Morgan Stanley

Journal of Applied Corporate Finance

Investor Base, Cost of Capital, and New Listings on the NYSE

by Gregory B. Kadlec,
Virginia Polytechnic Institute, and
John J. McConnell,
Purdue University

INVESTOR BASE,
COST OF CAPITAL,
AND NEW LISTINGS
ON THE NYSE

by Gregory B. Kadlec,
Virginia Polytechnic Institute, and
John J. McConnell,
Purdue University

C orporate managers often justify certain fairly common corporate practices by describing them as attempts to enlarge their company's investor base. These practices include stock splits, the hiring of shareholder relations officers, meetings with security analysts, the issuance of ADRs, and the listing of their company's shares on major domestic and international stock exchanges. Consider, for example, the news report announcing the decision by Coastal Healthcare to have its shares listed on the New York Stock Exchange:

> *Coastal Healthcare said the listing will "enhance the liquidity of our shares, allow us to diversify our shareholder base, broaden our recognition with the investment community and further enhance shareholder value." (Wall Street Journal, 11/29/94);*

or this report that accompanied Microsoft's 2-for-1 stock split:

> *Jon Shirley, Microsoft's president and chief operating officer, said the split "reflects the company's desire to make our stock more accessible to a broader base of investors." (Wall Street Journal, 8/4/87);*

or this report that accompanied the initiation of Sandoz Ltd.'s ADR program:

> *Sandoz Ltd. of Basle, Switzerland, established a sponsored American depositary receipt program to broaden its international shareholder base. (Dow Jones News Wire, 11/07/91).*

The notion that investor base has an effect on share value has intuitive appeal and is strongly supported by "streetlore." But standard finance theory, as represented by the familiar Capital Asset Pricing Model (CAPM) or its recent challenger, the Arbitrage Pricing Theory (APT), does not attribute any particular role to the size of investor base as a determinant of share values. Indeed, from the perspective of traditional finance theory, each of the corporate actions cited above is viewed as value neutral. Yet empirical research suggests that certain of these corporate practices are associated, at least on average, with an increase in share values. While various explanations have been offered for these increases in share value, the role of investor base has been largely unexplored.

In this article, we report the results of our recent study of 273 companies that during the 1980s decided to switch the trading locale of their shares from the over-the-counter (OTC) or NASDAQ market to the NYSE.[1] We found that share prices increased by about 6%, on average, at the time the stocks became listed on the NYSE, and that the investor base of these firms increased by almost 20%. We also found that the average stock experienced a reduction in bid/ask spread of about 5% after listing. In an analysis of the relation among share prices, investor base, and bid/ask spread, we found that the stock price increase was significantly correlated with both the percentage increase in investor base and the reduction in bid/ask spread.

In short, our analysis supports the popular idea that an expanded shareholder base can increase a firm's stock price.

---

1. For a fuller discussion of this study see Gregory B. Kadlec and John J. McConnell, "The Effect of Market Segmentation and Illiquidity on Asset Prices: Evidence from Exchange Listings," *Journal of Finance* XLIX (June 1994): 611-636.

NEW LISTINGS ON THE NYSE
DURING THE 1980s

We are not, of course, the first to study the effect of an NYSE listing on share price. That honor appears to belong to a study published in the *Journal of Business* in 1937.[2] Like most research on listings that came after it, this early study came to the conclusion that a new listing on the NYSE is associated with an increase in stock price.[3] Financial theorists have tended to attribute this increase in value to the increase in "liquidity" that is said to accompany stocks that switch to the NYSE. Typical of this thinking is a 1986 study (involving one of the present authors)[4] which argues that the differences in the market structure and means of transacting between the NYSE and the OTC market could lead to a lower cost of transacting and, therefore, greater liquidity. The greater liquidity, in turn, leads to a higher stock price.

We conducted our analysis on a sample of 273 NASDAQ stocks that became newly-listed on the NYSE during the period August 1980 through December 1989. This sample includes all stocks that listed over this period (except those that listed during October 1987) for which sufficient data were available to conduct the study. The sample covers a wide range of industries, with firms representing 50 of the 83 possible two-digit Standard Industrial Classification (SIC) codes. Of the 273 companies, 188 are industrials, 77 are financials, and 8 are utilities.

