Investor Relations, Liquidity, and
Stock Prices¹

by

Michael J. Brennan²
and
Claudia Tamarowski³

¹ We are grateful to Carla Hayn and Marilyn Johnson for helpful conversations and suggestions.

² Goldyne and Irwin Hearsh Professor of Banking and Finance, University of California, Los Angeles, and Professor of Finance, London Business School.

³ Bocconi University
Investor Relations

The investor relations profession is concerned with the interface between the firm and its management on the one hand, and the firm's equity shareholders on the other. Although the first investor relations department was established by General Electric as long ago as 1952, and although the National Institute of Investor Relations, which was set up in 1969, now has over 4,200 members, the role of investor relations is one that has largely escaped scientific analysis and academic scrutiny. This lack of attention is due in part no doubt to the intellectual supremacy of the efficient markets paradigm, which has lasted from the beginnings of rigorous empirical research in finance in the late 1960's until recently. In the idealized setting of the efficient market, a firm's stock price is set taking proper account of all available information, and there is little that the firm or its professional advisors can do about the price, beyond pursuing appropriate real investment and financial policies. Sufficient conditions for the validity of the efficient markets hypothesis are that information about firms is costless, available to all and, most importantly, can be easily understood by all potential investors. These sufficient conditions are clearly not satisfied in practice, so that it is an empirical matter whether prices are in fact set as though they were satisfied. There are reasons to suspect that prices might not conform to the predictions of the

"It is fully as important to the stockholders that they be able to obtain a fair price for their shares as it is that dividends, earnings and assets be conserved or increased.

It follows that the responsibility of management ....includes the obligation to prevent ..the establishment of either absurdly high or unduly low prices for their securities"

Graham and Dodd, Security Analysis, 1951.
idealized market theory and, as we shall see, considerable evidence to that effect.

Firms are complex institutions with strategies, plans, commitments, personnel policies, competitive threats, and managerial succession problems, as well as patents, research programs, and products that are often technically sophisticated; all of these characteristics of the firm can have a major effect on the value of its shares; yet none of them can be assessed adequately by reading the traditional financial statements that firms publish, or even the footnotes and commentary that accompany them; and in many cases considerable technical (as well as financial) expertise is required to understand the issues that are important for determining firm value. Interpretation and communication of this information to financial markets is effected largely through the intermediation of financial analysts of whom there are about 2,400 in the US. These analysts are often highly paid, in some cases earning as much as $10m per year, belying the predictions of the strong form efficient markets proponents that such analysis is worthless. It is not surprising therefore that, after a long period in which academics were sceptical of the value of investment analysis, there are now several studies attesting to the informational content of analyst reports.

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One way in which firms respond to the inadequacy of financial statements is by direct contact with analysts. Quarterly telephone conference calls between firms and analysts have become common in the past five years. They are especially common in growth industries where traditional financial statements are least informative. See Sarah H. Tasker, 1998, Bridging the Information Gap: Quarterly Conference Calls as a Medium for Voluntary Disclosure, *Review of Accounting Studies*, 3, 137-167.


In making their decisions about the firms on which to concentrate their efforts, analysts will be influenced by the relative costs and benefits of acquiring information about different firms. From the analyst’s point of view, the benefits will depend mainly\(^7\) on the size of the firm and the number of potential investors who will be interested in the analyst’s conclusions\(^8\). Other important considerations will include the liquidity of the market for the firm’s shares which will determine the extent to which the information can be exploited before the price moves to reflect it; and the likelihood of discovering valuable new private information by diligent analysis of the firm. The costs to the analyst of acquiring information about a firm will depend on the size and complexity of the firm and its operations, but also on the steps that the firm takes to make information easily available to its investors. This suggests that firms will be able to influence the extent to which they are followed by analysts by their policies with respect to information disclosure.

“Mediobanca....and its galaxy of related firms, still present a picture of varying degrees of murkiness. ..Yet even Mediobanca...appointed an investment relations officer in March and is thinking of making its first ever presentation to analysts in September.

Perhaps it should offer some advice to two of its main shareholders. Banca Commerciale Italiana and Banca di Roma. The former is unable to provide information on its investor relations; the latter refuses to do so”

(Economist, August 8\(^{th}\), 1998)

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\(^7\) An increasingly important aspect of investment analysis is its role in attracting underwriting business to an investment bank.

