

Competitive Commissions on the
New York Stock Exchange

by

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I. INTRODUCTION

In a recent study [4],¹ we examined in depth the effects of moving from fixed to competitive commissions upon NYSE member firms, investors, market efficiency, and the economy. That study found no persuasive reason to maintain the current fixed rates.

The purpose of this paper is to present some of the more important empirical analyses of our study with particular reference to those results which are based upon the income and expense statements of individual NYSE firms for each of the years 1965-1970. The Securities and Exchange Commission allowed us to use their computer² to perform various statistical analyses of these statements.³ This is the first time that any outside researchers have been given access to these files. The empirical results summarized in this current paper therefore should prove most interesting to students of financial markets.

To provide an initial perspective, the paper begins with an overview of the brokerage industry and a discussion of the more important economic arguments for and against competitive commissions. Following this, cost and profit functions for individual brokerage firms are developed using two different approaches. An analysis of the major ways in which competitive commissions might affect market efficiency is then presented, again with some new statistical results. A brief conclusion ends the paper.

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II. AN OVERVIEW

From 1961 on, the brokerage industry has expanded rapidly with only an occasional decline in activity. For instance, the market value of all shares sold on registered exchanges increased from \$64 billion in 1961 to \$196 billion in 1968 and then declined to \$131 billion in 1970 -- an increase of 106% over the entire decade [8]. The year 1971 saw a recovery nearly to the high of 1968. During the same 11 years, the relative importance of the New York Stock Exchange declined from 83% of the market value of all shares sold on registered exchanges to 80%.

The market value of the total of the purchases and sales attributable to odd-lots on the NYSE declined from \$11 billion in 1961 to \$7 billion in 1970 for a drop of 35%. To the extent that trading in odd-lots mirrors the direct activity of very small investors, their trading declined absolutely and became much less important relative to other investors. Further, there was a decline in the relative importance of non-institutional round-lot trading [8]. In view of the substantial decline in odd-lot trading, the relative decline in single round-lots was probably greater than in multiple round-lots.⁴ It should be noted that these declines have occurred under fixed and not competitive rates.

To provide a perspective on the financial condition of the brokerage industry, Table 1 presents the aggregate revenue and expense statements for all NYSE member firms doing business with the public.⁵ These revenue and expense statements differ slightly from the usual corporate statements in that there is no corresponding figure for net profits. The bottom line, the closest item to a figure for net profits, is net income before taxes and partners' or major stockholders' compensation.⁶ That most owners of brokerage firms, at least until the recent surge in public ownership, served also as managers make it difficult, if not impossible, to distinguish between the value of the partners'

Table 1

Aggregate Revenue and Expenses of New York Stock Exchange Members: 1961-1970

(\$ millions)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
<u>Revenue</u>										
Securities Commission Income	\$ 613	\$ 856	\$ 916	\$1,054	\$1,413	\$1,766	\$2,520	\$3,245	\$2,563	\$2,079
Profit or Loss from Principal Transactions in Securities in Trading Accounts	106	129	125	150	169	186	356	641	442	569
Profit or Loss from Management of and Participation in Underwriting Syndicates and Selling Groups	90	122	109	123	169	208	315	462	495	472
Income from Sale of Investment Company Securities	25	34	28	39	67	84	95	157	139	80
Interest Income on Customers' Accounts	114	191	232	263	264	337	346	445	472	376
Other Income	76	117	143	140	202	237	285	320	371	360
Total Revenue	1,025	1,449	1,553	1,769	2,284	2,818	3,917	5,270	4,483	3,936
<u>Expenses</u>										
Commissions Paid to Other Brokers	36	69	74	82	119	159	229	321	163	132
Other Brokerage, Clearance and Commission Fees	43	66	71	85	114	139	191	241	204	169
Registered Representatives' Compensation	206	256	263	296	405	507	711	945	799	619
Interest Expenses	76	138	181	212	223	265	266	392	443	403
Clerical and Administrative Employee Costs	226	360	342	387	475	586	781	1,095	1,161	972
Communication Costs	81	136	131	149	177	208	254	331	379	332
Occupancy and Equipment Costs	50	96	95	103	122	140	173	237	292	304
Promotional Costs	29	49	45	53	67	82	106	141	156	120
Losses in Error Account and Bad Debts	8	11	9	9	14	33	45	93	108	81
Other Expenses	39	63	62	69	87	103	157	250	228	211
Total Expenses	794	1,245	1,272	1,445	1,803	2,222	2,912	4,046	3,932	3,343
Income Before Partners' Compensation and Taxes	231	204	281	324	481	596	1,004	1,224	551	593
Number of Firms	337	346	312	310	374	371	374	386	379	331

SOURCE: SEC compilations based on NYSE Income & Expense Reports

Includes interim service charge effective 4-6-70. Revenue: \$186,800 - Expense: \$9,199

Does not include realized gain or loss from firm investments. Realized gain: 1969, \$81,592 - 1970, \$36,167

Includes gross receipts taxes.

The NYSE income and expense report was not mandatory until 1965.

NOTE: Figures have been rounded off. For 1970, two firms appear to be missing.

managerial services and the return attributable to their provision of capital. Further, a great majority of brokerage firms, at least until recently, were partnerships and therefore did not pay corporate taxes, so that it seems best for the sake of comparability to compare the income figures for partnerships with the income figures for corporations before taxes.

These aggregate statements reveal that the total revenues of NYSE members increased at the annual compound rate of 14.4% over the decade from 1961 through 1970, while net income before partners' compensation and taxes increased at the somewhat lower annual rate of 9.9%. These rates of growth are quite sensitive to the terminal date of 1970 -- a cyclical low for the brokerage industry. For instance, over the period from 1961 through 1968 -- a year of very good brokerage business, the net income figure grew at 23.2% and total revenue at 22.7%

Though it is often interesting to examine an industry in the aggregate, most of the remaining analyses will treat the individual firm as the basic unit of observation. For such analyses, firms will often be classified into subgroups of firms which can be viewed as homogeneous as to types of business.

This classification begins by designating a firm as a specialty firm if all of its employees work in New York City and below Chambers Street. The remaining firms are then divided into institutional, retail, and mixed firms using criteria very similar to those developed in the Institutional Investor Study [12]. Any firm whose security commission income per transaction on average exceeded \$100 was deemed a firm whose primary clients are institutions. All firms where this figure averaged less than \$50 were considered to have primarily retail customers. The remaining firms whose commission per transaction averaged between \$50 and \$100 were designated mixed firms.

In 1970, firms were for some analyses classified as institutional, mixed, or retail according to their security commission income per transaction in 1969. The

use of 1969 data to classify firms in 1970 abstracts from the overall increases in commissions per transaction caused only by the imposition of the surcharge in April 1970 and not by any basic changes in the business of a firm.⁷

Finally, each of these three groups of firms -- institutional, mixed, and retail -- were classified as national or regional. A national firm was defined as one with over 300 employees, five of whom were located in New York City, and with some employees outside of New York State. Otherwise, a firm was classified as regional. An examination of some of the basic data used in later analyses revealed not surprisingly that the total assets of any firm classified as national were larger than those of most firms classified as regional. Thus, regional and national designations can also be used as a rough dichotomization of firms by asset size.

Table 2 provides for these subgroups the aggregate values of the security commission income, total revenues, and the number of firms for 1965 through 1970. In view of the small number of institutional firms, Table 2 contains no breakdown of these types of firms into regional and nationwide, but only gives the total.

III. THE ECONOMIC ARGUMENTS

Economic arguments against moving from the current structure of fixed commission rates to competitively determined rates generally take one of the two following forms: First, the transitory disruptions of moving from fixed to competitive rates are so severe that they outweigh any potential permanent advantages of such a move. Second, even after the adjustment to competitive commissions, the characteristics of the brokerage industry would overall be inferior to the industry as it is now structured.