As shown in panel A of Table 1, the new listings were spread reasonably evenly throughout the decade. As shown in panel B, the sample is balanced between firms with a relatively long history of trading in the OTC/NASDAQ market and those with a short history of OTC/NASDAQ trading. For example, 26% of the sample firms had traded in the OTC/NASDAQ market for more than ten years, while 31% had traded in the OTC/NASDAQ market for three years or less. Finally, as shown in panel C, the sample is not dominated by stocks with either very low or very high prices. The median price of the stocks just prior to listing was $19 5/8.

To determine whether listing on the NYSE during the 1980s was accompanied by an increase in stock price, we calculated each stock's rate of return (after adjusting for overall market movements) from the week that the company first announced that the stock would change its trading locale until the week the stock actually began to trade on the NYSE. This interval averages four weeks, with a maximum of 22 weeks and a minimum of one week. Of the stocks in the sample, 69% earned a positive market-adjusted return over this interval and the average market-adjusted return was 5.8%. On an annualized basis, this amounts to an "excess" return of almost 70%.

Clearly, during the 1980s, listing on the NYSE was accompanied by a boost in shareholder wealth.

Changes in Investor Base

The next question we explored is whether the switch in trading from the OTC/NASDAQ system to the NYSE is accompanied by an increase in investor base. The answer to that question is yes. Based upon data taken from the NYSE listing application and corporate 10-Ks, 63% of the stocks in the sample experienced an increase in the number of registered shareholders after listing, and the typical stock saw a 19% increase in the number of registered shareholders. These numbers can be compared with the findings of a another recent study—one which reports an average increase of only 3% per year in the number of registered shareholders for NASDAQ stocks that were eligible to list on the NYSE but did not elect to do so.[5]

Additionally, based on data taken from *Standard and Poor's Stock Guide*, 69% of the stocks experienced an increase in the number of *institutional* investors after listing. The typical firm had 49 institutional shareholders prior to listing and experienced a 27% increase in this number.

Changes in Bid/Ask Spreads

We also collected data on bid/ask spreads before and after listing. The average bid/ask spread

2. See M. G. Ule, "Price Movements of Newly-Listed Common Stocks," *Journal of Business* 10 (1937): 346-369.

3. These other studies include A. Merjos, "Going on the Big Board: Stocks Act Better Before Listing Than Right Afterward," *Barron's* (1962): 43, Waldemar M. Goulet, "Price Changes, Managerial Actions and Insider Trading at the Time of Listing," *Financial Management* 3 (1974): 30-36, L. Ying, W. Lewellen, G. Schlarbaum, and R. Lease, "Stock Exchange Listing and Security Returns," *Journal of Financial and Quantitative Analysis* 12 (1977): 415-432, and Gary C. Sanger and

John J. McConnell, "Stock Exchange Listing, Firm Value and Security Market Efficiency: The Impact of the NASDAQ," *Journal of Financial and Quantitative Analysis* 21 (1986): 1-25.

4. Sanger and McConnell (1986).

5. Arnold R. Cowan, Richard B. Carter, Frederick H. Dark, and Ajai K. Singh, "Explaining the NYSE Listing Choices of NASDAQ Firms," *Financial Management* 21 (Winter 1992): 73-86.

TABLE 1
DESCRIPTIVE STATISTICS OF 273 NASDAQ STOCKS THAT LISTED ON THE NYSE OVER THE PERIOD 1980-1989

PANEL A: Frequency Distribution by Year of NYSE Listings

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Total
Firms	13	30	27	18	22	22	30	29	50	32	273
Percent of Total	4.8	11.0	9.9	6.6	8.1	8.1	11.0	10.6	18.3	11.7	100%

PANEL B: Frequency Distribution by Number of Years Traded in OTC Market Prior to Listing

Year	< 1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	> 10	Total
Firms	15	34	36	25	15	11	11	8	23	25	70	273
Percent of Total	5.5	12.5	13.3	9.2	5.5	4.1	4.1	3.0	8.5	9.2	25.6	100%

PANEL C: Market Value and Price Per Share of Common Stock at the Time of Listing

	Mean	Median	Minimum	Maximum
Market Value of Equity (in millions)	$348	$181	$20	$6055
Shares Outstanding (in millions)	13.8	9.2	1.4	108.9
Share Price	$37.42	$19.63	$3.00	$4325

before listing was $0.351, and 60% of the stocks experienced a decline in spread after listing. For the typical stock in the sample, the bid/ask spread declined by 5%.[6] We were interested in bid/ask spreads because, as noted, earlier research has attributed the increase in stock price associated with a new listing to an increase in market liquidity, and bid/ask spread is often used as a proxy for liquidity.