\(^8\) Since most large institutional investors are precluded from selling short, the main target of analysts is the current owners of the stock who may either buy more shares or sell, as well as non-owners - the latter will generally only be interested in buy recommendations. This helps to create a bias towards positive reports, and also leads analysts to concentrate on large firms in which the number of current owners who are potential sellers is greatest.
A firm’s policy with respect to disclosure of information about itself to current and potential investors is perhaps the most significant aspect of its investor relations management. We shall show first that a firm’s attention to investor relations tends to increase the number of investment analysts who follow the firm and publish earnings forecasts for it; secondly, that the number of analysts who follow a firm affects the liquidity of the trading in the firm’s shares; and thirdly, that liquidity, by reducing the cost of transacting in the firm’s shares, reduces the firm’s cost of capital and thereby increases the stock price. There is thus a link between a firm’s investor relations policy and its stock price.

- Investor relations affect analyst following
- Analyst following affects share liquidity
- Liquidity affects the cost of capital
- The cost of capital affects the share price

Properly speaking, investor relations management embraces a broader remit than simply disclosing information to investors and analysts: for example, a systematic program of investor relations can increase the credibility of a firm’s investment or product strategy and such credibility can prove invaluable when a firm is attempting to take over another firm, ward off an unwanted suitor which is soliciting support for a merger proposal or a proxy contest, or approach the capital market for additional finance. A particularly bad example of bad investor relations is illustrated in the box. The experience of Olivetti illustrates that no amount of cosmetic investor relations work can substitute for a lack of trust between a company’s management and its shareholders.
An Annus Horribilis for Investor Relations at Olivetti

- January 6th, 1996 “Olivetti rights fully subscribed” $1.42 billion

- January 30th, 1996 “Olivetti shareholders should be spitting blood. Only last month they were induced to stump up $1.4 bn. in new equity. Now it turns out that losses ..are likely to be worse than investors were led to believe.. Olivetti says the full picture emerged only after the rights issue, but it is hard to believe.. Olivetti also denies leaking details of the profits plunge to analysts... The latest rights issue was supposed to mark an end to Olivetti’s record of failing to deliver on promises.”

- September 25, 1996 “The imbroglio at Olivetti ...has raised serious questions for international fund managers. In Italy, the most important business is still conducted behind closed doors, with small shareholders and fund managers on the outside.

        The number of European quoted on the NYSE has risen sharply... to qualify they must be much more open... complying with American regulations on disclosure of information to shareholders.”

- October 23rd, 1996 “Olivetti alleges Mr Francesconi caused serious damage to the company by calling into question the accuracy of the group’s accounts - statements that forced its shares to be temporarily suspended... both Mr Benedetti and Mr Caio, another former chief executive are under investigation for alleged false reporting of company accounts.”

- November 6th, 1996 “Mr Carlo De Benedetti was under investigation for alleged insider dealing in shares.”

- November 29th, 1996 “De Benedetti told parliamentary deputies that clients and investors were distancing themselves from the company because of the distrust, the investigations and the denigration.”

    *Financial Times.*

However, in this paper we are primarily concerned with the first, narrower, role of investor relations, as simply information disclosure. Before turning to the empirical evidence on the effect of investor relations efforts on the size of a firm’s analyst following, we shall briefly summarize the development of professional investor relations management in the US.
The Development of Investor Relations Management

Recognition of the importance of dealing with a company's shareholders seems to have emerged first in the early 1950's as the post-war prosperity and stock market boom attracted large numbers of individual shareholders back into the market. In 1954 institutions held less than 24% of total US equities, compared with over 50% today. As the official history of the National Investor Relations Institute notes: "the small size and relative inactivity of institutional investors in the period 1950-70 stands in sharp contrast to the rapid growth and rising activism of individual owners. It is they who fostered investor relations at the outset." Individual corporate gadflies such as Lewis Gilbert peppered directors at annual general meetings with pointed questions about their devotion to shareholder interests, while corporate managers discussed what it was that shareholders wanted - liberal dividends, frank disclosure and a striving to increase the stock price - claimed one manager. It is not surprising that in this atmosphere companies, or more precisely corporate managements, fought back with public relations campaigns. General Electric Co. was

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9 This section draws heavily of *The Origins of NIRI*, by DeWitt C. Morrill, which is available on the National Investor Relations Institute website: http://www.niri.org.