Table 2

Commission Income and Total Revenues
by Different Types of NYSE Firms

Type of Firm	1965	1966	1967	1968	1969	1970*
A. Securities Commission Income (millions of dollars)						
<u>Institutional</u>	21	64	138	375	386	332
<u>Mixed</u>						
Regional	74	116	150	230	203	148
Nationwide	66	203	274	416	302	260
Total	140	319	424	646	505	408
<u>Retail</u>						
Regional	318	331	360	299	261	214
Nationwide	932	1050	1595	1925	1408	1104
Total	1251	1381	1955	2224	1670	1318
<u>All</u>	1411	1763	2517	3245	2561	2058
B. Total Revenue (millions of dollars)						
<u>Institutional</u>	71	157	323	732	728	745
<u>Mixed</u>						
Regional	114	172	225	361	322	228
Nationwide	125	341	482	702	543	493
Total	240	513	707	1064	865	721
<u>Retail</u>						
Regional	502	504	538	503	458	374
Nationwide	1466	1637	2341	2972	2444	2059
Total	1968	2141	2879	3475	2902	2433
<u>All</u>	2279	2811	3908	5270	4496	3899
C. Number of Firms						
<u>Institutional</u>	8	15	23	38	44	41
<u>Mixed</u>						
Regional	45	54	59	80	78	65
Nationwide	7	16	17	23	23	21
Total	52	70	76	103	101	86
<u>Retail</u>						
Regional	205	185	157	122	125	106
Nationwide	105	98	117	123	108	91
Total	310	283	274	245	233	197
<u>All</u>	370	368	373	386	378	324

*The firms in 1970 were classified according to their 1969 average commissions per transaction. If they were instead classified by their 1970 data, the column for securities commission income would have been 360, 209, 495, 704, 163, 701, 864, 2075. The column for total revenue would have been 797, 343, 900, 1243, 272, 1358, 1630, 3938. The column for the number of firms would have been 46, 97, 35, 132, 75, 25, 100, 331.

Includes interim service charge effective 4-6-70.

The total revenue figures do not include realized gain or loss from firm investments.

NOTE: All figures have been rounded off.

The thrust of the first type of arguments is that reasonably acceptable institutional arrangements have evolved under the regime of fixed rates. To eliminate fixed rates would create temporary disruptions and perhaps permanent changes in the capital markets of such serious consequence that they would outweigh any long-run benefits of competitive rates . In addition, some socially desirable services which are now profitably provided might become unprofitable. The defensibility of this position hinges upon the kinds and magnitudes of these possible disruptions.

It is true that inefficient firms will be hurt. Some of these would be expected to leave the brokerage business. Others would be expected to improve efficiency or to merge with more efficient firms. The likely magnitude of these adjustments can best be assessed through an analysis of the cost structure of the industry.

Besides the fact that some firms will be hurt, it is sometimes asserted that certain types of firms will be hurt more than others. Most often it is alleged that regional firms will be less able to survive the rigors of competition than national firms. Assuming for the moment that regional firms would be hurt relative to national firms, it is asserted that the volume of underwriting of small regional issues and hence the supply of risk capital would be drastically reduced. Further, a reduction in the number of brokerage firms might reduce direct regional public participation in the equity markets, lead to a greater institutionalization of the market, and reduce the volume of trading on the NYSE -- all allegedly to the detriment of market efficiency.

Even if these possible transitional problems could be minimized, the NYSE [10] has taken the position that conditions in the brokerage industry are so different from those of the competitive model that such competitive models are inapplicable. More particularly, the Exchange has argued that "destructive" competition would

result from the abolition of fixed rates. The Exchange seems to be taking the position that the brokerage industry represents a natural monopoly -- an industry for which the average cost curve of a typical firm declines over the whole range of industry output.

If the brokerage industry were a natural monopoly, it could be argued that competitive pressures, in the absence of collusion, would ultimately result in an industry of only one firm. The encouragement of such a natural monopoly is often in the public interest providing there is appropriate regulation.⁸

There are however few natural monopolies, and it is doubtful that the brokerage industry is one of them. Natural monopolies usually have extremely high fixed costs relative to variable costs,⁹ but an examination of the expenses in Table 1 reveal no such high fixed costs. Commissions paid to other brokers; other brokerage, clearance, and commission fees; and registered representatives' compensation appear to vary directly with some portion of total revenue and thus are variable costs.

To examine the variability in the remaining items of expense, the percentage change in the level of an expense account from one year to the next can be compared to similar percentage changes in revenue. These percentage changes in expenses and total revenues, presented in Table 3, reveal that only occupancy and equipment expenses did not decline when revenue fell off from 1968 to 1969 and through 1970 -- the only significant decline in revenue during this entire period. With one exception, other expenses, the remaining types of expense in Table 3 continued to increase into 1969 even though revenues were declining. Finally, in 1970 all categories of expense except occupancy and equipment expenses fell as revenues continued to fall.¹⁰

It appears therefore that only occupancy and equipment expenses behave as one would expect fixed costs to behave.¹¹ In 1970, these expenses accounted for only 9.1% of all expenses.

Table 3
Percent Changes in Revenues and Expenses

	1961 to 1962	1962 to 1963	1963 to 1964	1964 to 1965	1965 to 1966	1966 to 1967	1967 to 1968	1968 to 1969	1969 to 1970
Securities Commission Income	39.6%	7.0%	15.1%	34.1%	25.0%	42.7%	28.8%	-21.0%	-18.9%
Total Revenue	41.5%	7.2%	13.9%	29.1%	23.4%	39.0%	34.5%	-15.0%	-12.2%
Commission Paid to other Brokers	91.7%	7.2%	10.8%	45.1%	33.6%	44.0%	40.2%	-49.2%	-19.0%
Clear Brokerage, Clearance and Commission Fees	53.5%	7.6%	19.7%	34.1%	21.9%	37.4%	26.2%	-15.4%	-17.2%
Registered Representatives' Compensation	24.3%	2.7%	12.5%	36.8%	25.2%	40.2%	32.9%	-15.5%	-22.5%
Interest Expenses	81.6%	31.2%	17.1%	5.2%	18.8%	4%	47.4%	13.0%	- 9.0%
Operational and Administrative Employee Costs	59.3%	- 5.0%	13.2%	22.7%	23.4%	33.3%	40.2%	6.0%	-16.3%
Communication Cost	67.9%	- 3.7%	13.7%	18.8%	17.5%	22.1%	30.3%	14.5%	-12.4%
Occupancy and Equipment Costs	92.0%	- 1.1%	8.4%	18.4%	14.8%	23.6%	37.0%	23.2%	4.1%
Operational Costs	69.0%	- 8.2%	17.8%	26.4%	22.4%	29.3%	33.0%	10.6%	-23.1%
Losses in Error Account and Bad Debts	37.5%	-18.2%	0.0%	55.6%	135.7%	36.4%	106.7%	16.1%	-25.0%
Repair Expenses	61.5%	- 1.6%	11.3%	26.1%	18.4%	52.4%	59.2%	- 8.8%	- 7.5%
Total Expenses	56.7%	2.3%	13.5%	24.8%	23.2%	31.2%	38.9%	- 2.8%	-15.0%
Income Before Partners' Compensation and Taxes	-11.3%	37.7%	15.3%	48.5%	23.7%	68.9%	21.8%	-55.0%	7.8%

Although the brokerage industry may not be a natural monopoly, the abolition of fixed rates might nonetheless cause a substantial increase in concentration and a corresponding reduction in the number of firms. Parenthetically, such an increase in concentration may be socially desirable if such an increase results in lower brokerage costs and if the consumer benefits from these lower costs. The number of firms and the degree of competitiveness within an industry hinge to a great extent upon the level of output at which an individual firm ceases to have economies of scale. If this level were small relative to the total output of the industry, one would expect a large number of competitive firms.¹² If this level were large, one would expect that a few firms would dominate the industry. The next two sections attempt to determine the likely structure of the brokerage industry under competitively determined commission rates.

