates Relative to the Actual Sale Date of Restricted Stock							Marginal Abnormal Returns for Periods:			
		−10	−7	−1	0	+1	+7	+10	−10 to 0	−7 to 0	0 to + 7	0 to +10
All Transactions (46)#	−0.0370	1.0012	1.0029	1.0027	0.9990	0.9998	0.9906	0.9838	−.0022	−.0039	−.0084	−.0152
Size of Sale												
High Rule 144 Volume (12)	0.0009	1.0303	1.0309	1.0304	1.0299	1.0329	1.0280	1.0277	−.0004	−.0010	−.0019	−.0022
Medium Rule 144 Volume (17)	−0.0129*	0.9869	0.9869	0.9925	0.9797	0.9780	0.9744	0.9711	−.0072	−.0072	−.0053	−.0115
Low Rule 144 Volume (17)	0.0022	0.9962	1.0002	0.9946	0.9979	0.9996	0.9819	0.9672	+.0017	−.0023	−.0160	−.0307
Type of Seller												
High Technology (17)	−0.0008	0.9908	0.9922	1.0270	1.0261	1.0352	1.0251	1.0260	+.0339	+.0353	−.0010	−.0001
Affiliates (21)	−0.0076	0.9910	0.9982	1.0043	0.9966	0.9974	0.9880	0.9712	−.0016	+.0056	−.0086	−.0254
Private Placement (28)	−0.0068	1.0006	0.9977	1.0105	1.0032	1.0114	0.9899	0.9884	+.0055	+.0026	−.0133	−.0148
Non Affiliates (25)	−0.0005	1.0099	1.0068	1.0068	1.0011	1.0018	0.9927	0.9945	−.0057	−.0088	−.0084	−.0066
Non-High Technology (29)	−0.0055*	1.0069	1.0088	0.9893	0.9840	0.9801	0.9714	0.9603	−.0229	−.0248	+.0126	−.0237
Timing of Sale and Amounts												
Volume as Proposed (25)	−0.0019	0.9827	0.9936	0.9902	0.9887	0.9812	0.9799	0.9716	+.0060	+.0049	−.0088	−.0171
Date as Proposed (11)	0.0075	0.9906	1.0017	1.0071	1.0020	0.9886	0.9882	0.9870	+.0114	+.0003	−.0138	−.0150
Neither Volume nor Date (20)	−0.0036	1.0353	1.0212	1.0241	1.0196	1.0298	1.0061	1.0004	−.0157	−.0016	−.0135	−.0192

Notes: Test Period is −7 to +7. # Number in parenthesis is sample size, * Significant at .05 level.

isolate disruptive impacts on or about the actual sale dates which exceed those of the population as a whole. The results of this analysis are shown on Table II. The mean errors have the expected negative signs. In the case of affiliates of the issuer and sellers in non-high technology companies the *t*-statistic on day 0 was significant at the .05 level. The mean residuals in several days prior to the actual sale date were marginally significant at the .10 level for sellers in high technology companies. In the affiliates sub-sample days +2, +3, and +4 were significant at least at the .10 level. The type of seller or the type of company sold may convey information of some value to market participants.

In the presale period, it appears that a +3.53% increase from day −7 to 0 for sellers in high technology issuers is significant. Indeed, this is the largest, in absolute value, reported in this study. In the post sale period, it appears that sellers who acquired their stock in private placements over the −0 to +10 period could earn −1.48% on a value weighted portfolio of the sample while affiliates of the issuer could have earned −2.54% from day 0 to day +10. The largest postsale return (−1.33%) was to sellers who acquired their stock in private placements. These data do not seem to indicate the presence of any seriously disruptive sales of letter stock to the public. There is definitely some information leakage particularly in high technology sales which may have been resolved if we developed a larger sample and/or fully consider the actual costs incurred by sellers in this market.

C. *Market Disruption Relative to the Proposed Quantities and Sale Date*

Our final test considers the data stratified according to quantities of stock proposed and the proposed sale relative to the actual sale date. Some sellers actually proposed a sale and sold (in the amounts they proposed) on the same date in one transaction. Others could not sell when they proposed; and when they did, they did so in quantities well below their proposal. The data in Table II under timing of sales and amounts were developed to determine if the sales executed as proposed were different from those which were not as proposed. The mean residuals are insignificant, and there are no abnormal returns of consequence. Disruption attributable to differences between proposed and actual sales is rejected.

V. Conclusion

This study has shown that sales of restricted stock do not adversely impact OTC trading markets. In general, the market disruption thesis implicit in the volume limitation of Rule 144 is rejected. No systematic evidence was found to suggest that larger proportional amounts of restricted stock must be sold at greater price discounts. If anything there appears to be some leakage and possibly information effects for transactions by affiliates or sellers in high technology companies which can only be resolved with a larger (perhaps not randomly selected) sample.

This evidence would suggest that sellers of restricted securities do not put undue selling pressure on the market. Their self-interest would and does curb any obvious tendency to disrupt secondary trading markets.

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DISCUSSION

F. R. EDWARDS*: In reviewing a broad array of regulatory issues Professor Houthakker has presented us with a number of provocative conclusions and judgements. Rather than attempting to fit his analyses of these issues into any single conceptual framework that ties together the many diverse aspects of futures markets regulation,[1] he provides us with an analysis of each issue and his concluding views as to the wisdom of certain kinds of regulation. In some instances he concludes by suggesting a need for further research (the solvency of Clearing Houses), while in others he ends with concrete and specific recommendations (position limits).

As an early student of futures markets and an esteemed economist who has followed these markets closely for many years. Professor Houthakker's views deserve considerable attention. Overall, I am in agreement with many of his conclusions. My comments, therefore, stem more from what I believe are sins of omissions or overstatement. It is not so much that what he says is wrong, but what he fails to say that requires comment.

Professor Houthakker begins with a paradox which he fails to resolve to my satisfaction. He says: "With hundreds of traders actively participating in the determination of futures markets prices—the very epitome of perfect competi-

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[1] In a recent paper I attempted to provide such a framework. See "The Regulation of Futures Markets: A Conceptual Framework," *Journal of Futures Markets*, Winter, 1981.