10 Between 1952 and 1965 the proportion of the population owning stock directly rose from 4% to 15%.

11 In 1950 Gilbert and his brother were attending over 100 meetings a year. The concerns they raised are not dissimilar to the concerns of stockholders today. See Lewis D. Gilbert, Management and the Public Stockholder, 1950 *Harvard Business Review*, 38, 73-83. A sign of the times was the 1955-56 movie, "The Solid Gold Cadillac" in which the heroine bested a cold-hearted management at the annual general meeting.

the first company to create a specific department in charge of investor relations in 1953, although other companies had recognized the potential of small shareholders as purchasers of company products\textsuperscript{13}. Further impetus came from the rapidly growing new profession of investment analysts and their demand for increasingly detailed financial information about the corporation, which exceeded the capabilities of the traditional public relations firms to which managements had initially turned; the media also were sceptical of reports issued by the public relations departments of firms, and it was increasingly necessary to devise specialised channels for communicating with the burgeoning army of sophisticated analysts and financial journalists. By 1958 the American Management Association was holding conferences on Investor Relations. Further conferences and meetings gradually gave birth the Investor Relations Association which, in 1969, metamorphosed into the National Investor Relations Institute. In 1980 a similar society was formed in London.

The 1980's saw increasing importance for investor relations as the active market for corporate control made it more imperative than ever for corporate managements to be concerned with their stock prices and to communicate to the investing public the credibility of their vision and strategy lest they lose the loyalty of their shareholder base in a takeover contest. The increasing activism of institutional investors, following the example of the public pension funds such as Calpers, and the formation of individual shareholder rights groups such as The United Shareholders Association (which was founded in 1986 and disbanded in 1993) has made the profession of investor relations management more important than ever. This can be seen, not only in the number of members of the National Investor Relations Institute, but also in their

\textsuperscript{13} In 1950 Ford Motor Company's stock issue was targeted at holders of 200 shares or less in a conscious effort to create a body of loyal customers.
compensation. A recent poll found that senior investor relations officers earned an average of $263,000 in 1997, with the elite earning over half a million dollars\textsuperscript{14}.

A potentially dark side to investor relations activities has arisen among small firms which lack the resources to employ their own professional investor relations people; certain investment banks make it a practice to approach such firms, offering to produce a research report to be circulated among investors in return for payment in options or warrants — such arrangements clearly smack of conflicts of interest\textsuperscript{15}, although their existence attests to the perceived importance of investor relations activities for maintaining the stock price.

II

Investor Relations, Investment Analysts and Information

In an early investigation of how investment analysts choose which firms to follow, Ravi Bhushan\textsuperscript{16} of MIT found that analysts were more inclined to cover the following types of firms:

(i) large firms. These typically have the largest number of shareholders and analyst reports are most useful to existing shareholders, since they can react to negative reports by selling part of their holding, as well as to positive reports by buying more shares. Since “sell-side” analysts, who work for brokerage firms, are rewarded by the trading commissions they generate they have an

\textsuperscript{14} “When it Comes to IR, the Rich get Richer”, Investor Relations Business, January 4, 1999, 1-14.


obvious incentive to concentrate their efforts on firms with many shareholders.

(ii) firms with *few lines of business*. Such firms tend to be more transparent and easier for
the analyst to understand, so that the cost of analysis is lower.

(iii) firms with *low insider holdings* and *large institutional holdings*. Insiders are unlikely
to be significant users of analyst information, but institutions often require documented analyses
to justify their portfolio decisions.

Finally, Bhushan found that, in order of preference, analysts prefer to follow firms in the
following industries: mining, utilities, financial institutions, services, construction and
manufacturing, wholesale and retail trade. The first three of these industries are ones in which the
analyst’s expertise is likely to be of most value: for mining firms the volatility in the price of a
single homogeneous output can be easily translated into information about earnings; for both
utilities and financial services, regulation dictates that a plethora of information be available to
assist the analyst in transforming information about input and output prices and demand growth
into information about earnings. By comparison, firms in services and manufacturing are typically
much less transparent, so that the analyst’s primary task of forecasting earnings is correspondingly
more difficult. Bushan’s investigation confirms what we might expect, that analyst decisions about
which firms to follow are governed in large part by a simple cost-benefit calculus.

The ability of this simple cost-benefit model to explain analyst decisions suggests that
investor relations activities that reduce the cost of information to analysts would also stimulate
analyst coverage, and such indeed seems to be the case. While there is perhaps only limited
credibility in a National Investor Relations Institute study that finds that the number of analysts
following a company is influenced by investor relations activities, these findings are confirmed by
a number of independent academic studies.

Francis et al.\textsuperscript{17} have studied the reactions of investment analysts to firms’ presentations to the prestigious New York Society of Financial Analysts. These presentations give firms an opportunity to "tell their story" to the analyst community. The authors find a significant increase in the number of analysts who are active in forecasting the earnings of firms that have made such presentations: while the increase in the number of analysts is only 9\% for large firms whose many shareholders who create a large demand for analyst coverage, the increase in the number of active analysts is an impressive 21\% for small firms for which the costs and benefits of investment analysis are likely to be more finely balanced.