IV. COST AND PROFIT FUNCTIONS -- THE INDIRECT APPROACH

There are two basic ways to assess the likely structure of the brokerage industry if competitive rates replace fixed rates. The first, an indirect method, attempts to infer what will happen to the industry from changes in the historical structure of the industry over time. More particularly, this technique examines concentration ratios over time and is sometimes called the survivorship approach. The second estimates cost and profit functions directly from accounting data and then uses these estimated functions to assess the future structure. In addition, cost and profit functions can sometimes indicate the relative profitability of different lines of business. This

section analyzes concentration ratios and the next provides direct estimates of such functions for brokerage firms.

Table 4 contains concentration ratios for firms which are members of the New York Stock Exchange and which do some public business.¹³ Concentration ratios are given for various groups of firms using both total revenue and security commission income as measures of size.

The concentration ratios for all member firms indicate that there was little change in concentration using either measure of size from 1965 through 1970. Measuring concentration by total revenue, the largest firm, Merrill Lynch, increased its share from 11% to 12%, while the next seven firms increased their share by two percent. The remaining 24 firms among the top 32 showed little change in concentration. Within this period, the concentration ratios tend to decrease through 1968 and then increase through 1970,¹⁴ at least as measured by the top eight firms.

This drop in concentration through 1968 -- a year of record business -- and the subsequent increase through 1970 may in great part stem from cyclical factors. Through 1968, many marginal small firms may have expanded beyond their optimal scale of operations, producing a decrease in concentration. In the poor business conditions of 1969 and 1970, a number of small firms and some large firms may have cut down their promotional activities, failed, or merged into other generally larger firms causing an increase in concentration among top firms. There is some indication [9] that this increase in concentration among the top firms may have continued through the second and third quarters of 1971 in that block trades of over \$500,000 showed a small increase in concentration among the large and small firms and a decrease for firms of moderate size.

Table 4

Measures of Concentration of NYSE Member Firms

of Firm	Number of Top Firms	Security Commission Income					Total Revenue						
		1965	1966	1967	1968	1969	1970	1965	1966	1967	1968	1969	1970
Firms	1	11	11	10	8	8	9	11	11	10	8	9	12
	8	29	29	28	24	24	27	29	29	27	25	26	32
	14	39	39	38	34	34	37	40	40	38	35	37	44
	20	47	47	45	41	41	44	47	47	45	43	45	51
	26	52	51	50	47	47	51	52	52	51	49	51	57
	32	56	55	55	52	52	56	57	57	55	54	55	61
tutional	7				55	54	58				83	82	n.a.
	14				79	79	80				96	n.a.	97
	21				91	90	91						
& Retail	1	12	12	11	10	10	12	13	13	12	11	12	16
	7	30	30	30	28	29	32	30	31	30	29	30	37
	13	43	43	43	41	41	45	43	44	43	42	44	50
	20	52	52	52	51	51	55	52	53	52	52	53	59
	7	48	38	40	34	34	38	54	38	41	37	36	40
	13	66	58	57	50	48	54	70	60	61	53	49	56
	20	79	72	71	62	59	65	81	74	73	63	60	68
	1	14	15	14	13	13	16	14	16	15	15	16	21
	8	37	41	40	41	41	47	37	43	41	43	44	52
	14	50	56	55	57	57	62	51	57	56	58	59	66
	20	58	63	63	66	66	70	59	n.a.	63	66	67	73

(Percent of business accounted for by top firms)

(Percent of business accounted for by top firms)

Merrill Lynch acquired Goodbody & Co. on December 11, 1970. This would have only a small effect on the concentration ratios in 1970.

However, recently released concentration figures[9] for the fourth quarter of 1971 and the first two months of 1972 -- a period of better business -- indicate a more even distribution of large blocks which confirms the cyclical nature of these concentration ratios.

Over the longest period covered from 1965 through 1970, there is a limited increase in concentration if revenue is measured by total revenue and very little change if measured by security commission income. In view of these mixed results according to the measure of size used and the stage of the cycle, one would probably conclude that if there were any increase in concentration, the increase was not large.

In addition to the concentration ratios for all firms, Table 4 contains concentration ratios for institutional firms and for mixed and retail firms, together and separately. Firms were classified by type in 1970 according to their 1969 average commissions per transaction to control for the surcharge.¹⁵ The data on institutional firms indicate that in terms of security commission income, there has been virtually no change in concentration from 1968 to 1969 and a modest increase in 1970. The combined group of mixed and retail firms showed very little change in concentration through 1968. From 1968 through 1970, this combined group showed a pronounced increase in concentration, part of which is probably due to cyclical fluctuations. Over the entire period from 1965 through 1970, this group exhibited a slight increase in concentration which is more pronounced in terms of total revenue than in terms of security commission income alone.¹⁶

From 1965 through 1969, mixed firms experienced a substantial drop in *concentration*, while retail firms exhibited a large increase in concentration.¹⁷ This phenomenon stems primarily from the reclassification of firms from retail to mixed as their average commissions per transaction increased. This increase in average commissions may have occurred because either firms consciously tried to increase

the number of large orders in their commission business or they experienced a relative decline of odd-lot and small round-lot orders. This relative decline in small orders may have been more pronounced for smaller than for larger retail firms.

To summarize, there has been only a modest increase, if any at all, in the concentration of all member firms. Such an increase, it should be noted, occurred under fixed rates. To the extent that price is more effective than non-price competition, competitive rates might only have acted as a catalyst to bring about the increase more quickly. The analysis of different types of firms gives a weak suggestion that there might be some but not an alarming increase in concentration of retail firms upon the introduction of competitive rates. There would probably be little effect on institutional firms where limited forms of negotiated commissions are already in play and where non-price competition might be expected to be more effective.

V. COST AND PROFIT FUNCTIONS -- THE DIRECT APPROACH

Interpretations of cost and profit functions estimated from accounting data generally make the assumption that each firm is producing in the most efficient way for its scale of operations. Then one can infer the optimal size firm by noting the scale of operations which minimizes cost per unit of output or maximizes profit per unit of output. If there are relatively inefficient firms operating near the true optimal scale, the inference of optimal size from estimated cost or profit functions may be wide of the mark.

Minimum commission rates, which are probably in excess of competitive rates except for possibly the smallest orders,¹⁸ provide an umbrella over inefficiently operated firms. If it can be assumed that there are proportionally as many large

inefficiently operated firms as moderate and small inefficiently operated firms, an econometrically estimated cost or profit function can be interpreted as some average of the cost or profit functions of both inefficient and efficient firms. The econometric cost function will therefore indicate higher costs than if it were estimated only for efficient firms. Nonetheless, if the cost (profit) per unit curve has only been shifted upwards (downwards) by the same amount at each level of output, the shape of the function will be preserved allowing a determination of the optimal size firm and the relative costs (profitability) of different lines of business.

Non-price competition in the brokerage industry poses a final difficulty in interpreting estimated cost and profit functions. Such non-price competition would inflate costs, so that the cost figures might be higher than they would be in competition. Yet if non-price competition is unrelated to the size of a firm, inferences about the optimal size firm might still be made. Again, similar remarks apply to profit functions.

In a competitive one-product industry, profits and costs per unit of output are merely mirror images of each other; it would make little difference, except possibly for econometric reasons, which measure was used. However, it does make a difference in a non-competitive multi-product industry. First, the unit of output in a multi-product firm is really undefined and only a crude index could be developed. Second, in an industry not at competitive equilibrium, the level of profits could differ for the same level of costs if the product mix differed. A measure which avoids the problem of defining a single number for output and takes into account the product mix is the total profits per dollar of assets, designated as TP/A . This ratio can be interpreted as the profit attributable to each dollar of assets in the firm. The optimal size firm would be the one with the level of assets which maximized this ratio.

