Down and Out in the Stock Market:

The Law and Finance of the Delisting Process

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Abstract

Since 1995 more than 7300 firms have delisted from U.S. stock markets, with almost half of these being involuntary. This paper examines the law and finance of the delisting process. We examine economic rationales for delisting, the legal rules that define it, and the causes of delisting. Using a sample of NYSE firms delisted in 2002, we examine the effects of their delisting and subsequent trading on the Pink Sheets. We find huge costs to delisting, with percentage spreads tripling, volatility doubling, but volume remarkably high. We argue that the current delisting process is flawed, and we provide some alternatives.

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I. Introduction

Lost in the turmoil surrounding the stock market's recent rise and fall is an interesting fact: since 1995, more than 7350 firms have delisted from U.S. stock exchanges and markets. Some of these delisted firms left voluntarily for reasons such as mergers, but almost half of all delistings were involuntary, forced upon firms by the very exchanges and markets on which they listed. The practice of delisting stocks that fail to meet certain financial criteria is curious for many reasons: it hurts the firms being delisted; it harms the investors holding those shares; and it removes from the exchange or stock market a security that traders wish to transact. Moreover, the delisting decision is generally left to the discretion of the listing venue, giving stock exchanges and markets a formidable amount of power over firms. Given the far-reaching impact of delisting, an analysis of this economic process seems overdue.

The purpose of this paper is to examine the law and finance of the delisting process. While we believe the delisting phenomenon is interesting and important in its own right, this process also provides a valuable lens through which the competitive behavior of stock markets can be viewed. In earlier work, we have argued that the business of being a stock exchange has evolved dramatically, with the competitive calculus now involving primarily the provision of liquidity.[1] Against this competitive backdrop, we argue that, while delisting weak firms may

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[1] Jonathan Macey & Maureen O'Hara, The Economics of Stock Exchange Listing Fees and Listing Requirements" 11 Journal of Financial Intermediation 297 (2002); Jonathan Macey & Maureen O'Hara, "Globalization, Exchange Governance, and the Future of Exchanges," *in* Brookings Wharton Papers on Financial Services – 1999, (R. Litan and A. Santomero, eds.); Jonathan Macey & Maureen O'Hara, "Regulating Exchanges and Alternative Trading Systems: A Law and Economics Perspective," 28 Journal of Legal Studies 17 (1999); see also, Jonathan Macey and Hideki Kanda, "The Stock Exchange as a Firm: The Emergence of Close Substitutes For the New York and Tokyo Stock Exchanges," 75 Cornell Law Review, 1007 (1990).

have made economic sense a few decades ago, delisting companies whose economic performance has suffered is now much more questionable. We suggest that the costs and benefits of the delisting process are sub-optimally allocated, with the few benefits accruing to the exchanges and the large costs being borne by firms and their investors. Our analysis suggests a substantial re-thinking of the rules and practices of delisting stocks from U.S. equity markets

To develop our analysis, we first consider the economic and legal environment defining the delisting decision. We outline the economic rationales offered for delisting firms, and the various clienteles affected by the delisting decision. We then set out the rules governing delisting on the New York Stock Exchange (NYSE) and the Nasdaq (National Association of Securities Dealers Automated Quotation" Stock Market), and we summarize the procedures used by the NYSE and Nasdaq in delisting actions. Despite the seeming clarity of these rules, we argue that the decision to delist is, in fact, quite arbitrary, with both the NYSE and Nasdaq exercising discretion in the application of their rules. This discretion reflects an ambiguity within the markets themselves regarding the optimality of delisting firms, particularly those with large trading volumes.

We then turn to the economic impact of delisting, and in particular to an analysis of the costs and benefits of delisting. Using a sample of firms delisted from the New York Stock Exchange in 2002, we examine the effects of delisting on the trading of these shares. The sample of firms we analyze is interesting for two reasons. First, for a variety of reasons, most delisted NYSE firms end up trading on the "Pink Sheets", a trading venue little analyzed in the finance literature. We use data provided to us by Pink Sheets, Inc. to examine the subsequent trading of these stocks, thus allowing us to analyze how delisting affects trading volume, spreads, prices and volatility. A second feature of our data is that the delisted NYSE firms in 2002

include a number of very large (and prominent) firms such as Enron, Global Crossing, and USAirways. Our analysis of their subsequent trading in the over the counter market suggests that delisting may have very different effects across large and small firms.