Lang and Lundholm\textsuperscript{18} report that the higher is the quality of the information provided to analysts by a firm, as measured by the Financial Analysts Federation Corporate Information Committee, the more accurate are analysts’ earnings forecasts for the firm, the greater is the agreement between the forecasts of different analysts, and the greater is the number of analysts following the firm. The improved accuracy is consistent with the improvement in disclosure; and the greater agreement among analysts is consistent with their greater reliance on the common body of information that is disclosed by the firm; finally, the greater analyst following is consistent with the cost of information to the analysts being reduced by the firm’s disclosure. Table 1 reveals


the strong relation between both firm size and the Financial Analysts’ scores for “Other Publications” (i.e. not the annual report) and for “Investor Relations” and the number of analysts following the firm\(^{19}\). The Investor Relations score is based on perceived responsiveness to analyst questions, accessibility and candor of management, as well as the frequency and content of presentations to analysts.

There is also anecdotal evidence that analysts prefer to follow firms that provide them with adequate and timely information. One analyst\(^{20}\) is quoted as saying:

> “I don’t follow Pullman because they won’t tell you enough about their business to allow you to get a handle on it. If they change and become more open with the Street, there is no doubt I’d take more interest in Pullman.”

Another analyst\(^{21}\) calls his relationships with the investor relations officer and senior executives “essential and critical”:

> “I want to know if there is anything new when I call... I expect a call when there is something new, good or bad... realistically I can give few second chances, so give us signals. Hell has no fury like an analyst surprised”.

The preferences of analysts for firms that provide extensive information about themselves

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\(^{19}\) The lack of significance of the “Annual Report” score is most likely attributable to multi-collinearity between the different scores.


\(^{21}\) Dan LeMaitre, who has been rated number one by *Institutional Investor Magazine*, quoted in *IRUpdate*, National Investor Relations Institute, February 1997.
is paralleled by that of the institutional investors who are analysts’ primary clients. Falkenstein finds that mutual funds tend to invest more in companies that are in the news, as well as older companies with more established track records. Similarly, foreign investors own 11.9% of the firms in the largest size decile in Korea, but only 3.2% of the firms in the smallest decile. Information is more available about the larger firms so that foreigners are less likely to be at an informational disadvantage in trading these firms; not coincidentally, the markets in these firms’ stocks are more liquid. The foreigners’ share of trading is only 40% of their share of the holdings for the smallest decile firms, but 108% for the largest decile firms.

In summary, it appears that activities that reduce the cost of information to analysts lead to a greater analyst following, more agreement among analysts and greater accuracy of analyst forecasts. As we shall see in the next section, such analyst activity is associated with greater liquidity in a firm’s shares. In the following section we shall document the association between liquidity and cost of capital or share price.

II

Analysts, Information and Liquidity

We have seen that a firm can influence the number of analysts who follow it by its disclosure and investor relations activities. Before looking at the evidence on the effect of the number of analysts following a firm on the liquidity of trading in a firm’s shares, we must consider carefully what we mean by liquidity.

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Liquidity is a slippery concept. We might try defining it as the ability to buy or sell an asset at short notice without granting a price concession. This would be consistent with the notion that specialized physical assets such as houses are relatively illiquid; airliners are somewhat less liquid, and Treasury Bills are highly liquid. However, there are two things wrong with this simple definition of liquidity. We have not defined “short notice”, and we have not said how much of the asset we are buying or selling - the latter is important for stock market investments for which there is no natural trade size as there is for houses. If we define “short notice” as meaning “no notice” then, for a given trade size, an asset’s illiquidity is measured by the price concession that is necessary to buy or sell it immediately. This suggests using the asset’s quoted bid-ask spread as a measure of illiquidity, and some researchers have used the quoted bid-ask spread as a measure of illiquidity. However, many of the transactions on the New York Stock Exchange for example do not take place at the quoted spread. For some transactions, there is price improvement as floor traders step up to beat the specialist’s quote, and for other, larger, transactions the transaction price lies outside the quoted spread, which therefore understates the price concession required to execute a trade. Indeed, the stock exchange specialists who report the bid and ask prices that constitute the spread frequently fail to report limit orders that would better the quoted spread. As a result, the effective spread that is paid by retail investors averages only 52-63% of the quoted spread and the correlation between effective and quoted spreads is only around 0.10\(^2\). Therefore, since the pioneering work of Kyle\(^2\), it has become common to measure the illiquidity of the


market in a firm’s shares by the marginal price impact of a trade; this corresponds to the slope of
the regression line relating the price change to the trade size which is known as the Kyle \( \lambda \):

\[
\text{Price Change} = \pm \Delta + \lambda \text{ number of shares traded}
\]  \hspace{1cm} (1)

In this equation \( \Delta \), the fixed component of the price change, depends only whether the
order is a buy or a sell, while \( \lambda \) \((\text{lambda})\) measures the price impact per share of the trade.
Equation (1) is illustrated in Figure 1 for a liquid and an illiquid stock. The illiquid stock is the one
with the steeper price impact line, implying that the price concession for a given size trade is
larger than for the liquid stock.