Total profit was measured in three ways. The first measure TP_1 is net income before partners' compensation and taxes. This number corresponds to the income figures in Table 2. The second measure TP_2 is net income after imputed partners' compensation but before taxes. Imputed partners' compensation is calculated according to a formula in the income and expense statements of the New York Stock Exchange and is supposed to measure the compensation which would be attributable to partners for their managerial and sales functions. The third measure TP_3 is net income after partners' drawings or stockholders' salaries but before taxes. Table 5 gives the means of these measures of profit per dollar of assets for 1968 and 1970 by various groups of firms.¹⁹ It is interesting to note that these averages are all positive even in the bad year of 1970. The imputed compensation appears to be larger than actual drawings and salaries in 1970.

To examine the profits per dollar of assets, the following regression was run:

$$(1) \quad \frac{TP}{A} = a \frac{1}{A} + b + cA + dD$$

where A is measured in millions of dollars and D is a dummy variable assuming the value of 1.0 if underwriting profit exceeded five percent of the total revenue. Otherwise, D was equal to zero.

To interpret this equation, note that if a , c , and d are equal to zero, all firms would be expected to have the same level of total profits per dollar of assets, b , independent of the size of the firm or the amount of underwriting. If a is positive, an increase in assets will decrease TP/A ; if a is negative, an increase in assets will increase TP/A . If c is positive, the firm will eventually exhibit increasing values of TP/A with increases in A regardless of the sign of a ; if c is negative, TP/A will eventually decrease as A increases. If a and c are both negative, TP/A will first increase and then decrease. If the value of A which maximized TP/A exceeded the total assets of the

Table 5

Average Profits per Dollar of Assets for
Various Groups of Firms

<u>Type of Firm</u>	<u>TP₁/A</u>	<u>TP₂/A</u>	<u>TP₃/A</u>
A. <u>1970</u>			
Institutional	.0651	.0305	.0445
Mixed	.0552	.0143	.0383
Retail-Regional	.0480	.0070	.0341
Retail-Nationwide	.0303	.0111	.0246
Retail	.0436	.0080	.0317
Mixed & Retail	.0502	.0116	.0356
B. <u>1968</u>			
Institutional	.1572	.1192	
Mixed	.1113	.0657	
Retail-Regional	.1044	.0571	
Retail-Nationwide	.0577	.0401	
Retail	.0896	.0517	
Mixed & Retail	.0975	.0573	

the industry, one would conclude that there were increasing economies to scale over the whole range of output -- a natural monopoly. If a and c are both positive, the inference is that small and large firms are more profitable than moderate size firms, which would be an unexpected situation. Finally, the coefficient on the dummy variable D is a measure of the relative profitability of underwriting. A positive value indicates that firms with more underwriting revenue have a larger value of TP/A than those with less; a negative value, the opposite.

The above regression was run using TP_1 and TP_2 as measures of profit on institutional, mixed and retail firms.²⁰ Both mixed and retail were further subdivided into regional and nationwide. These four groups were finally subclassified into those firms with security commission income accounting for more than 70 percent of total revenue and those with 70 or less percent. These regressions are presented in Table 6 for the years 1968 and 1970.

For every group in both 1968 and 1970 using either measure of profit, the coefficients on the underwriting dummy variables were insignificantly different from zero. This does not mean that underwriting was unprofitable but only that underwriting was not more or less profitable than other lines of business.

In 1970, institutional firms showed no economies or diseconomies of scale in that the coefficients a and c were insignificantly different from zero using either measure of profit. The same conclusion applies to mixed regional firms in which the proportion of security commission income to total revenue was no greater than 70%, and to mixed national firms in which this proportion exceeded 70%. For the other groups of mixed firms as well as the other group of retail regional firms, one of the two measures of profit suggests constant returns to scale while the other has a significant value of the coefficient a . That one obtains two different conclusions depending upon the profit measure used suggests that the result is not robust and that any economies or diseconomies of scale which may exist are small.

Table 6
Total Profits as a Function of Assets for NYSE Member Firms

Type	1962		1970		R ²	db	ca	+	b	+	1/A	+	1/A	+	b	+	ca	+	db	R ²
	Dependent Variable	TP 1/A	TP 2/A	TP 1/A																
Institutional	TP 1/A	376,800 (1.77)	0.13179 (3.50)	-0.0154 x 10 ⁻⁸ (-1.78)	0.02910 (0.73)	0.12					137,320 (1.95)	0.05411 (3.06)					-0.0016 x 10 ⁻⁸ (-0.30)	-0.50813 (-0.33)	0.04	
	TP 2/A	278,100 (1.52)	0.08360 (2.87)	-0.0130 x 10 ⁻⁸ (-1.82)	0.05540 (1.49)	0.08					30,950 (0.45)	0.03192 (1.85)					0.0019 x 10 ⁻⁸ (0.35)	-0.01672 (-0.59)	0.00	
Mixed Regional x ≤ 0.7	TP 1/A	-266,320 (-1.65)	0.21045 (4.88)	-0.3105 x 10 ⁻⁸ (-2.33)	0.01050 (-0.38)	0.05					135,970 (1.84)	0.04305 (1.53)					-0.1174 x 10 ⁻⁸ (-1.63)	0.02165 (1.25)	0.30	
	TP 2/A	-188,280 (-1.41)	0.13294 (3.74)	-0.1502 x 10 ⁻⁸ (-1.36)	-0.01170 (-0.38)	0.00					152,900 (0.85)	0.01382 (0.73)					-0.0484 x 10 ⁻⁸ (-0.88)	0.00312 (0.65)	0.05	
Mixed Regional x > 0.7	TP 1/A	97,650 (1.57)	0.09139 (3.58)	-0.0670 x 10 ⁻⁸ (-1.06)	0.00490 (0.24)	0.18					88,090 (1.89)	0.04758 (1.58)					-0.0710 x 10 ⁻⁸ (-0.70)	-0.01153 (-0.52)	0.09	
	TP 2/A	-45,530 (-1.22)	0.06535 (4.12)	-0.0543 x 10 ⁻⁸ (-1.11)	-0.00221 (-0.18)	0.00					-242,800 (-4.96)	0.07103 (3.18)					-0.1949 x 10 ⁻⁸ (-2.06)	-0.01040 (-0.50)	0.36	
Mixed Nationwide x ≤ 0.7	TP 1/A	826,600 (0.81)	0.06854 (1.92)	-0.0061 x 10 ⁻⁸ (-0.58)	-0.00216 (-0.14)	0.07					175,350 (2.95)	-0.01270 (-0.43)					0.0030 x 10 ⁻⁸ (0.33)	0.02279 (0.93)	0.30	
	TP 2/A	861,800 (0.68)	0.03366 (1.15)	-0.0011 x 10 ⁻⁸ (0.11)	0.00063 (0.04)	0.00					88,310 (1.77)	-0.00251 (-0.30)					0.0068 x 10 ⁻⁸ (0.10)	0.01762 (0.66)	0.11	
Mixed Nationwide x > 0.7	TP 1/A	-2,309,400 (-0.52)	0.15278 (1.15)	-0.0398 x 10 ⁻⁸ (-0.59)	0.02765 (0.51)	0.00					-15,122,000 (-1.23)	0.63148 (1.31)					-0.5089 x 10 ⁻⁸ (-1.18)	0.00617 (0.25)	0.00	
	TP 2/A	-4,048,200 (-1.37)	0.13666 (1.52)	-0.0330 x 10 ⁻⁸ (-0.73)	0.05265 (1.47)	0.07					-10,123,500 (0.88)	0.42036 (0.93)					-0.3475 x 10 ⁻⁸ (-0.87)	0.01015 (0.33)	0.00	
Retail Regional x ≤ 0.7	TP 1/A	84,790 (1.63)	0.08601 (3.27)	-0.0820 x 10 ⁻⁸ (-1.30)	0.03103 (1.82)	0.14					50,320 (1.44)	0.04097 (2.32)					0.0478 x 10 ⁻⁸ (-0.74)	0.01186 (1.06)	0.08	
	TP 2/A	-20 (-0.00)	0.05270 (3.02)	-0.0392 x 10 ⁻⁸ (-0.94)	0.02277 (1.89)	0.06					-54,360 (1.78)	0.01108 (0.72)					0.0157 x 10 ⁻⁸ (0.28)	0.00492 (0.43)	0.06	
Retail Regional x > 0.7	TP 1/A	171,320 (4.84)	0.04576 (2.07)	0.0040 x 10 ⁻⁸ (0.03)	0.03335 (1.58)	0.47					122,820 (2.42)	-0.00272 (-0.09)					0.0665 x 10 ⁻⁸ (0.49)	0.05508 (1.46)	0.29	
	TP 2/A	63,180 (2.33)	0.01402 (0.86)	0.0845 x 10 ⁻⁸ (0.92)	0.02723 (1.76)	0.11					63,620 (1.67)	-0.03370 (-1.49)					0.1459 x 10 ⁻⁸ (1.42)	0.03676 (1.30)	0.07	
Retail Nationwide x ≤ 0.7	TP 1/A	1,408,200 (3.17)	0.02418 (1.53)	0.0018 x 10 ⁻⁸ (1.21)	0.00873 (0.78)	0.21					1,853,600 (4.32)	-0.00227 (-1.35)					0.0020 x 10 ⁻⁸ (0.94)	0.02057 (1.17)	0.48	
	TP 2/A	745,400 (1.87)	0.02283 (1.82)	0.0018 x 10 ⁻⁸ (1.25)	0.00253 (0.23)	0.00					1,849,500 (3.74)	-0.02748 (-1.95)					0.0024 x 10 ⁻⁸ (1.37)	0.01142 (0.77)	0.37	
Retail Nationwide x > 0.7	TP 1/A	989,700 (17.06)	0.00274 (0.26)	0.0269 x 10 ⁻⁸ (2.16)	0.00575 (0.54)	0.94														
	TP 2/A	726,600 (12.61)	-0.00618 (-0.60)	0.0279 x 10 ⁻⁸ (2.25)	0.00108 (0.10)	0.88														

