Do Analysts Generate Trade for Their Firms?

BY PAUL J. A. IRVINE

EVIDENCE FROM THE TORONTO STOCK EXCHANGE

Few practitioners would doubt the idea that analysts generate trade for their firms. Academics have also suggested that the ability to generate trade is an important determinant of analysts' coverage decisions and the properties of their forecasts. However, the relation between analyst coverage and trading volume has never been confirmed using brokerage-firm level data, hence uncertainty about the economic importance of this relation remains. Instead, prior studies rely on conventional Wall Street wisdom to support the assumption that analysts generate trade for their firms. This paper provides direct empirical evidence on the relation between analyst coverage and brokerage-firm volume. To examine this relation I use a unique data set obtained from the Toronto Stock Exchange (TSE) that identifies the broker(s) involved in individual trades. Unlike New York Stock Exchange (NYSE) and Nasdaq transaction data, these data can be used to disaggregate stock volume into brokerage-firm volume and the strength of the relation between analyst coverage and brokerage volume can be directly measured.

The extent to which analysts generate trade for their firms is clearly a factor of first-order importance in the process that generates analysts' forecasts. Bhushan (1989) finds that the level of analyst coverage is positively related to trading volume. O'Brien and Bhushan (1990) suggest that trading volume determines the level of analyst coverage and hence the amount of research produced concerning a particular firm. They demonstrate that analyst coverage and institutional ownership are jointly determined; institutional investors tend to own stocks that brokerage analysts choose to cover while, at the same time, analysts choose to cover firms that have high levels of institutional ownership. One implication from this research is that the level of analyst coverage in a particular stock depends on the potential brokerage revenue coverage provides. This assertion rests on the assumption that analyst coverage is driven, at least in part, by the ability of the analyst to generate trade in a particular stock.

The ability of analysts to generate trade is a key assumption in McNichols and O'Brien (1997), who contend that potential trading revenue will influence an analyst's decision to release a particular forecast. For example, analysts may decide either to issue or withhold a forecast that contains bad news by trading off the

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costs of issuing (e.g., deterioration in relationships with company management) against the costs of withholding: namely lost brokerage revenue that could have been generated by issuing the forecast. Francis and Willis (2000) find that average monthly stock volume is positively related to analysts' forecast optimism and conclude that this result is consistent with analysts' incentives to generate trade with their forecasts. These results suggest that the ability of analysts to generate trade can affect the properties, such as earnings optimism, of observed analysts' forecasts.

This paper examines the relation between an analyst's decision to cover a stock and brokerage-firm volume in that stock. I compare brokerage-firm volume in covered stocks against brokerage-firm volume in stocks they do not cover. I find that analyst coverage of a particular stock results in significantly higher broker volume in that stock: on average, brokers increase their market share in covered stocks by 3.8 percent relative to uncovered stocks. Using an average institutional commission rate of six cents per share (Greenwich Associates 1993), this represents incremental brokerage revenue of approximately C$150,000 per stock per year. Brokerage-firm clients appear to reward their brokers, through trading commissions, for providing analyst coverage. These results support the idea that analysts' coverage decisions depend, at least in part, on the amount of trading revenue they expect their reports will generate.

THE BROKERAGE ANALYST AND CLIENT TRADING ACTIVITY

There is considerable evidence that some analysts' reports can be used to trade profitably. Bjerring, Lakonishok and Vermaelen (1983) and Brown, Richardson and Trczinka (1991) examine the stock price impact of Canadian analysts' reports. Their results are similar to U.S. studies by Elton, Gruber and Grossman (1986) and Womack (1996). The results in these papers suggest a profitable trading rule: buy a security when a brokerage analyst recommends purchase, sell it when the analyst recommends sale. Despite this evidence, the contention that brokers can directly profit from providing these recommendations remains untested.