Kyle showed that the illiquidity of a stock depended on the degree of \textit{asymmetry of
information} about the intrinsic value of the stock. Informational asymmetry is said to exist if some
investors enjoy an informational advantage over others; for example, an investor who has a better
forecast of a forthcoming earnings announcement will have an informational advantage over other
investors until the earnings are announced, and may attempt to use this information to trade
profitably. Under conditions of informational asymmetry, a buyer who places an order is
immediately suspected of having superior information about the stock and knowing that it is
currently underpriced. As a result, his order reveals information to the market, which causes the
market price to adjust against him. Similarly for a sell order. If there were an informational level
playing field, we should not expect there to be any information in a buy or sell order and the price
concession would be limited to \( \pm \Delta \), which is the amount needed to compensate the market maker
for his costs.
Figure 2, which is derived from a study by Brennan and Subrahmanyam\textsuperscript{25}, shows the estimated price impact in cents per share for a 100 share trade where the companies are grouped into 25 different groups, first by size of firm and then by the estimated Kyle \( \lambda \). This measure of informational price impact can range from much less than 1 cent per share to over 30 cents a share for a 100 share trade. Clearly some shares are much more liquid than others and, as we should expect, smaller firms (S5) are much less liquid than large firms (S1). Since the number of shares traded will depend on the price per share, it is convenient to define the “dollar lambda”, $\& \lambda$, as the Kyle lambda divided by the share price:

\[
\& \lambda = \frac{\lambda}{P}
\]

\( \& \lambda \) measures the price impact per dollar of transaction size. We should expect the $\& \lambda$ to be zero if there is an informational level playing field. We might expect that investment analysts would help to level the playing field by making their company analyses available to a broader circle of investors. To test this, we regressed the logarithm of the dollar lambda on the logarithm of \((1 + \text{the number of investment analysts following the firm})\) and some other variables for a sample of 1421 NYSE stocks in 1988: the results are reported in Table 2a. As we expected, there is a strong negative relation between the number of analysts following the firm and the dollar lambda; analysts do indeed increase a stock’s liquidity. We are not surprised to find that an even

more important variable is the share trading volume: stocks with heavier trading volume are more liquid. Finally, stocks that are riskier as measured by the variance of the daily market return are less liquid, and (probably reflecting the fact that low price shares tend to be more risky also), low price stocks are less liquid.

So far we have seen that analysts increase liquidity directly, but the most important determinant of liquidity is trading volume. Is it possible that analysts also increase trading volume? Some suggestion that this must be so is implicit in the fact that the services of most analysts are not paid for directly, but indirectly in the form of trading commissions. Table 2b confirms that the number of analysts following a stock has a major impact on trading volume; the other determinants being the market value of the firm, and the share price (high price firms trade fewer shares). Table 2c puts together the direct and indirect effects of analyst following on the dollar lambda, using the parameter estimates from Tables 2a and 2b. We see that six analysts can reduce the dollar lambda by about 28%, holding volume constant; but when the indirect effect through volume is taken into account the reduction in trading costs rises to around 85%; the volume effect turns out to be the most important. If these changes in trading costs seem very large, it is worth bearing in mind that a simple rule change on NASDAQ reduced the quoted spreads of the average stock by 33%, and of the least liquid stocks by 43%\(^{26}\), similarly, Amihud, Mendelson and Uno\(^{27}\) report that a simple reduction in the minimum trade size of a stock listed on the Tokyo Stock


Exchange increases their measure of its liquidity by 36%.

The finding that analysts improve stock liquidity is consistent with their role as disseminators of information, whose reports reduce the asymmetry of information between investors about the future earnings of the firm. Further evidence on the effectiveness of analysts in speeding the dissemination of information about firms is available from three studies. First, Dempsey28 shows that the more analysts who follow a firm the less likely is the market to be surprised by the firm's quarterly earnings announcement. This means that when more analysts follow a firm there is less potential for profitable informed trading ahead of earnings announcements: in other words, the more level is the informational playing field. Secondly, Brennan et al.29 show that stock prices of firms adjust more quickly to macro-economic news the greater the number of analysts following the firm. Similarly, Hong et al.30 report that stock prices adjust to bad firm specific information much more slowly when there are few analysts following the firm. These studies also imply that there is less scope for profitable informed trading when there are more analysts following the firm. Since (i)liquidity is primarily a function of asymmetric information, these studies provide further evidence of the role of analysts in improving liquidity, and support the case for a causal link between investor relations activities and liquidity. Weaker,


though more direct evidence of this link is provided by Welker\textsuperscript{31} who shows that there is a negative relation between the quality of a firm's disclosure as assessed by the Financial Analysts Federation and the bid-ask spread, after controlling for other variables that affect the spread. We turn next to consider the link between liquidity and a firm's cost of capital and stock price.