(x = Security Commission Revenue/Total)
Notes: The figures in parentheses are t-values; the coefficients of determination, R², have been adjusted for degrees of freedom. Because of too few observations, regressions for retail nationwide x > 0.7 were not calculated.

The retail nationwide regression has a significant coefficient on the term $\frac{1}{A}$ regardless of the measure of profit used. If one takes the regression at face value, it implies that total profits per dollar of assets decrease until assets reach about \$310 million and then increase again -- a peculiar result. It was thought that Merrill Lynch, which is the largest brokerage firm and highly profitable, might have caused the profit curve to bend up. Running regressions with and without Merrill Lynch indicated that this explanation was not correct. A possible explanation which is consistent with the values of the concentration ratios presented previously is that the larger and moderate size nationwide retail firms resort to more non-price competition than the smaller nationwide retail firms and that there are some economies of scale in the nationwide retail business. This set of circumstances would explain the odd result that profits per dollar of assets tend first to decline and then increase as assets rise.

If this explanation is correct, the introduction of competitive rates might force the smaller nationwide retail firms into active price competition. Such price competition would lead to a reduction in their profit margins and probably to some increases in concentration.

The results for 1968 are similar. Generally, there appear to be no economies or diseconomies of scale for the same groups for which this was true in 1970. The most noticeable exception is the retail regional groups for which security commission income accounts for more than 70% of total revenue. This exception takes the form observed for retail nationwide firms in 1970.

Regression (1) is a simple function which allows an examination of economies of scale in a straightforward fashion, but its simplicity precludes a detailed examination of the relative profitability of different types of businesses. A more complicated profit function is:

$$(2) \quad TP = a + b(N \cdot V) + cN(V)^2 + dN \ln\left(\frac{V}{N}\right) + e \text{ OR} + f(\text{OR})^2 + g \text{ UP} + h(\text{UP})^2 + i(D \cdot \text{UP})$$

where V is security commission income in dollars; N , the number of transactions; UP , underwriting profit in dollars; OR , all other revenues in dollars; and D , a dummy variable defined as one for a regional and zero for a nationwide firm. This regression allows for economies of scale in each line of business through the squared terms.²¹ The variable $(D \cdot \text{UP})$ allows a comparison of the relative profitability of underwriting for regional versus nationwide firms.

The first three variables $N \cdot V$, NV^2 , and $N \cdot \ln\left(\frac{V}{N}\right)$, are associated with commission income. These variables were derived by assuming that each security transaction had an associated profit up to a constant of:

$$(3) \quad bV + cV^2 + \ln\left(\frac{V}{N}\right).$$

The first two terms allow for economies of scale in the firm for its level of commission income. The last term allows profit to increase in a non-linear fashion with the average size of a transaction. Expression (3) was aggregated over the number of transactions N to give equation (2). Finally, equation (2) was divided by assets A and estimated as:

$$(4) \quad \frac{TP_1}{A} = a \frac{1}{A} + b \left(\frac{NV}{A}\right) + c \left(\frac{NV^2}{A}\right) + d \left(\frac{N \cdot \ln\left(\frac{V}{N}\right)}{A}\right) + e \left(\frac{\text{OR}}{A}\right) + f \left(\frac{\text{OR}^2}{A}\right) + g \left(\frac{\text{UP}}{A}\right) + h \left(\frac{\text{UP}^2}{A}\right) + i \left(\frac{D \cdot \text{UP}}{A}\right)$$

The coefficients for regression (4) are presented in Table 7 for 1968 and 1970 for institutional, mixed, all retail, retail regional, and retail nationwide firms. These regressions yield several conclusions: First, the coefficients of $D \cdot \text{UP}/A$ are all insignificant which indicate that neither regional nor nationwide firms finds underwriting relatively more profitable. This conclusion supplements the previous one on underwriting. The insignificant coefficients on the dummy variable in the previous simple regressions indicate that the profitability of a narrowly defined group of firms tends to be unaffected by the proportion of its revenue which it derives from underwriting. This more complex regression