Our research provides a number of contributions, a few of which we emphasize here. First, our analysis quantifies the very real effects that delisting has for the trading of, and the investors in, a stock. Investors clearly face very large costs, with percentage spreads on average tripling when a stock moves to the Pink Sheets. Indeed, the median percentage spread of our sample on the opening day on the Pink Pheets is 25%. Similarly, we find a dramatic increase in volatility between the two venues, with pink sheet volatility more than double compared to the volatility when the stocks traded on the NYSE. While prices continue to decline after delisting, volume remains remarkably high, with average first day trading in our sample of more than 2 million shares. These high volumes suggest that exchanges lose valuable trading opportunities by delisting shares. Our results here add to the limited, but very interesting, literature (see, for example, Sanger and Peterson [1990]; Shumway [1997]) on the economic effects of delisting.

Second, our analysis provides some interesting insights into the trading of non-listed securities. The literature here is particularly limited, with only a very few researchers having looked at OTC trading, and fewer still looking at trading over the Pink Sheets[2]. Our analysis suggests that for, at least some firms, different trading mechanisms entail very different effects on the price process. While small firm trading appears to deteriorate on the Pink Sheets relative to on the NYSE, large firm trading is less affected. Indeed, we find the unexpected result that dollar spreads actually fall for large firms moving to the Pink Sheets. This difference may reflect the fact that liquidity for a firm's shares arises both endogenously (from characteristics of the firm and its equity issue) and exogenously from the trading mechanism. For firms with

[2] An interesting paper looking at the impact of SEC disclosure regulations on OTC firms is Bushee and Luez [2003].

sufficient endogenous liquidity, the form of trading mechanism may primarily influence transactions costs. For some firms, it appears that these costs are actually lower on the electronic Pink Sheets venue than on the NYSE.

Third, our analysis sets out a number of important policy issues relating to the delisting and trading of faltering firms. We argue here that while delisting may be necessary in some cases, its general application is too draconian. We suggest that investors in delisted firms be provided with a "soft-landing" in the form of an efficient alternative trading venue when these firms fail traditional listing requirements. We outline a number of issues and alternatives for exchanges and regulators to consider with regards to the delisting process.

This paper is organized as follows. The next section sets out the economic rationale for delisting, and establishes the reasons why so many firms have been delisted in the past seven years. This section also sets out the legal framework surrounding delisting on both the NYSE and the Nasdaq. Section 3 then investigates the costs of delisting by looking at a sample comprised of the firms delisted from the NYSE in 2002. Our analysis here examines the impact of delisting and moving to the Pink Sheets on spreads, volumes, volatilities, and prices. Section 4 then discusses the implications of our results for the exchange delisting decision, the regulatory treatment of delisting, and alternatives for the trading of faltering stocks.

II. The Law and Economics of Delisting

From an economics perspective, delisting rules can be divided into two analytical categories. In the first category are those rules designed to insure that the exchange's relationship with the listed company remains profitable. It is costly for exchanges to continue to list firms whose trading is sporadic, or where specialists or market makers are unable to retain a

sufficient informational advantage over their "average" counter-party to make the continued quotation of a two-sided market profitable. Because exchanges derive their livelihood from fees associated with trading, it is economically sensible that trading not entail losses for the listing venue.

A second category of delisting rules is designed to protect the reputation of the trading venue where the shares list. In other work, we have argued that exchanges traditionally provided a vector of services to investors and issuers, including standardized rules, monitoring of trading, clearing and settlement, liquidity, and a signaling function. Delisting rules allowed the exchange to preserve the value of the "signal" associated with listing on a particular trading venue. Thus, investors could rely on the integrity of firms listed on the exchange because their trading signified having met these underlying standards.

Whether such signal-based rules are still sensible is debatable; certainly, investors have myriad sources of information today regarding firm's prospects, suggesting less reliance on the listing venue. A second complicating factor is that where a firm trades is now often divorced from where a firm lists (see Macey and O'Hara [2002] for discussion). These factors undermine the traditional investor protection argument for delisting, as issue we will return to in Section 4 of the paper.

The legal requirements that cover delisting are remarkably complex, even within the context of securities laws generally. Adding to the complexity of the delisting rules is the significant discretion that the trading markets have in their application of these rules. This discretion allows listing venues considerable latitude in determining when to apply their delisting standards.

In the U.S., virtually all firms list on one of three venues: the New York Stock Exchange, the Nasdaq, and the American Stock Exchange.[3] The regional exchanges have the ability to list firms, but few do so actively. Just as listing criteria differ, so, too, do delisting criteria. As the NYSE and the Nasdaq rules cover most firms, it is useful to consider in more detail the specific rules of these two settings.

A. The NYSE

The NYSE sets out three numeric requirements for delisting, and numerous more subjective criteria. First, listed companies must meet minimum distribution requirements for their shares. Specifically, the New York Stock Exchange will consider delisting a firm if the number of total stockholders drops below 400, or the total number of stockholders is less than 1,200, and the average monthly trading volume for the previous twelve months is less than 100,000 shares.[4] The Exchange also will consider delisting when the number of publicly-held shares is less than 600,000.[5] These distribution rules seem designed to insure that there is continued trading volume in order to justify the costs to the Exchange of listing a stock.