The primary method of payment for research is through 'soft dollar' commissions. Instead of paying cash for research services, institutions pay through commissions on their trading activity. The soft dollar market is important; for instance, 506 of the largest U.S. institutional investors allocated $769 million in commissions for research in 1993.[1] All of the brokerage firms examined herein reported to *Nelson's Directory of Investment Research* that institutions paid for their research coverage with soft dollar commissions. The practice of directing commissions to Canadian brokerage firms enjoys the same safe harbour provisions as exist under Section 28 (e) of the U.S. Securities Exchange Act of 1934. The payment of soft dollars for the receipt of analyst research is specifically mentioned in the Ontario Securities Act (the Act).[2] Specifically referred to in the Act as 'soft dollar deals', the Act provides for payment through commissions for such investment decision-making services as: "advice as to the value of securities and the advisability of effecting transactions in securities."[3]

The existence of a soft dollar market in Canada makes it reasonable to assume that brokerage-firm clients will direct some of their trades back to the broker that provides them with analysts' research. However, prevailing institutional arrangements in the market for soft dollar commissions suggest that determining the existence of a relationship requires a relatively long time-series of trading data. Research directors at Canadian brokerage firms suggest that over 50 percent of brokerage volume with an institutional client is set in advance. This practice could limit the ability of an institution to reward a broker for a particular analyst report. For institutions, rewarding analysts' services is an adaptive process. Analysts that provide excellent services over the prior period are rewarded with increased allocations in the subsequent period.

One reason analyst coverage could be associated with greater brokerage volume is because analysts tend to cover high-volume stocks. However, high-volume stocks tend to attract more competition from other brokerage-firm analysts, who are themselves trying to generate trade. The volume pie is larger in high-volume stocks, but it must be cut into more pieces. Hence, brokerage-specific volume data is particularly useful in this setting. We might expect to see a relation between coverage and volume due to the existence of the soft dollar market. But there is no explicit contract that ties institutional trading to the receipt of analysts' reports; therefore the client is not legally obligated to trade with the brokerage firm that provides a particular report (McNichols, 1990). Michaely and Womack (1999) go further and

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claim that, for institutional customers, trading with a different broker is the rule rather than the exception. Even if the nature of the soft dollar market suggests a quid pro quo relationship, the institution receiving analyst coverage on stock A may respond with trades in stock B.

The primary empirical hypothesis in the paper is to test whether brokerage-firm volume in covered stocks is greater than brokerage-firm volume in uncovered stocks. To empirically test this hypothesis I measure brokerage market share rather than brokerage share volume. Share volume is not generally a statistically well-behaved variable. Ajinkya and Jain (1989) and Tkac (1999) find that volume generally exhibits positive skewness. Because analysts tend to cover high-volume stocks, a few outlying covered stocks that have particularly high volumes could bias the test against the null. As an alternative to share volume, I use brokerage Market Share: defined as brokerage-firm share volume normalized by total volume in the stock. Specifically, the Market Share of broker 'j' for stock 'k' is calculated as the total volume traded by broker 'j' in stock 'k' over the sample period of 'T' days, divided by the total volume in stock 'k'. In Equation (1) total volume for stock 'k' is represented as the sum of share volume for all 'J' brokers in the market:

$$\text{(1)} \qquad \text{Market Share}_j^k = \frac{\sum_{t=1}^{T} \text{Share Volume}_j^k}{\sum_{j=1}^{J}\sum_{t=1}^{T} \text{Share Volume}_j^k}$$

Empirically, Market Share has two desirable properties. It is significantly positively correlated with broker Share Volume. This is important since share volume is directly related to brokerage revenue. However, Market Share is uncorrelated with total stock volume, thus removing total stock volume as a source of bias in these tests.

The primary hypothesis is evaluated with a test of broker Market Share in covered stocks against broker Market Share in uncovered stocks. I evaluate significance using a one-tailed test of the null that mean covered-stock brokerage-firm volume is equal to mean uncovered-stock brokerage-firm volume.