Table 7

Total Profits as a Function of Types of Business for NYSE Member Firms

Dependent Variable	$a \frac{1}{A}$	$+ b \frac{NV}{A}$	$+ c \frac{N \cdot V^2}{A}$	$+ d \frac{\ln(V/N)}{A}$	$+ e \frac{OR}{A}$	$+ f \frac{OR^2}{A}$	$+ g \frac{UP}{A}$	$+ h \frac{UP^2}{A}$	$+ i \frac{D \cdot UP}{A}$	R^2
TP ₁ A	475,200 (2.75)	0.2793×10^{-5} (0.77)	-0.0459×10^{-12} (-0.48)	4,1220 (0.72)	.5440 (3.09)	-0.034×10^{-7} (-0.35)	.8110 (2.24)	-0.056×10^{-6} (-0.55)	.046 (0.06)	0.43
TP ₁ A	81,110 (2.22)	-0.0462×10^{-5} (-0.83)	0.0114×10^{-12} (0.70)	3,3446 (3.86)	.4791 (6.26)	-0.052×10^{-7} (-0.48)	.4830 (3.10)	-0.003×10^{-6} (-0.07)	-.101 (-0.26)	0.53
TP ₁ A	90,950 (5.42)	-0.0076×10^{-5} (-1.15)	0.0005×10^{-12} (1.27)	1,4992 (6.52)	.3502 (7.77)	-0.037×10^{-7} (-0.41)	.4266 (3.86)	-0.031×10^{-6} (0.61)	-.281 (-1.57)	0.75
TP ₁ A	78,510 (3.01)	-0.0365×10^{-5} (-0.49)	0.0280×10^{-12} (-0.33)	2,0114 (3.54)	.3101 (4.49)	0.222×10^{-7} (1.00)	.3320 (1.99)	0.069×10^{-6} (0.66)		0.63
TP ₁ A	468,800 (2.19)	0.0087×10^{-5} (1.45)	0.0004×10^{-12} (1.34)	.3188 (0.62)	.3273 (3.85)	-0.113×10^{-7} (-1.58)	.4278 (1.97)	-0.016×10^{-6} (-0.38)		0.92
TP ₁ A	-32,970 (-0.49)	-0.0175×10^{-5} (-0.62)	0.0456×10^{-12} (0.46)	10,5920 (3.67)	.3393 (1.99)	-0.009×10^{-7} (-0.25)	-.2099 (-0.54)	0.041×10^{-6} (0.58)	-.356 (-0.43)	0.54
TP ₁ A	142,270 (2.50)	0.0561×10^{-5} (1.11)	0.0054×10^{-12} (-0.62)	-1,0970 (-1.19)	.3409 (3.05)	-0.267×10^{-7} (-1.24)	.3684 (3.00)	0.020×10^{-6} (0.57)	.121 (0.58)	0.21
TP ₁ A	45,590 (2.22)	-0.0263×10^{-5} (-1.97)	0.0041×10^{-12} (1.66)	.7468 (1.59)	.2575 (3.57)	-0.120×10^{-7} (-1.12)	.2274 (1.43)	0.037×10^{-6} (0.46)	-.157 (0.83)	0.41
TP ₁ A	25,520 (0.71)	-0.2012×10^{-5} (-0.92)	0.2180×10^{-12} (0.80)	1,8690 (1.40)	.2202 (2.06)	-0.114×10^{-7} (-0.27)	.0432 (0.21)	0.159×10^{-6} (1.37)		0.36
TP ₁ A	480,100 (0.46)	-0.0115×10^{-5} (-0.49)	0.0067×10^{-12} (2.08)	-3,1310 (-1.50)	.8668 (2.63)	-0.225×10^{-7} (-1.66)	.5138 (0.97)	0.060×10^{-6} (-0.51)		0.57

Figures in parentheses are t-values, the coefficients of determination, R^2 , have been adjusted for degrees of freedom.

pits nationwide firms against regional firms and indicates that underwriting revenues generate the same profit potential as any other line of business.

Second, total profits per dollar of assets tend to increase as the average commissions and hence the average size per transaction increase holding assets constant. In 1968, the relationship is significant for mixed and retail firms but not for institutional firms. This pattern of significance is surprising because the average commissions of retail and mixed firms were limited by the classification scheme to a range of 50 dollars, whereas the institutional firms presumably had a much larger range of variability in this average.

In 1970, one obtains the expected result that total profit per dollar of assets is positively and significantly related to average commissions per transaction for institutional firms. Two of the remaining four groups have negative signs but they are insignificant.

To use this more complex regression to investigate further the existence or non-existence of economies of scale would require an estimated production function. Such a function could be used in a constrained optimization problem to maximize total profits per dollar of assets. The study did not have time to develop such a production function.

These regressions in summary give strong support to the conclusion that underwriting is no more or less profitable than other lines of business. This section also confirmed the general conclusions reached from the analysis of the concentration ratios: namely, there may be some weak economies of scale for the larger retail nationwide firms. Competitive commission rates might cause some increase in concentration among these firms, but it would probably not be great. In comparison with other industries, a small increase in concentration would still leave the brokerage industry as one of the more competitive. Other than retail nationwide, there is no significant evidence of economies of scale.

VI. MARKET EFFICIENCY

Since the NYSE [10] has taken the position that competitive commissions would decrease volume on that Exchange, this section first explores the consequences of any such loss on the operational and allocational efficiency of the stock market. We shall consider initially the impact of volume on operational efficiency measured by transaction costs. These costs include both commissions and bid-ask spreads.

The NYSE fixed rate schedule precludes the use of historical time-series to provide a direct estimate of the relationship between commission rates and volume on that Exchange. Yet some indirect evidence on this relationship is available from the over-the-counter markets where rates are not fixed. A study of 200 issues [15] traded in those markets on January 18, 1962 pointed to a statistically significant though not overwhelming negative relationship between commission rates and trading activity. (It also found a negative relationship between the rates charged and number of dealers quoting prices.)

Even so, a shift from fixed minimum to competitive rates would probably result in much lower commission rates. For if volume were to fall, it is doubtful that any associated increase in the competitive level of rates would offset the reduction in actual rates from exposing them to competition. Thus, the elimination of fixed commissions as of April 5, 1971 on that portion of NYSE orders which is in excess of \$500,000 has resulted in a major reduction in effective commission rates on these large blocks [9].

The NYSE [10] has argued that reduced volume, if it occurs, would increase spreads and hence offset in whole or in large part any reductions in brokerage commissions. This position, of dubious validity, is based largely upon an article by Harold Demsetz [2] which shows for a random selection of 200 securities on two days in early 1965 that the number of transactions per day in an industrial stock on the NYSE was inversely related to its spread (for

given price and number of markets on which the security was listed). This article, however, shows almost as high an inverse correlation if the spread is related to number of shareholders instead of to number of transactions, so that at least a high proportion of the apparent effect of transactions may be attributable to the number of shareholders. Moreover, the Demsetz equation indicates that the number of markets on which the security is listed approaches statistical significance, so that increased turnover on other markets might largely offset the effect on NYSE spread of decreased turnover on that Exchange.

A more recent analysis [13] of the determinants of bid-ask spreads for 80 NYSE issues averaged over 19 trading days in March 1969 obtains an even more significant negative effect of trading volume on spread. It also shows a somewhat more significant negative effect on spreads of an index of competition for the issue among different exchange markets. Further, there is a suggestion that the larger the number of institutional investors holding a position in an issue (for given values of trading volume and other relevant variables) the smaller the spread.

Our study carried out still another analysis of spreads for NYSE issues to measure simultaneously the effects of NYSE volume, number of stockholders, size of issue, and competing markets. The results point to very little effect of volume on spread -- once the variables correlated with volume are held constant -- but a statistically significant negative effect of the number of competing markets remains.²² Taken at face value, these results suggest that halving the average volume of trading (somewhat over 10,000 shares per day in the sample) would have much less effect in raising the bid-ask spread than the added competition of one regional exchange would have in lowering the spread.

The evidence cited above suggests that even if competitive commission rates lead to a decrease in NYSE volume, the increase of bid-ask spreads is likely to be small, and the greater competition from other markets might more than offset this increase. Moreover, a recent study by Weeden & Co. [14] of the effect of

opening 30 NYSE stocks to the competition of Third Market makers on NASDAQ provides stronger evidence, for two 30-day periods in early 1971, that subjecting spreads to the forces of competition is more likely to reduce than to increase them. That study indicated a 12% reduction in the average spread of the 30 NYSE stocks quoted on NASDAQ as compared to virtually no change in a group of control Exchange stocks not quoted on NASDAQ. There is no indication here of any adverse effects on spread of competitive commission rates.

Although there is no a priori reason to believe that allocational efficiency is enhanced by a higher volume, empirical tests were carried out to determine whether higher volume might be associated with increases in efficiency. To conduct these tests, the ratios of subsequent earnings per share (E_n where n represents a period in the future) to initial prices (P_0) for a cross-section of individual stocks were regressed upon measures of risk, payout ratios and other relevant variables which might influence the relationship between initial prices and expected subsequent earnings. The unexplained variation in these regressions stems primarily from two sources: first, the normal uncertainty which is associated with any uncertain process even if the underlying distribution were known with certainty²³; second, divergences between investors' subjective assessments of the distributions of the future ratios of E_n to P_0 and the underlying distributions. Insofar as increased trading leads to a reduction of these divergences, allocational efficiency would improve. Hence, the market would tend to price investments of comparable risks more accurately and thereby help business firms to obtain better assessments of their costs of capital.