Second, the Exchange will consider delisting if a company fails to meet certain market capitalization requirements.[6] The Exchange will consider delisting when either the average "global market capitalization" over a consecutive 30 trading-day period is less than $15 million. If total stockholders equity falls below 50 million, the average global market capitalization must

[3] Traditionally, firms have not listed on more than one venue, and the voluntary movement of firms between listing venues has virtually always involved firms "graduating" from the Nasdaq or Amex to the NYSE (the exception to this is Aeroflex, Inc. which shifted from the NYSE to the Nasdaq in February 2000). This single-listing practice has recently been called into question by Nasdaq's offer to waive listing fees for Dow-Jones Index funds listed on the NYSE, thus setting the stage for dual-listing. In February 2004, Hewlitt-Packard became the first firm to officially dual list on both markets.

[4] NYSE Listed Company Manual § 802.01(A). (hereinafter NYSE). These numerical cutoffs are designed to insure that there is a minimum amount of trading interest in securities listed on the NYSE. The total number of stockholders can fall to 400, unless the average monthly trading volume for the previous twelve months is less than 100,000 shares, in which case the total number of shareholders must be 1,200. Where total stockholders equity falls below the $50 million threshold, the global market capitalization increases from $15 million to $50 million

[5] *Id.*

[6] NYSE § 802.01(B).

be at least $50 million.[7] For companies that qualified for original listing under the global market capitalization standard, the Exchange will consider delisting if either the companies average global market capitalization over a thirty trading-day period is less than $100 million or the average global market capitalization over a thirty trading-day period is less than $500 million and total revenues are less than $20 million over the last twelve months, unless the entity qualifies for listing under a different original listing standard.[8]

Third, the Exchange will consider delisting if the average closing price of a security is less than one dollar over a consecutive thirty trading-day period.[9] If, however, the minimum average closing price is the only criteria the company fails to meet, it will not automatically be subject to the Exchange's delisting procedures.[10] Instead, the Exchange will notify the company, and provide it with six months to cure the deficiency.[11] If, after six months, the average closing price remains below one dollar, the Exchange will begin standard delisting procedures.[12]

In addition to the numeric criteria, just described, the Exchange will, at its discretion, consider delisting the company if it fails to meet a number of other criteria. The Exchange will consider delisting if the company's operating assets have been substantially reduced in size, regardless of the reasons for the reduction.[13] If the company files for bankruptcy, or announces its intention to file, "under any of the sections of the bankruptcy law," then the Exchange may

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[7] NYSE § 802.01(B)(i) and (ii). As with the numerical cutoffs regarding the number of shareholders the numerical cutoffs regarding market capitalization are designed to insure that there is a minimum amount of trading interest in securities listed on the NYSE. Where total stockholders equity falls below the $50 million threshold, the global market capitalization increases from $15 million to $50 million.

[8] NYSE § 802.01(B)(iii). Affiliated companies are not subject to the market capitalization standard, as long as their parent companies meet the standard and still control the affiliate.

[9] NYSE § 802.01(C).

[10] *Id.*

[11] *Id.*

[12] *Id.*

[13] NYSE § 802.01(D).

consider delisting.[14] Delisting is immediate, however, if the company files, or announces filing, and does not meet any of the numeric criteria or if the company later fails to meet the numeric criteria.[15]

The Exchange will also consider delisting if any of the following occurs: (1) the Exchange receives authoritative advice that the security is without value; (2) the securities registration is no longer effective; (3) proxies are not solicited for all meetings of stockholders; (4) the company violates its listing agreement; (5) whenever an entire class, issue, or series of securities are retired through payment or redemption; or (6) the company engages in operations that, in the opinion of the Exchange, are contrary to the public interest. Moreover, the Exchange will also consider delisting when any of the following conditions are met: (1) the number of publicly held-shares is less than 100,000; (2) the number of holders is less than 100; or (3) the aggregate market value of shares is less than $1,000,000.[16]

Finally, the Exchange reserves the right to "make an appraisal of, and determine on an individual basis, the suitability for continued listing of an issue in the light of all pertinent facts whenever it deems such action appropriate, even though a security meets or fails to meet any enumerated criteria."[17]

B. Nasdaq

The delisting requirements on the Nasdaq have many of the same features as the NYSE requirements. A company whose shares are listed on the Nasdaq National Market must meet certain "Maintenance Standards" in order to remain listed.[18] Specifically, Nasdaq will consider