EMPIRICAL RESULTS

This paper uses a transactiondata set obtained from the TSE, the largest stock exchange in Canada. On the TSE, every trade goes through a seat holder on the exchange, a broker who can trade as an agent or as a principal. When the TSE documents a trade, they record the time, volume and price information as well as two brokerage-firm identification codes. The TSE assigns each seat holder a unique two-digit code. As a result of this system, the broker that sold the security and the broker that bought the security are identified for each trade. Volume is assigned to a broker when their identification code is attached to a trade. The TSE sample consists of every trade of the largest 100 companies on the TSE that occurred between September 1, 1993 through August 31, 1994. Ninety-seven of these companies are in the TSE 300, the TSE's primary index, and they comprise 78.2 percent of the market value of the index. Analyst coverage for these 100 firms is determined by examining *Nelson's Directory of Investment Research*. *Nelson's* reveals that a total of 22 different brokerage firms provide research on at least one of these companies.

Table 1 presents summary information on brokerage-firm volume in the sample stocks. The first column in Table 1 lists the 22 brokers in the sample. The next two columns present mean broker share volume and mean broker Market Share over all 100 stocks; both covered and uncovered stocks. The fourth column presents the number of sell-side analysts each broker employs (Number of Analysts) and the final column presents the number of sample stocks covered by each broker (Stocks Covered). Brokerage firms with larger market shares tend to employ more analysts and cover more stocks. Smaller brokers, all else equal, will have less commission revenue available to support a research

TABLE 1 ANALYST COVERAGE AND BROKERAGE VOLUME

This table presents information on brokerage trading activity in the one hundred largest stocks traded on the TSE. In the year of the study, Nelson's Directory of Investment Research listed 22 different brokerage firms that provided coverage on these stocks. Mean Broker Share Volume is the average daily volume (number of shares traded) per stock traded by the brokerage. Mean Broker Market Share is the average daily market share of the brokerage. Number of Analysts is the total number of sell-side analysts the broker employs. Stocks Covered represents the number of stocks in the sample covered by the brokerage. The maximum possible is 100.

Broker	Mean Broker Share Volume	Mean Broker Market Share	Number of Analysts	Stocks Covered
Barclay De Zoete Wedd	2265	1.45	9	58
BBN James Capel	2892	1.00	12	55
Bunting Warburg	4535	1.96	13	66
Burns Fry	22667	9.64	22	97
Credifinance	202	0.12	6	36
First Marathon	21557	6.43	6	41
Goepel Shields	1073	0.46	6	32
Gordon Capital	26043	6.83	6	52
Levesque Beaubien	4716	3.61	11	63
Loewen Ondaatje	3997	1.70	7	37
Majendie	2581	1.39	5	40
Marleau Lemire	1280	0.68	13	1
Midland Walwyn Capital	11393	6.00	12	57
Nesbitt Thomson	16251	6.89	20	92
RBC Dominion	24381	13.58	20	94
Research Capital	983	0.67	6	43
Richardson Greenshields	13135	5.48	14	81
Sanwa McCarthy	762	0.49	9	35
ScotiaMcLeod	16902	6.17	15	77
Sprott	245	0.17	7	34
Wood Gundy	21195	8.62	13	82
Yorkton	2114	1.05	9	10

TABLE 2 TESTS OF COVERAGE AND BROKERAGE MARKET SHARE

This table presents test statistics for three tests of the association between analyst coverage and brokerage-firm market share. Covered Market Share is the average market share in stocks the broker covers. Uncovered Market Share is the average market share in uncovered sample stocks. T-test p-value is a one-tailed significance level for the null hypothesis of no difference between covered Share Volume and uncovered Share Volume. Market Share Ratio represents the ratios of two averages; average brokerage Market Share in covered stocks is divided by average brokerage Market Share in uncovered stocks. The Market Share Ratio is used in a binomial test of the null hypothesis that the Market Share ratio is equal to one. The test statistics and significance levels for this test are presented at the bottom of this column.