III

Liquidity, Disclosure and the Cost of Capital

The most direct evidence that liquidity can affect stock prices comes in simple study by Amihud, Mendelson and Lauterbach\textsuperscript{32}. These authors examined what happened to the prices of 120 stocks whose trading was switched by the Tel Aviv Stock Exchange in Israel from a once a day "call auction" to "continuous trading" in which there are a series of sequential trading sessions through the day in which bilateral trades take place in a trading pit similar to that on North American futures markets. These trading switches took place during the period 1987 to 1994. The details of the continuous trading mechanism need not detain us. What is important is that there was an increase in the liquidity of the stocks selected for trading in this way, whether measured in terms of trading volume relative to total market trading volume - trading volume in selected stocks as a proportion of total market volume rose by 0.492\% (t-stat = 7.27) - or in terms of the volume associated with a 1\% change in stock price - this rose by 0.87 (t-stat =


10.90). The increase in liquidity that was caused by this minor technical change in trading protocols was associated with an average 5.5% increase in stock prices, as shown in Figure 3. Moreover, the authors point out that it is likely that this underestimates the true effect of the increase in liquidity on stock prices since the market was likely to anticipate which stocks would eventually be selected for continuous trading. When the exchange announced in 1991 that it was building new capacity that would allow continuous trading in another 40 stocks, 8 stocks were identified by the press as likely candidates and were selected by the exchange for continuous trading two months later. The total abnormal price change in these stocks from the newspaper story day to the day after they were selected was 12.25%, which is probably estimate of the effect of the improved liquidity on the stock price. In short, this study can leave little doubt about the fact that increases in liquidity reduce investor’s required rates of return and so increase stock prices. Most other studies have examined the association between risk adjusted required rates of return and various measures of (il)liquidity. They have all found results that are consistent with this study; the greater is a stock’s measured illiquidity, the higher is the market’s required rate of return.

Amihud and Mendelson33 (1986) measured illiquidity by the quoted bid-ask spread expressed as a proportion of the stock price. First they formed 49 portfolios of NYSE stocks for each of the eleven years 1961-1980 based on the estimated betas and relative bid-ask spread variable. When they did a simple ordinary least squares regression of monthly portfolio returns on beta, spread and a dummy variable for each year they found that the coefficient of the spread

variable was 0.211 (t = 6.83); this implies that a 1% increase in the spread was associated with an increase in the expected return of 0.211% per month or 2.53% per year. The proportional spreads of their portfolios ranged from 0.49% to 3.21%; this difference in spreads translates into a difference in expected returns of 6.89% per year.

To put this return difference into perspective, consider a stock that falls into the most liquid category, pays a dividend of $1 per year which is expected to grow at 5% per year and has a required return of 10%; standard calculations imply that the stock price would be 1/(0.10-0.05) = $20. Now suppose instead that it fell into the least liquid category, so that its required return was 0.10 + 0.0689 = 16.89% per year; the stock price would be only 1/(0.1689 - 0.05) = $8.41!

These results have been confirmed in a more recent study by Brennan and Subrahmanyam\(^4\). They form twenty-five portfolios of New York Stock Exchange firms each year from 1984 to 1991 classified by size and the Kyle \(\lambda\) measure of (il)liquidity, and use the Fama-French three factor model to calculate risk-adjusted returns on the portfolios. The Fama-French model adjusts not only for market risk but also for the effects of firm size and the value bias that is apparent in historical returns. Figure 4 plots the annualized risk-adjusted returns for the five lambda categories\(^5\). The estimated required returns or costs of capital are uniformly increasing as we move from the most liquid to the least liquid quintile, and the difference between the most and least liquid quintile is a striking 662 basis points per year. These results confirm that


\(^5\) See Brennan and Subrahmanyam (1996) Table 4. The risk-adjusted return on the most liquid portfolio is zero by construction.
liquidity is a major determinant of a firm's cost of capital and therefore the firm's share price.

The studies we have quoted establish a clear chain of causation between the following:

i.) investor relations activities that reduce the cost of information to analysts and the number of analysts who follow the firm and the quality of their forecasts;

ii) the number of analysts who follow the firm and the liquidity of trading in the firm's shares;

iii) the liquidity of trading in the firm's shares and the market's required return and therefore the share price.