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[14] *Id.*
[15] *Id*
[16] *Id.*
[17] An intriguing example of such discretionary delisting is the NYSE's delisting on February 20, 1961 of five Cuban railroads and sugar companies following the expropriation of the their assets by Fidel Castro's communist government.
[18] NASD Manual § 4450. (hereinafter NASD).

delisting if any of the following minimum criteria are not met: (1) stockholders' equity of $10 million, (2) 750,000 shares publicly held, (3) market value of publicly held shares of at least $5 million for thirty consecutive business days, (4) bid price not less than one dollar for thirty consecutive business days, (5) 400 shareholders of round lots, and (6) at least two market makers for ten consecutive business days. In addition, securities must be in compliance with the quantitative maintenance criteria in the NASD's Rule 4300 series. In addition, Nasdaq may also delist if the company files, or announces that the board has authorized liquidation, under any section of the bankruptcy laws.[19]

Like the NYSE, the Nasdaq Stock Market's formal justification for its continued listing requirements is, in essence, a signaling argument:

> The Nasdaq Stock Market stands for integrity and ethical business practices in order to enhance investor confidence, thereby contributing to the financial health of the economy and supporting the capital formation process. Nasdaq issuers, from new public companies to companies of international stature, by being included in Nasdaq, are publicly recognized as sharing these important objectives of The Nasdaq Stock Market. Nasdaq, therefore, in addition to applying the enumerated criteria set forth in the Rule 4300 and 4400 Series, will exercise broad discretionary authority over the initial and continued inclusion of securities in Nasdaq in order to maintain the quality of and public confidence in its market. Under such broad discretion… Nasdaq may deny initial inclusion or apply additional or more stringent criteria for the initial or continued inclusion of particular securities or suspend or terminate the inclusion of particular securities based on any event, condition, or circumstance which exists or occurs that makes initial or continued inclusion of the securities in Nasdaq inadvisable or unwarranted in the opinion of Nasdaq, even though the securities meet all enumerated criteria for initial or continued inclusion in Nasdaq.[20]

C. Corporate Governance Listing Standards

Both the NYSE and Nasdaq may delist companies not in compliance with their respective corporate governance listing standards. Delisting for noncompliance with these standards,

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[19] NASD § 4450(a)(1)-(a)(6); (e)(1)-(e)(3).
[20] NASD § 4300

however, is rare; the exchanges tend to encourage compliance through "negotiation with issuers."[21] Foreign companies can even obtain waivers for these requirements if similar requirements do not exist in the foreign state's law.[22] In light of the recent corporate scandals, both the NYSE and the Nasdaq have tightened their corporate governance listing standards. Whether such heightened standards result in actual delistings remains to be seen.

D. The Delisting Process

If the NYSE determines that delisting procedures are appropriate, then the Exchange staff will notify, in writing, the company, which must then issue a press release to that effect.[23] The company may request that the Committee of the Board of Directors of the Exchange review the decision within ten days of receiving the notification.[24] The Committee will receive briefs and oral arguments on the delisting.[25] The request for review usually stays the delisting proceedings. During the review, however, the Exchange may, at its discretion, suspend trading of the security.[26] Failing such review, the Exchange will suspend trading and apply to the Securities and Exchange Commission to strike the security from listing.[27]

Similarly, on the Nasdaq if the administrative staff deems it appropriate to begin delisting procedures, the staff will notify the company, which must then issue a press release disclosing that delisting has begun.[28] The company may appeal to the Nasdaq Hearing Panel.[29] The appeal automatically stays the delisting.[30] After an adverse judgment by the Nasdaq Hearing Panel, the

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[21] 57 Bus. Law 1487, 1491.
[22] *Id.* at 1514.
[23] NYSE § 804.00.
[24] *Id.*
[25] *Id.*
[26] *Id.*
[27] *Id.*
[28] NASD § 4815(a), (b).
[29] NASD § 4820(a).
[30] *Id.* Nasdaq may suspend trading of the security during the hearing period.

company may appeal to the Nasdaq Listing and Hearing Review Council.[31] This appeal does not, however, stay the delisting.[32] While it is possible to appeal an adverse judgment by either the NYSE or the Nasdaq to the SEC and then to the U.S. Court of Appeals for the District of Columbia, this is rarely done.