Broker	Covered Market Share	Uncovered Market Share	T-test p-value	Market Share Ratio
Barclay De Zoete Wedd	1.65	1.17	0.07	1.41
BBN James Capel	1.41	0.41	0.01	2.87
Bunting Warburg	2.53	0.85	0.01	2.96
Burns Fry	9.71	7.25	0.10	1.34
Credifinance	0.14	0.11	0.10	1.23
First Marathon	9.39	4.37	0.01	2.15
Goepel Shields	0.86	0.27	0.01	3.14
Gordon Capital	8.09	5.47	0.01	1.48
Levesque Beaubien	4.13	2.72	0.08	1.52
Loewen Ondaatje	2.17	1.43	0.02	1.52
Majendie	1.22	1.50	0.60	0.81
Marleau Lemire	2.37	0.66	n/a	3.58
Midland Walwyn Capital	6.27	5.65	0.13	1.11
Nesbitt Thomson	6.99	5.73	0.10	1.22
RBC Dominion	13.72	11.43	0.02	1.20
Research Capital	0.71	0.64	0.18	1.11
Richardson Greenshields	5.68	4.62	0.07	1.23
Sanwa McCarthy	0.78	0.33	0.01	2.36
ScotiaMcLeod	6.83	3.97	0.01	1.72
Sprott	0.18	0.17	0.43	1.06
Wood Gundy	8.92	7.25	0.03	1.23
Yorkton	1.60	0.99	0.12	1.62
Number > 1.00				21
p-value				.01

TABLE 3 THE AVERAGE IMPACT OF COVERAGE ON BROKERAGE MARKET SHARE

This table presents OLS regression estimates of the average impact of analyst coverage on brokerage-firm market share. The dependent variable consists of 2200 observations of brokerage-firm market share. Market share is calculated from September 1993 to August 1994 for the 22 brokers that provide analyst coverage on at least one of the 100 largest (market value) stocks on the Toronto Stock Exchange. Coverage is a dummy variable set to one if Nelson's Directory of Investment Research indicates the broker provides coverage on a particular stock. NA_Broker is the total number of sell-side analysts employed by the broker. NA_Stock is the total number of analysts covering a stock. Coverage * NA_Stock is an interactive dummy variable.

Dependent Variable: Market Share

Model	(1) Coefficient (standard error)	(2) Coefficient (standard error)	(3) Coefficient (standard error)	(4) Coefficient (standard error)
Intercept	1.80**	-1.23**	3.69**	-2.06**
	(0.17)	(0.29)	(0.49)	(0.61)
Coverage	3.83**			7.14**
	(0.24)			(0.90)
NA_Broker		0.45**		0.37**
		(0.04)		(0.04)
NA_Stock			0.01	0.01
			(0.04)	(0.05)
Coverage NA_Stock				-0.35**
				(0.08)
Adjusted R^2	10.6%	14.4%	0.0%	21.6%

**significant at the 0.01 level

department. One broker covers just one of the large-cap stocks in the sample, concentrating instead on small and mid-cap stocks.

Table 2 presents the primary tests. Columns two and three present average Market Share in covered stocks and average Market Share in uncovered stocks for all 22 brokers in the sample. In the full sample mean (median) Market Share in covered stocks, 5.63 (2.57) percent, is significantly greater than mean Market Share in uncovered stocks, 1.80 (0.29) percent. Column 3 presents the results of difference in means test of average broker Market Share in covered stocks against average broker Market Share in uncovered stocks. The difference in means tests on individual brokers' Market Share rejects the null of equal market share in 10 of 21 cases at the 5 percent significance level. Sixteen of 21 brokers reject the null at the 10 percent significance level. The rejections all occur because the brokers' Market Share in covered stocks is greater than their Market Share in uncovered stocks. These results suggest that brokers generate more trade in stocks that their analysts' cover.

This is an important result because it provides insight into the microeconomics of the brokerage industry. Since analyst services are costly, we should see incremental benefits such as increased trading associated with the analyst's decision to provide coverage. The confirmation of this link is evidence that analyst coverage influences their clients' choice of broker.