Of course, investor base and market liquidity do not necessarily have *independent* effects on stock prices. A stock with a large investor base is also likely be highly liquid and vice versa; thus, it is not clear which factor leads the other. In our statistical analysis, we included both variables to hold constant the effect of one while analyzing the effect of the other.

TOWARD A NEW VERSION OF THE CAPM

As we noted, traditional finance theory does not attribute any particular role to investor base as a determinant of share values. But, in his 1987 Presidential Address to the American Finance Association, Robert Merton proposed a theory of asset pricing based on the premise that investors invest in only a subset of all available securities.[7] To support his premise, he posits that investors—perhaps because it is costly to gather and assimilate information—have limited ability to be aware of the almost limitless set of available securities. He also observes that some institutional investors are restricted in the types of securities in which they can invest.

The net result of Merton's analysis is a model of asset pricing in which investor base plays a prominent role. In particular, the Merton model extends and supplements the traditional Capital Asset Pricing Model (CAPM) model of security pricing by including a second risk factor (the first, of course, is beta) that depends upon the size of a stock's investor base. The smaller the investor base, the higher this risk factor and thus the higher the stock's required rate of return. Or, to put it differently, in Merton's version of the CAPM, actions that management takes to increase the firm's investor base can reduce the firm's cost of capital and so increase its share price.

From our perspective, Merton's model accomplishes two things. First, it provides a theoretical justification for corporate management's concern with investor base. Second, the model provides the conceptual framework in which we conducted our statistical analysis of the effect of investor base on stock price when shares become listed on the NYSE.

6. These results are in line with those of Robert C. Klemkosky and Robert M. Conroy, "Competition and the Cost of Liquidity to Investors," *Journal of Economics and Business* 37 (1985): 183-195; and William Christie and Roger Huang "Dissimilar Market Structures and Market Liquidity: A Transactions Data Study of Exchange Listings," Vanderbilt Working Paper," 1994.

7. Robert C. Merton, "Presidential Address: A Simple Model of Capital Market Equilibrium with Incomplete Information," *Journal of Finance* 42 (1987): 483-510.

How the Model Works. A numerical example using Merton's model together with data from our sample of new listings can give some insight into the potential effect of investor base on share price. In Merton's model, the expected return on a security can be expressed as follows:

$$E(R_k) = R_f + B_k[E(R_M) - R_f] + I_k - B_k I_M.$$

The first set of terms, $R_f + B_k[E(R_M - R_f]$, represents the expected return according to the familiar CAPM. The new term, $I_k - B_k I_M$, is an additional risk premium that reflects investors' compensation for investing in companies with a smaller investor base. The investor base risk premium has two components: a firm-specific component, I_k, which reflects the degree to which a specific firm's investor base is less than "complete"; and a market-wide component, $B_k I_M$, which reflects the degree to which the average firm's investor base is less than complete.

Because a change in a firm's investor base affects only the firm-specific investor base premium, I_k, the change in expected return brought about by a change in investor base is equal to the change in I_k. (The other terms in the equation drop out.) In more detailed terms, the firm-specific investor base risk premium is given by:

$$I_k = (AS^2_k M_k (1 - Q_k))/Q_k$$

where Q_k is the number of security k's investors relative to the total number of possible investors, S^2_k is the firm-specific (or non-beta) risk of security k, M_k is the market value of firm k relative to the market value of all traded securities, and A is a measure of the aggregate risk aversion of all investors.

According to the model, then, a change in the cost of capital brought about by a change in investor base is equal to the change in I_k. Therefore, to determine whether a 19% increase in shareholder base can explain a 6% increase in stock price, we have to assign values to the various components of I_k. Because the annual non-beta risk for a typical stock is about 8%, we begin by assuming that S^2_k = .08. The average market value of equity for the firms in our sample was $290 million, and the market value

of all stocks traded on the NYSE, AMEX, and the OTC market at the time was approximately $3.5 trillion[8] (thus making M_k = 290/3,500,000, or .00008). Suppose that a firm had 10,000 shareholders before listing and there are approximately 40 million shareholders in total (making Q_k = 10,000/40,000,000, or .00025). Finally, empirical studies of aggregate risk aversion suggest that A = 2 is a reasonable estimate.[9]

Putting each of the above values into equation (1), we estimate the average I_k of the firms in our sample to be 0.053 *prior to listing*. This can be interpreted as saying that the average firms' cost of capital before listing on the NYSE contained an investor base risk premium of roughly 5.3%.