E. Trading After Delisting

If an issue has been delisted from the The Nasdaq Stock Market, the issue will be available for immediate quotation on the Nasdaq Over-the-Counter Bulletin Board (OTCBB), but only for firms that are not in bankruptcy, and that are current in their financial reporting with the Securities and Exchange Commission. There also is a formal requirement that market makers must have issued price quotations in the security during the 30-day period preceding its removal in order to be eligible for quotation on the OTCBB.[33] In principle, this means that, while many delisting Nasdaq stocks automatically can avail themselves of the liquidity provided by the OTCBB, firms delisted from the NYSE cannot, since their shares have not been quoted by a market maker during the previous thirty days. Because the OTCBB is a quotation medium for subscribing members and not an issuer listing service, a delisted Nasdaq or NYSE issuer cannot "list" themselves on the OTCBB. A delisted issuer that wishes to be quoted on the OTCBB must submit a request to the SEC and contact prospective broker-dealer firms to request that these firms register to quote their securities. The SEC typically expedites the approval process for NYSE firms, so that qualifying firms that are not bankrupt and have their SEC filings current can move quickly to the OTCBB upon delisting.

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[31] NASD § 4840.
[32] NASD §4840(b).
[33] Upon the delisting of a security not in bankruptcy and current in its SEC filings, market makers who have quoted the security during the 30-day period preceding its removal have 24 hours in which to register quote the security on the OTCBB. If the issuer does not meet all of the above criteria at the time of its delisting, voluntarily delists from the Nasdaq, or if no market makers register to quote the security, the usual Form 211 filing and review process will apply.

Most stocks delisted from the NYSE, and some stocks delisted from Nasdaq, move to the "Pink Sheets," a trading system operated by the private firm "Pink Sheets LLC."[34] The origins of the Pink Sheets date to 1904, when the National Quotation Bureau began as a paper-based, inter-dealer quotation service linking competing market makers in OTC securities. The Pink Sheets currently quote some 3900 issues, and it is essentially a quotation system for market makers willing to trade in these issues. There are no listing standards, and the Pink Sheets does not regulate the market.[35] This has led, in the past, to concerns about the market's fairness and opacity.

F. The Delisting Decision: Recent Evidence

Table 1 provides data on the total number of delistings from the NYSE, the Nasdaq, and the American Stock Exchange for the period 1995 – 2002. As is apparent, the number of delistings grew on all three exchanges, peaking at 1231 firms in 1999. Delistings have fallen somewhat since then but they are still substantial, with more than a 1000 firms delisting in 2001 and 747 in 2002. The large number of delistings has resulted in markets growing smaller, with fewer firms listed in 2002 than was the case in the previous years in the sample.

The delisting requirements discussed above allow exchanges to delist firms for a wide range of reasons. In addition, many delistings occur voluntarily as the natural consequence of a merger, a decision to take the firm private, or a voluntary liquidation. It is also becoming more common for non-U.S. firms to withdraw listings voluntarily as part of a retrenchment to listing only in their home market. **Table 2** provides evidence on the mix between voluntary and involuntary delistings. As is apparent, voluntary delisting is a much more important factor for

[34] See www.pinksheets.com. The term "pink sheets" derives from the color of the paper on which stock prices for the firms traded in this market are printed and distributed to traders. Currently the screen on which quotes and other market information, along with market makers' phone numbers are displayed is pink in color.
[35] Specifically, under securities law the Pink Sheets is categorized as a SIP, or securities information processor.

the NYSE than it is for the Nasdaq. Nonetheless, both venues have a substantial number of involuntary, or regulatory, delistings, and for the Nasdaq market regulatory and voluntary explanations have approximately equal incidence.

Firms that are involuntarily delisted often fail more than one of the delisting criteria. To determine the exact causes of delisting, we reviewed all of the involuntary delistings on the NYSE and the Nasdaq for the period 1999- 2002. Based on the statements given in the delisting announcement, we then categorized the main causes for delisting. These data are given in **Table 3** (note that the number of causes exceeds the total number of delisted firms due to multiple reasons for delisting). Not surprisingly, bankruptcy is an important cause for delisting on both markets. And clearly many firms also fail the minimum assets or market capitalization criteria. What is more intriguing is the important role played by minimum share price requirement. Indeed, on the Nasdaq, failure to meet the $1.00 share price is the most commonly cited cause of delisting, and it is the second most common reason on the NYSE.