This chain implies that investor relations activities that reduce the cost of information to analysts will have a positive effect on the price of a firm's shares. A recent study by Botosan\textsuperscript{36} offers more direct evidence of the link between a firm's investor relations activities and its stock price. Botosan examines the relation between the \textit{ex-ante} cost of equity capital and level of financial disclosure for 122 firms in the metals and machinery industries in 1991. The cost of equity capital is estimated by combining the current stock price with Value Line forecasts of future earnings and dividends to arrive at the expected long run return on each stock\textsuperscript{37}. The disclosure score is a subjective measure of how much discretionary information each firm discloses in its annual report. Botosan relies on the fact that firms that disclose more information in their annual report generally rank highly on other measures of information disclosure and

\textsuperscript{36} Christine Botosan, 1997, Disclosure Level and the Cost of Equity Capital, \textit{Accounting Review 72}, 323-350.

\textsuperscript{37} Botosan uses the Edwards-Bell-Ohlson formula which uses information about payout ratios, returns on equity and book values to forecast future returns.
investor relations. The expected return is regressed on the firm’s beta, its market value and its

**Disclosure Quality Rank**, a ranking from 1 to 10 which is constructed from the disclosure score:

\[
\text{Cost of Equity} = a_0 + a_1 \text{Beta} + a_2 \text{Disclosure Quality Rank} + a_3 \text{Firm Value}
\]

The results, which are reported in Table 3 show that, as the CAPM predicts, the cost of equity is increasing in the firm’s beta; it is also slightly decreasing in the firm’s size as measured by the market value of its equity. The effect of disclosure quality on the firm’s cost of equity depends on whether or not the firm is followed by many analysts. For firms that are followed by many analysts (more than the median number), disclosure quality appears to have no effect on the cost of equity. But for firms that are followed by fewer than the median number of analysts, improved disclosure quality significantly reduces the firm’s cost of equity capital. Botosan concludes from these results that “among the firms with low analyst following, the most forthcoming firm enjoys about a 9.7% reduction in its cost of equity capital relative to the least forthcoming firm. We suspect that, if anything, Botosan underestimates the effects of disclosure by ignoring the effect of disclosure on the number of analysts who follow the firm. Nevertheless, Botosan’s study is important is providing direct corroborative evidence of our thesis that investor relations activities that reduce the cost of information acquisition for analysts reduce a firm’s cost of capital and

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"In its 1990 annual report, Walbro provided a discussion of the potential impact of anticipated risk and existing opportunities facing the firm, provided directional predictions of future profits and sales, and gave a point estimate forecast of capital expenditures...by providing this information Walbro Corporation reduced its cost of equity capital by approximately 3.4% relative to a firm with a low analyst following that provided no forecast information.” *Botosan, 1997*
its stock price\textsuperscript{38}.

IV

Conclusion

In this paper we have established the importance of a firm’s investor relations activities for its stock price. The link between investor relations activities and the stock price is an indirect one. First, we established that investor relations activities, in the form of high levels of disclosure and presentations to investment analysts, increase the number of investment analysts who follow the firm and publish earnings forecasts for the firm by reducing the analysts’ cost of information; moreover, these activities tend to improve the accuracy of analyst forecasts and the degree of agreement across analysts. Secondly, we showed that the number of analysts who follow a firm has a positive effect on the liquidity of trading in the firm’s shares by reducing informational asymmetry. Finally, we showed that there is good evidence that, as one would expect, the market’s required rate of return on a stock depends on the liquidity of the market for the stock. Hence, a firm may be able to reduce its cost of capital and increase its stock price by investor relations activities that reduce the cost of information to the market and to investment analysts in particular. This is not the only function of investor relations activities however. We have argued that by presenting a coherent description of a firm’s opportunities and strategies, an investor

\textsuperscript{38} There is also evidence suggesting that firms whose Financial Analysts’ Federation disclosure score is high enjoy a lower cost of debt as well. See Partha Sengupta, 1998, Corporate Disclosure Quality and the Cost of Debt, \textit{The Accounting Review}, 73: 459-474.
relations program may enhance the credibility of a firm’s management, and that this may be particularly valuable when that credibility is called into question by another management group in the course of a takeover attempt.
Number of Analysts Following Firm =

\[ 0.17 \]
\[ (6.20) \]