If we then repeat the same calculations with 12,000 shareholders (which represents a 20% increase from 10,000), the firm's post-listing I_k falls to 0.044. Thus, the annual expected return on the average stock in our sample is now 0.9% (0.053 – 0.044) lower than it was prior to listing. If we assume that the expected return on the average stock prior to listing was 15%, a reduction of 0.9% in the cost of capital translates into a one-time increase in stock price of 6%.

In short, using Merton's model with reasonable parameters, we can explain our reported 6% increase in share prices solely in terms of the effect of increasing investor base.

A Liquidity Model. As we mentioned at the outset, earlier empirical studies have typically attributed the increases in value that come with new listings to increases in liquidity that supposedly accompany such listings. In a 1986 study, Yakov Amihud and Haim Mendelson developed a theoretical model of asset pricing and liquidity as measured by bid/ask spread.[10] In their model, a stock's expected return declines along its bid/ask spread. Thus, if listing reduces a stock's bid/ask spread, this model predicts an increase in the stock price. The Amihud and Mendelson model provides the theoretical underpinnings for our empirical analysis of the relation between stock prices and bid/ask spread when stocks list on the NYSE.

As we also noted, our first look at the data showed that new listings are associated with an increase in investor base and a decrease in bid/ask

---

8. This estimate of aggregate market value is based on data reported in the NYSE's, AMEX's and NASDAQ's *1990 Fact Book*.

9. For example, Irwin Friend and Marshall Blume, "The Demand for Risky Assets," *American Economics Review* 65, (1975): 900-922 and Rajnish Mehra and

Edward Prescott, "The Equity Premium Puzzle," *Journal of Monetary Economics* 15 (1985): 145-161.

10. Yakov Amihud and Haim Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics* 17 (1986): 223-249.

spread. To determine which, if either, of these factors can explain the increase in stock price that accompanies a new listing, we estimated a multiple regression in which the dependent ("left-hand-side") variable is the stock's market-adjusted return over the listing period and the independent (right-hand-side) variables are the changes in the stock's investor base risk premium and bid/ask spread after listing.

Specifically, the regression equation is:

$$AR_k = a + b_1 \Delta I_k + b_2 \Delta spread_k,$$

where I is the investor-base risk factor from Merton's model and $spread_k$ is an "indicator" variable that is assigned the value of -1 for stocks that experienced a decrease in bid/ask spread, 0 for stocks that experienced no change in bid/ask spread, and $+1$ for stocks that experienced an increase in spread.

Based upon the results of the regression analysis, both of the independent variables are statistically significant. In the parlance of econometrics, both the change in investor base and the change in bid/ask spread help to "explain" the increase in stock price that accompanies a new listing.

IMPLICATIONS FOR CORPORATE MANAGERS

For widely-held stocks, the effect of the investor base factor on expected returns is likely to be modest at best. But, for firms with few shareholders, a small investor base could significantly increase the firm's cost of capital. This suggests that managers of firms with few shareholders have an incentive to take actions that expand their firm's investor base.

We have cited a number of corporate practices designed to expand investor base: stock splits, the hiring of shareholder relations officers, meetings with security analysts, the issuance of ADRs, and the listing of shares on major domestic and international exchanges. Others come to mind. For example, firms that issue equity can choose an underwritten as opposed to a rights offering. In an underwritten offering, the newly issued shares reach new investors, thereby expanding the firm's investor base; whereas in rights offering they do not. Another way in which a firm might expand its investor base is through scheduled press releases that generate media coverage and increases investor recognition of the firm. Or perhaps the initiation of a scheduled dividend policy making the firm eligible to investors prohibited from investing in non-dividend paying stocks may have the effect of increasing investor base. In general, any action that eliminates a constraint on investors' ability to hold the security is likely to increase the investor base. Such constraints may be deliberate, such as "prudent investor" rules that prohibit funds from investing in particular types of stocks, or they may arise unintentionally from information constraints that result in a lack of awareness by investors.

Of course, actions to increase the investor base, like almost all decisions, involve a cost/benefit tradeoff. Whether the benefits of a particular action exceed the costs requires the quantification of each. Merton's model provides a framework within which such decisions can be analyzed. Our empirical analysis gives some indication of the effect of investor base on stock value.

■ GREGORY KADLEC

is Assistant Professor of Finance at the Virginia Polytechnic Institute and State University.

■ JOHN MCCONNELL

is the Emanuel T. Weiler Professor of Management at Purdue University's Krannert School of Management.