One might have conjectured that firms whose share prices drop below the $1 level could have avoided delisting by means of a reverse stock split. Indeed, Nextel announced a reverse split in April 2003 specifically to avoid being delisted by the Nasdaq.[36] Yet, firms are often extremely reluctant to utilize reverse stock splits because this strategy provides a very negative

[36] On April 24, 2003, Nortel announced a reverse stock split in order to avoid delisting. See http://www.nortelnetworks.com/corporate/investor/icorner.html (accessed June 17, 2003). The "huge" stock split was effectuated in order to "fend off a "near-term delisting possibility." The split was designed to bring the firm's share price from a price of 64¢ to a price in the $10 to $20 range. See http://www. cnet.com/investor/brokeragecenter/newsitem-broker/0-9910-1082-20468497-0 (accessed June 17, 2003). Similarly, PopMail.com did a one-for-ten reverse stock split in October, 2000, but its stock continued to fall, and the company was delisted in January, 2001. See Ruth Simon, "More Companies Are Learning Harsh Lessons on Delistings," The Wall Street Journal, March 20, 2001, at C1.

signal to the market.[37] For example, Popmail found its 10-for-1 reverse split in October 2000 ineffective in supporting its stock price, leading to its delisting in January 2001. Thus, while some firms do succeed in raising their price via this method, its rarity suggests that for many firms the costs of doing so are simply too high.[38]

These data suggest that for many firms the delisting decision is not a voluntary one. And, having been delisted, the firm now faces the challenge of finding liquidity for its shares in another trading venue. The stockholders of such firms thus face a double whammy: having seen the value of their shares decline due to adverse fortunes, they now face the prospect of greatly reduced liquidity for these distressed shares. How large these liquidity costs are is clearly an important issue, and in the next section, we investigate these delisting costs in more detail.

III. From the NYSE to the Pink Sheets: The Impact of Delisting

A. Sample Firms

As noted earlier, for stocks delisted from the NYSE the choice of trading venues is limited. Although the listing requirements of the American Stock Exchange and the Nasdaq are less stringent, the commonality of many of the listing (and delisting) requirements suggests that moving to those venues is precluded for many delisted NYSE firms. Moreover as noted earlier, the OTCBB may not be immediately available for these NYSE firms, particularly for those firms who are bankrupt or not current in their SEC filings. Thus, most NYSE-delisted securities are relegated to trading on the Pink Sheets.

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[37] Barry Siegel, chairman and chief executive of Driversshield.com made the point succinctly: "Make no mistake, a reverse split is an act of desperation. It sends a terrible signal that management has tried everything it knows to lift the stock price and nothing has worked." http://www.twinight.org/avid/2001/avidchat0619pm.html (Avid Traders Tuesday Evening Chat, accessed June 17, 2003).

[38] For example, 7-Eleven, the Dallas convenience-store chain, completed a 1-for-5 reverse split in May 2000. The refinancing brought 7-11's share price up to $20.94 the day of the split from $4.19. Subsequently, the firm turned around its fortunes by reducing debt and improving earnings. The split also had "an important psychological effect in raising 7-Eleven shares above $10." Id.

To investigate the impact of delisting, we examined all firms involuntarily delisted from the New York Stock Exchange in year 2002. We found 63 such forced delistings, with 5 firms moving to the Amex, 1 to the Nasdaq, and the remaining 57 to the Pink Sheets.[39] As our interest is in post-delisting liquidity, we restricted our sample to those 57 firms moving to the Pink Sheets to avoid confounding effects arising from different trading mechanisms. We then obtained daily data from Pink Sheets, Inc. for closing prices, spreads, and volumes for our sample of firms (with one firm being deleted due to incomplete trading data) We also deleted one firm from the sample due to the lack of trading activity.[40] Our final sample is thus 55 firms, which are listed in **Table 4**.

Our sample includes a number of very prominent firms, including Enron, Global Crossing, USAirways, and Owens Corning, as well as some less familiar names such as Coastcast Corporation and Grubb &Ellis. The diversity in firms suggests that the effects of delisting may vary, particularly if the size of the firm is considered. To address this concern, we collected data on market capitalization as of January 2, 2001. Our sample firms all delisted at some point in 2002, so this data predate delisting by at least 12 months for each firm. As shown in Figure 1, these market capitalizations range from over $60 billion (Enron) to $15 million (Asia Pacific Wire & Cable Corporation Limited). For the overall sample, 9 firms have market capitalizations above $1 billion, 20 firms range between $100 million and $1 billion, and 27

[39] Of the sample firms moving to the Pink Sheets, 49 of 57 firms also end up trading on the OTCBB. For some stocks, listing on the OTCBB is approximately concurrent with Pink Sheet listing, but for other firms there is a delay. Interestingly, Enron did not trade on the OTCBB at any point in 2002.

[40] An examination for outliers in our trade data revealed one firm Panavision (PVI) had an average dollar spread more than 50% higher than any other stock in our sample. Further investigation found the stock to have the lowest NYSE volume (165 shares a day) and the lowest daily Pink Sheet volume (953 shares a day) of any stock in the sample. Further, PVI had positive volume on only 15 of the 60 days in our post-delisting period (for comparison, the stock with the second highest spread traded on 57 of 60 days). To avoid spurious inferences, we deleted PVI from the sample.

firm's have market capitalizations below $100 million. In the analysis that follows, we report results for both the overall sample and for various size-based subsets.