These ratios of subsequent earnings to initial price (E_n/P_0) for NYSE stocks were regressed for each year over the 1954-68 period upon risk and other relevant explanatory variables, with up to four relationships computed for each year (as n varies over 1, 3, 5, and 8 years).²⁴ Two measures of the unexplained variation in these regressions - the coefficient of correlation and the standard

deviation of residuals -- were finally regressed on the real dollar value of transactions on the Exchange.²⁵ The regressions were also estimated adding a time trend as a second explanatory variable to hold roughly constant other secular developments, such as the rapid growth in the relative importance of institutional trading, which might affect these relationships.

If a higher volume of trading activity is associated with increased allocational efficiency, the coefficients of correlation derived from the first regressions would be expected to be positively, and the standard deviations of the residuals negatively, related to volume. The results provide no systematic evidence of this nature. There is somewhat more evidence that increases in allocational efficiency are positively related to volume of trading than evidence that they are negatively related; but the results are neither consistent nor statistically significant.

Market equilibrium theory provides another way to measure changes in the market's allocational efficiency from one period to another, which allows a much larger number of observations. If realized returns on a stock over time bear a simple linear relation to the return on the stock market as a whole, [1] shows that the return of a stock in a cross-section should be linearly related to its risk as measured by its Beta coefficient. The residual variation in these relationships provides a basis for assessing the effect of trading upon allocational efficiency. Following this logic, standard deviations of residuals from a series of cross-sectional regressions of portfolio monthly returns on risk for 21 periods of 24 months each from July, 1926 through June, 1968 were regressed upon the real volume of NYSE transactions and other relevant variables.²⁶ The series of cross-sections represent 21 non-overlapping two year periods from July, 1926 through June, 1968. This last test²⁷ provides some evidence that allocational efficiency is negatively related to the volume of transactions. The results however are not significant, and volume may well be acting as a surrogate for some secular changes not picked up by a simple linear

time trend.

To summarize, statistical analysis suggests that competitive rates will not have much of an impact on the stock market's allocational efficiency. There are some a priori reasons to believe that increased competition will encourage the growth of those securities firms which display the greatest wisdom in giving investment advice as well as those with the lowest costs. While this tendency is not likely, in our opinion, to be very strong, the allocational efficiency of the market would be expected to be somewhat improved if it is affected at all. The operational efficiency of the market should be significantly improved.

A further argument against competitive rates is that such rates will accelerate the institutionalization of trading and that this will ultimately result in less efficient markets. While it is not clear that the institutionalization of trading will in fact be accelerated, it is of interest to examine the question of whether institutionalization does tend to impair the quality of our markets.

There is no apparent reason for believing that market efficiency, and hence the quality of market prices paid or received by either institutional or individual investors, is or will be impaired by institutional trading. Thus, despite the greatly increased stock market activity by institutions over the past decade or so, a recent study [5] could detect no changes in the allocational efficiency of the market over this period. To assume that this situation is likely to change in the future is to imply that institutions are less likely than other investors to make informed decisions when they buy or sell stock. If this were true, one consequence which would be expected is that institutions would have a poorer investment performance than individuals, but in fact they appear about equal.

While there is no reason for believing that expanded institutional trading impairs the basic allocational efficiency of the market, there is some evidence [12] [7] that sales of large blocks may have a small adverse effect on market price in the sense that recorded prices temporarily fall. Purchases of large blocks do not seem to have a corresponding temporarily stimulating effect. The adverse price effect of sales of large blocks in 1968 and 1969 averaged somewhat over .7 of one percent, but since only blocks associated with down ticks were included in this analysis and total sales of the stock were not held constant, even this relatively small figure may overstate the block effect. Moreover, the small temporary discount seems to be largely dissipated by the end of the day of the block trade.

This effect on price may be regarded as an increase in transaction costs to the institutional sellers of these blocks necessary to mitigate a short-term supply-demand imbalance. While the institution may have to pay a small cost for speedy execution of a large block, there is no significant harm to other investors on a net basis. Investors buying the stock from institutional sellers on a day of a block trade -- a period when non-institutional investors are likely to be net purchasers of stock -- benefit from the temporarily depressed prices.

If the short-run effect of block trades are ignored, there is some indication that the spreads of stocks in which institutional investors are active are reduced rather than increased. Thus, an analysis referred to earlier [13] suggests that the larger the number of institutional investors holding a position in an issue (for given values of trading volume and other relevant variables) the smaller the spread.

While there are no data indicating a worsening of stock market efficiency associated with the past institutionalization of trading, attempts have been made to point out the dangers of this trend by reference to the supposed deficiencies of the bond markets in which institutions, large transactions and dealers

predominate.

It is not clear in what sense the market for U. S. Governments can be considered inferior to the stock market. The Government bond market handles the largest volume of any of the securities markets at probably the lowest transaction costs, reflecting the ability of dealers with substantial capital to manage successfully the problems posed by large blocks. Even for corporate and tax-exempt bonds, there is no conclusive evidence that comparable costs are on the average higher than those for corporate stock. Moreover, there does not appear to be any reason to ascribe the diminished role of individuals in these markets to factors associated with the growing institutional participation [3].

Finally, there is the argument that institutionalization of trading might harm new equity investment in the U. S., apparently in part because of its allegedly adverse effect on the market for outstanding stock issues. An earlier study [5 , pp. 2-4, 40] indicated that there is no reason to believe that the market for outstanding issues would be adversely affected, and indeed the growth in institutional stock ownership over the past two decades may have contributed to the marked rise in stock prices and to the apparent decline in the relative cost of equity financing. The decline in the relative importance of new equity financing immediately after the 1920's obviously had nothing to do with the institutionalization of equity markets, which really did not start until after 1950. Only in recent years, when the institutionalization of markets has been at a peak, has there been a marked resurgence of new equity financing.

VII. CONCLUSION

The evidence shows that the introduction of competitive rates would not appreciably increase the concentration of economic power in the brokerage industry. The exception is national retail firms where there is probably a better than even chance that there would be some modest but not alarming increase in concentration. Nothing in this study has indicated that one group of efficient firms is significantly more likely to be hurt than another.

The main argument in favor of competitive rates is that they can be expected to appreciably raise the market's efficiency. The market for outstanding stocks will clearly be improved, and there does not appear to be any basis for the allegation that new equity investment would be adversely affected. Virtually all classes of investors are likely to benefit. These gains appear possible without any major damage to the structure of the brokerage industry.

FOOTNOTES

1

This monograph was prepared under the auspices of the Rodney L. White Center for Financial Research of the University of Pennsylvania, financed by a grant from Salomon Brothers.

2

The SEC furnished us with any statistical compilation we desired which would not disclose the financial data of an individual firm. This restriction caused us to forego certain types of analyses which we would have liked to perform. For instance, we could not examine plots of residuals.

3

We want to thank both Chairman William J. Casey of the U. S. Securities and Exchange Commission and Chairman John E. Moss of the House Subcommittee on Commerce and Finance for their help in getting us access to these data.

4

Not only did the trading of these small investors become less important over this decade, but from 1967 through 1970, small investors appeared to have liquidated sizable amounts of NYSE-listed stocks. Throughout the decade, they were adding to their indirect investments in the stock market through financial intermediaries like mutual and pension funds.

5

In 1970, the number of income and expense statements on file at the SEC with non-zero security commission income was two less than the number reported in the NYSE publication [11].

6

The New York Stock Exchange has attempted to impute a compensation for the labor services provided by the owners. Further, the Exchange has sometimes treated partnerships as if they were corporations to impute a corporate tax. The calculation of these imputed figures will be discussed below.

7

It would have been preferable to redefine the ranges of average commission per transaction in 1970 to reflect the effect of the surcharge. This was infeasible since this study was not provided with the names of the firms and their average commissions per transaction to examine the accuracy of any new scheme for classification. The Institutional Investor Study [12] developed its ranges with such information. The error in using 1969 data to classify firms in 1970 is that a firm, properly identified as a retail firm in 1969, may have so changed its mix of business that it is no longer a retail firm in 1970 even after an adjustment is made for the surcharge. Whenever the subsequent analyses may be sensitive to this type of error, retail and mixed firms will be combined into one group.