Plus

0.02 FAF Annual Report Score
\[ (0.80) \]

Plus

0.07 FAF Other Publications Score
\[ (2.30) \]

Plus

0.10 FAF Investor Relations Score
\[ (3.50) \]

Plus

0.59 Firm Market Value
\[ (23.0) \]

Minus

0.05 Sigma (ROE)
\[ (1.80) \]

Minus

0.06 Return-Earnings Correlation
\[ (2.70) \]

\[ N = 998 \quad R^2 = 45\% \quad \text{t-statistics in parentheses} \]

Determinants of Analyst Coverage
(Lang and Lundholm, 1996)

Table 1

The FAF scores are developed by the Financial Analysts Federation and are based on the assessments of
committee’s of analysts on the firm’s disclosure performance in their Annual Statements, Other Publications, and
general Investor Relations. The data relate to the fiscal years 1985-89.
\[ \ln(\lambda/\text{Price}) = \]

<table>
<thead>
<tr>
<th>Term</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.30</td>
<td>(5.51)</td>
</tr>
<tr>
<td>minus</td>
<td>0.169 \log(1 + # ANALYSTS)</td>
<td>(3.13)</td>
</tr>
<tr>
<td>minus</td>
<td>0.888 \log(\text{average trading volume in shares})</td>
<td>(26.05)</td>
</tr>
<tr>
<td>plus</td>
<td>0.275 \log(\text{average daily price})</td>
<td>(6.42)</td>
</tr>
<tr>
<td>plus</td>
<td>0.638 \log(\text{daily return variance})</td>
<td>(18.40)</td>
</tr>
</tbody>
</table>

\[ N = 1441 \quad R^2 = 75\% \quad (t\text{-statistics in parentheses}) \]

a) Investment Analysts reduce the cost of trading directly

\[ \log(\text{average trading volume}) = \]

<table>
<thead>
<tr>
<th>Term</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.133</td>
<td>(9.64)</td>
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<tr>
<td>plus</td>
<td>0.897 \log(1 + # ANALYSTS)</td>
<td>(13.31)</td>
</tr>
<tr>
<td>minus</td>
<td>0.907 \log(\text{average daily price})</td>
<td>(15.80)</td>
</tr>
<tr>
<td>plus</td>
<td>0.615 \log(\text{market value})</td>
<td>(12.49)</td>
</tr>
</tbody>
</table>

\[ N = 1441 \quad R^2 = 68\% \quad (t\text{-statistics in parentheses}) \]

b) Analysts also create trading volume
<table>
<thead>
<tr>
<th>Number of Analysts</th>
<th>( \lambda/\text{Price} ) (Holding trading volume constant)</th>
<th>Trading volume</th>
<th>( \lambda/\text{Price} ) (Allowing for change in trading volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>89</td>
<td>186</td>
<td>51</td>
</tr>
<tr>
<td>2</td>
<td>83</td>
<td>268</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>79</td>
<td>347</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>76</td>
<td>424</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>74</td>
<td>499</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>72</td>
<td>573</td>
<td>15</td>
</tr>
</tbody>
</table>

c) Estimated total effect of analyst following on trading costs

Trading Costs and Analyst Coverage

Table 2

The table shows the relation between trading costs as measured by the scaled Kyle lambda (\( \lambda/\text{Price} \)) and the number of analysts following the stock after taking account of the effect of the number of analysts on trading volume. The data on the number of analysts is for the year end 1987. Other data relate to the year 1988. The sample consists of 1,421 stocks listed on the NYSE.
The Effect of Disclosure Quality on Expected Returns for Firms with High and Low Analyst Following (Botosan, 1997)

Table 3

DQR is the firm’s Disclosure Quality Rank. Firms are assigned to the High/Low analyst group according to their analyst coverage relative to that of the median firm. The data relate to 1990-1991. Original dummy variable regression has been restated as separate regressions for clarity.
The Kyle lambda

Figure 1

Illiquidity or trading cost is measured by the slope of the line
Price Impact and Firm Size

Figure 2

The figure shows the estimated price impact in cents per share for a 100 share trade for NYSE securities grouped by firm size and price impact category. Average values for 1984-1991. (Brennan and Subrahmanyam, 1996)
Abnormal Returns around Announcement Date (A) of Change in Trading Protocol

Figure 3

The graph shows the cumulative abnormal returns of 120 stocks whose trading was switched from a once a day call auction to continuous trading on the Tel Aviv Stock Exchange during 1987-1994. Source: Amihud, Mendelson, and Lauterbach (1997)
Risk Adjusted Excess Returns and Illiquidity
NYSE 1984-1991

Figure 4

The chart show the risk-adjusted excess returns associated with five different values of the Kyle \( \lambda \) estimated from the returns on 25 size and \( \lambda \) sorted portfolios of NYSE stocks during the period 1984-1991.