We also include in Table 4 the main explanations cited by the NYSE for each firm's delisting. Many of the firms violate multiple delisting criteria, but the most cited factors are share price below the minimum (40 firms) and market capitalizations below the minimum (39 firms). While these two conditions are often congruent, they are not always the same: 12 of the 39 firms delisted for market capitalization did not fail the share price requirement. Bankruptcy led to the delisting of 20 firms in our sample, with 17 of these firms also failing the share price requirement.

Earlier we noted that the listing venues can exercise considerable discretion in the application of the delisting criteria. To investigate how this discretion affects actual delistings, we collected closing prices for each of the 40 firms delisted for share price reasons. The NYSE average share price rule requires delisting if the 30 average share price falls below $1.00. Additionally, the NYSE can delist if the share price is "abnormally low".

Table 5 shows the number of trading days prior to the last day of trading on the NYSE a stock was in violation of the 30 day average price rule or the overall $1.00 rule. The data clearly show a wide disparity in application of the delisting rules. Bethlehem Steel, for example, violated the 30 day rule for more than 7 months (154 trading days), while Mutual Risk Management was delisted after only 1 day. Similarly, Acceptance Insurance Companies was booted out after failing the $1.00 requirement for 10 days, while Asia Pacific Wire &Cable Corp traded below $1.00 for more than 215 days. This lack of consistency suggests ambivalence on the part of the exchange towards enforcing its own standards.

A second complication in investigating the impact of delisting is that the timing of delisting and subsequent trading on the Pink Sheets varies across the firms in our sample. For example, for some firms, the NYSE announcement of delisting occurs on the last day of NYSE trading, while other firms continue to trade on the NYSE for a few days following the announcement. Similarly, some firms in our sample begin trading the next day on the Pink Sheets, while others face a few days hiatus before the resumption of trading. To enhance comparability, we define the delisting date as the announcement date of delisting. The opening date on Pink Sheets is the first day on which share transactions occur. Thus, our analysis for Pink Sheet trading is comparable across firms, but some firms may have interim trade data between the announcement date and Pink Sheet trading date that is not analyzed.

B. Pretty in Pink? Trading on the Pink Sheets

Table 6 provides data on the first day of Pink Sheet Trading for the stocks in our sample. We first examine the trading data from the overall sample, which is given in Panel A. A striking result is that trading volume is both large and variable on the opening day, ranging from 100 shares to more than 53 million shares. The average volume is just over 2 million shares while the median volume equals 74,000 shares. Thus, while trading volume is small for some firms, it is extremely large for others. Part of the explanation for these large volumes may lie in the very low trading prices of the stocks. As the data show, the value of trade on day 1 averages a little over half a million dollars, with the largest volume stock involving only $16 million in trading value. This value of trading actually rises over the first five days of trading, and then gradually declines over the first 60 days of trading. Perhaps not surprisingly, delisted stocks tend not to be strong performers.

Panels B, C, and D provide data for the three size subsets of our sample. Again, the data show surprisingly large trading volumes, with the largest 29 stocks in the sample averaging more than 1 million shares trading on opening day. For the largest 9 stocks, the median first day volume is more than 1 million shares, while the average volume is closer to 11 million. These large volumes suggest that, for at least the largest stocks, exchanges forego substantial trading revenue when they delist the security.

Investors also appear to face substantial costs, as evidenced by the average first day percentage spread of more than 40% and the median spread of 25%. These first day spreads appear to be quite volatile, suggesting that median first week spreads might give a better indication of trading costs. Here we find a median spread of 15.27% for the overall sample. For the sample as a whole, these median spreads remain relatively stable over the first 60 days of trading, and actually fall to an average of 11.53% for the three-month period. Nonetheless, the data suggest that investors face substantial costs in trading stocks moving to the Pink Sheets.

Examining the three subgroups, however, suggests that these costs are very different for traders in the largest stocks. For the 9 firms in our top size group, first day median spreads are just 2.47%, and they rise to 5.84 % when measured over the first 60 days of trading. By comparison, the 60 day median spread for the middle 20 stocks is 13.60% and it is 14.93% for the smallest 27 stocks in the sample. This disparity in spreads suggests that the trading mechanism per se is not the sole determinant of trading cost. Instead, the liquidity of firms also is affected by endogenous characteristics such as trading volume and the number of shareholders.