The brokerage firms in our sample exhibit considerable diversity in their size and their average Market Share. In addition, the stocks in the sample exhibit considerable variation in average trading volume. Given this diversity, it is difficult to obtain firm conclusions on the average impact of analyst coverage on brokerage-firm volume without additional analysis. A simple regression analysis provides a convenient way to summarize the average impact of analyst coverage on brokerage-firm Market Share.

The Market Share of a particular broker in a particular stock is the dependent variable in the regressions presented in Table 3. Data for all 22 brokers over the 100 stocks in the sample produces the 2200 observations used in the regression. An analysis of the average impact of analyst coverage is given by Equation (2):

$$(2)\quad \text{Market Share}_{j,k} = ß_0 + ß_1\,\text{Coverage}_{j,k} + ß_2\text{NA\_Broker}_j + ß_3\text{NA\_Stock}_k + ß_4\,\text{Coverage}_{j,k} * \text{NA\_Stock}_k + \varepsilon_{j,k}$$

Where:
$Market\ Share_{j,k}$ = market share for broker 'j' in stock 'k';
$Coverage_{j,k}$ = dummy variable set to 1 if broker 'j' covers stock 'k'
NA_Broker_j = the number of analysts employed by broker 'j'
NA_Stock_k = the number of analysts covering stock 'k'
$Coverage_{j,k} * NA\_Stock_k$ = an interactive dummy variable calculated by multiplying Coverage by the number of analysts that cover the stock.

The coefficient of Coverage represents the estimate of the average increase in brokerage Market Share resulting from analyst coverage. I expect this coefficient to be significantly positive. The number of analysts employed by the broker, NA_Broker, is a variable included to control for the size of the brokerage firm. Given that brokers with large research staffs have to do more trading to support that staff, I expect the coefficient of NA_Broker to be positive. The coefficient of the interactive dummy variable, Coverage* NA_Stock, is expected to be significantly negative since, all else equal, the greater the level of competition for trading revenue, the smaller the impact of the decision to provide coverage.

The results of OLS estimation of Equation (2), reported in Table 3, indicate that providing coverage significantly increases brokerage-firm Market Share by 3.83 percent. As expected, the size of the brokerage-firm research staff is positively related to Market Share. In the univariate regression reported in Column 3, the total number of analysts covering a stock has no effect on brokers' Market Share. However, Column 4 shows that expected Market Share from providing coverage is declining in the number of analysts covering the stock. The coefficient on the variable Coverage* NA_Stock is negative and significant: this suggests that diminishing marginal returns characterize the brokerage industry. The more competition in a particular stock, the less market share a broker can expect to capture by providing coverage. When deciding what firms to cover, brokers trade off the possibility of capturing a larger market share in lightly covered (and likely low-volume) stocks against the smaller market share they are likely to capture in the more competitive, high-volume stocks.

CONCLUSION

This paper directly documents a positive relation between analysts' coverage and brokerage-firm volume using a unique data set from the Toronto Stock Exchange. Over an entire year, analyst coverage is positively associated with brokerage-firm volume. Brokers trade significantly more shares and have higher market shares in covered stocks than they do in uncovered stocks. This result is consistent with compensation for analysts' research services coming from clients' directed commissions. These results provide empirical support for O'Brien and Bhushan's (1990) assumption that brokerage-firm trading volume is an important determinant of analyst coverage decisions, and for McNichols and O'Brien (1997) who contend that brokerage-firm trading volume affects analysts' decisions of when to publicly release a forecast. ❖

This article is a practitioner version of a paper that appeared in the Journal of Accounting and Economics. 30 (2001) 209-126

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1 Source: Greenwich Associates (1993).
2 The Ontario Securities Act is generally adopted as the standard in the other provinces of Canada.
3 Consolidated Ontario Securities Act and Regulation, 1995. Ontario Securities Commission Policy Statements, section 1.9, subsection II, (a).