8

This type of argument would seem to require the setting of maximum rates and not minimum rates as has been the practice of the NYSE.

9

The Exchange [10] recognizes this characteristic as important for its argument about destructive competition.

10

Interest expenses will of course also vary with the level of interest rates. Changes in price levels also would affect the relative costs of the services demanded by brokerage firms.

11

That many types of expenses did not vary concurrently with revenue does not mean that these costs are fixed in the same sense as some costs are fixed to a public utility. The difference is the legal obligation to incur the cost. A public utility which finances a new plant with long term debt must if it is not to go into default pay the interest on the debt even if there is no foreseeable demand for the services of the plant. Most of the expenses incurred by brokers do not stem from such long-term obligations and are thus not fixed in the usual economic sense. If a broker thought a reduction in volume was permanent, he could reduce most of his expenses substantially in a short period of time, like a month. That he chooses not to adjust expenses to changes in volume immediately probably reflects his feelings that the decline is only temporary. Thus, some of the expenses of brokerage firms may not vary directly with revenue because of management decisions and not because of a legal obligation.

Although expenses for brokerage firms in the aggregate may have only a small fixed component, fixed costs may be much more important for some types of firms. To examine this possibility, tables like Table 3 were prepared for 1965 through 1970 for institutional, mixed, and retail firms with a further breakdown of mixed and retail firms into regional and national. The expenses for each group varied in roughly the same way as they did in the aggregate.

12

If there are large ranges of constant economies of scale, the structure would be indeterminate with the possibility that some very large firms might exist.

13

With the exception of the data for Merrill Lynch, these ratios were derived from income and expense statements filed by member firms which are given to the Securities and Exchange Commission at its request. The data for Merrill Lynch was taken from a prospectus dated June 23, 1971. A comparison of the data contained in the prospectus with the testimony of Bernard H. Garil [6] indicated that at least in 1967 there was no difference between the figures given in the prospectus for security commission income and those filed with the Exchange.

14

Also from 1968 through 1970, the total number of NYSE brokerage firms servicing the public decreased from 386 to 333 according to NYSE figures. This decrease in number means that some of the weaker firms in the industry were probably forced out of business leaving an industry of stronger firms at the end of 1970 than at the start of 1969.

15

For institutional firms, the paucity of firms and the requirement of confidentiality allowed the calculation of concentration ratios only for 1968 through 1970.

16

One explanation of this relative difference in concentration ratios is that price competition is more effective than non-price competition. Firms may have been able to expand their non-commission revenues to take advantage of economies of scale by competitive pricing, whereas the fixed rate schedule limited such expansion in commission business. If this argument is correct, one would expect a modest and not alarming increase in concentration under competitively determined commission rates assuming similar economies in the commission business.

17

The same conclusion appears valid through 1970, but the 1970 ratios for mixed and retail firms are suspect because of the use of 1969 data to classify the firms.

18

The experience before the approval of the surcharge in April 1970 gives some indication of the possible structure of competitive commission rates. In addition to firms which refused small orders, at least 19 well-known firms including many of the largest retail houses are known to have charged more than the minimum rate for small orders. The most typical of these rates was \$15 or the minimum prescribed commission, whichever was larger. If these firms in raising their rates above the minimum increased them to their breakeven point, there is some presumption that before customers shifted to other firms, orders involving a commission of roughly \$15 or so might decrease while those below might increase. Since there has been inflation since 1970, the breakeven figure might have increased, but certainly it has not increased say above \$40. Under the new commission schedule, an order of approximately \$500 will generate a commission of roughly \$15, while an order of \$2,000 will generate roughly \$40 in commissions.

After investors have switched to firms which are more efficient at servicing small orders, it is possible that commission rates might ultimately drop for all sizes of orders. The current minimum commission rates and other restrictive practices build in inefficiencies in numerous ways such as the competitive disadvantage faced by non-exchange firms. In a more competitive world, the whole structure of the brokerage industry might change leading to the provision of brokerage services at rates below those suggested here.

19

The average values of TP_3/A for 1968 were incorrectly calculated due to a difference in definition between the 1970 and 1968 income and expenses reports, which was not known in advance.

20

The frequent low values of \bar{R}^2 imply substantial unexplained variation in profitability for any group of similar size firms and underwriting activity. An examination of the scatter plots in [6] gives further confirmation to the wide variability of profits for similar size firms.

21

It was originally planned to use the transaction revenue study of 1969 in conjunction with the income and expense data of that year in a regression similar to (2). In such a regression, the variable $N \cdot \ln(V/N)$ would have been replaced with the sum of the logarithms of the values of the actual transactions. Time however precluded this type of analysis.

22

The following regression was run for a random sample of 199 NYSE common stocks for the fourth quarter of 1969:

$$S = .0225 - .00003 V - .00001 H + .00043 Z - .00067 N - .00018 P$$

$$\begin{array}{cccccc} & (-.55) & (0.55) & (.45) & (-2.08) & (-6.32) \end{array}$$

$$\bar{R}^2 = .26 \quad DW = 1.82$$

where S is the difference between ask and bid prices per share as of December 31, 1969 as a ratio of price, V is average daily share volume on the NYSE during the quarter (in thousands), H is the number of stockholders as of December 31, 1969 (in thousands), Z is the market value of the stock outstanding on that same date (in billions of dollars), N is the number of exchange markets on which the stock was listed on that date, P is the average price of the stock during the quarter, \bar{R}^2 is the coefficient of determination adjusted for degrees of freedom, DW is the Durbin Watson statistic, and the numbers in parentheses represent t -values. The only statistically significant variables are N and, even more so, P . When the regression is recomputed with the dependent variable S expressed in dollars rather than as a ratio of price, basically the same result is obtained, except that the coefficient of P (which is again highly significant) now has a positive sign.

23

With a large number of securities, the unexplained variation not accounted for by general market movements can be substantially diversified away.

24

The relationships fitted were $(E_{ni} / P_{oi})' = f \left[\left(\frac{D}{E} \right)'_i, \beta_i, \sigma_i \right]$ where i represents the i^{th} stock, the prime indicates that the ratio for the i^{th} stock is divided by the corresponding ratio for the market as a whole, (D/E) is the average dividend yield, β the Beta coefficient, and σ the standard deviation of the rate of return. Further relationships added either the expected growth rate in earnings per share (based on the growth rate in the preceding five years) or the initial E_0/P_0 ratio as other independent variables to explain E_n/P_0 . All NYSE stocks covered by the Compustat tape were included.

25

The real volume of NYSE transactions was estimated by deflating the current dollar value by the S&P 500 stock price index and was then expressed in log form.

26

The manner in which these portfolios were selected is described in [1].

²⁷The actual regression fitted was $SD = .00258 + .00112 V + .00813 |R_M - R_F| - .00009 t$ with $\bar{R}^2 = .35$ and $DW = 2.15$, where S.D. is the standard deviation of (-2.18)

residuals, V is the log of the value of transactions on the NYSE deflated by the S&P 500 price index (linked ultimately to the 229 index prior to 1928), R_M is the average monthly market rate of return, R_F is a proxy for the risk free rate measured by the six month commercial paper rate, $||$ represents absolute value, and t is the time trend. $|R_M - R_F|$ was used as an additional explanatory variable to hold constant any residual market effects. To obtain the value of transactions on the NYSE prior to January 1935, the published share volume statistics were multiplied by an average market price of shares traded estimated from the regression of the average price of shares traded on the average price of shares listed over the 1935-70 period. If \bar{R}^2 instead of SD for each of the 21 cross-sectional relationships is regressed on V , $|R_M - R_F|$ and t , the coefficient of V is positive with a completely insignificant t-value of .23, and the coefficient of determination is reduced to .09.

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