An interesting question is how these new entrants to the Pink Sheets fare in terms of return to their investors. **Figure 2** plots the value of $100 invested in an equally weighted portfolio of our sample stocks formed on their first day of Pink Sheet Trading. For comparison, we also

formed a similar portfolio composed of only the 9 largest stocks in our sample. We measure returns based on changes in closing prices. After 60 trading days, the value of both portfolios has declined, with the overall sample losing approximately 20% of value and the larger firms losing more than 40%. Interestingly, the values of both portfolios increase over the first weeks of trading, with the overall sample portfolio trading above (and at times almost 30% higher) its initial value for more than the first 30 trading days.[41] These data suggest that while purchasing stocks on the first day of Pink Sheet trading and holding no more than 30 days may be a profitable trading strategy for stocks overall, it is not profitable for the larger stocks. Given both the meager trading volume in small stocks, and the large spreads in all stocks, however, it is implausible that returns remain positive when overall trading costs are properly included.

C. The Impact of Delisting: Before and After Comparisons

The data show that traders face substantial liquidity costs once stocks begin trading on the Pink Sheets. What is not clear, however, is whether these costs are any greater than the costs accompanying trading on the NYSE before delisting. A related question is how the delisting decision, per se, affects the overall price and trading volume of the stock. To address these issues, we gathered data for the 60 day pre-delisting period for each stock in our sample from the TAQ data base and from CRSP. **Table 7** summarizes this data for prices, volumes, spreads and volatility.

Perhaps the most immediate impact of the delisting announcement is on price. On the day before the delisting announcement, the average stock in our sample closed at a price of 0.95, with the closing price even lower (0.57) for the 9 large firms. Examining closing prices from the first day of trading on the Pink Sheets reveals a closing price for the sample of 0.48, with the

[41] One factor that may be influencing the initial behavior of these stocks is portfolio rebalancing, as the clientele of investors changes to reflect the unlisted status of these shares. SEC rules preclude most institutions from holding unlisted shares, thus forcing owners to move out of these shares.

large stocks closing at only 0.16. We caution that, as noted earlier, welfare comparisons across stocks are problematic due to the different timing of the actual delisting and subsequent Pink Sheet trading, but the data do support the conclusion that the movement to the new trading venue is not a positive experience for the stock.

This conclusion is made even more evident by looking at the spread data. **Figure 3** depicts average percentage spreads for the 60 day period before delisting and the 60 day period after Pink Sheet trading begins. For the sample as a whole, percentage spreads increased from an average of 5.889% in the pre-period to 16.939% in the post-period. Focusing on a five-day pre and post window, spreads widened from 7.414% to a stunning 26.687%. The spread behavior for the 9 large stocks is also greatly affected, doubling in the 60 day pre-and-post window (from 3.62% to 6.80%), but increasing by a factor of 4 in the five day window (1.75% to 8.17%). As indicated in Table 7, all of these changes are statistically significant.

Figure 4 provides the corresponding average dollar spread data for the sample. For the sample as a whole, the average dollar spread increases from .055 to .086 in the 60 day intervals, and from .05 to .113 in the 5 day intervals. What is more intriguing is the behavior of the large stock average dollar spread. This spread actually falls from .023 to .0065 when measured across the combined 120-day interval, and it drops from .02 to .009 when measured across the combined 10-day interval. That average dollar spreads are lower in the Pink Sheets than they were on the NYSE for these large stocks is an intriguing, and unexpected, finding.

To investigate this result further, we plotted in **Figure 5** the average dollar spread and the average stock price over the combined 120 trading days for the 9 large firm sample. The graph clearly shows the dramatic price decline preceding the stock's delisting. And the data reconcile the higher percentage spread/lower dollar spread behavior in the after market by showing that

prices have declined to very low levels. But what remains a puzzle are the spreads on the NYSE in the pre-delisting period. Here we find that despite the dramatic fall in price, spreads remain virtually constant at around .02 per share, and only drop when the stock shifts to trading on the Pink Sheets.

One conjecture for this behavior is that the spreads reflect a higher fixed cost of market making on the NYSE. Evidence in support of this conjecture can be found in the data on volume and volatility. A basic insight in market microstructure models (see O'Hara [1995]) is that bid-asked spreads generally decrease as trading volume goes up and increase as price volatility goes up. **Figures 6** and **7** clearly show that volume decreases when stocks move to the Pink Sheets, and volatility more than doubles for the sample as a whole. Thus, the anomalous NYSE spread behavior is not explained by natural properties of the order flow, as the volume and volatility effects would be expected to increase, not decrease, dollar spreads.

These findings, in turn, suggest two things about the NYSE trading environment. First, the data show the important role played by the penny pricing increment in use at the NYSE. The NYSE does not permit price quotes at the sub-penny level, dictating that spreads also cannot be less than one cent. The Pink Sheets allows sub-penny pricing, and the dramatic drop in spreads for the largest stocks to approximately one-half cent reflects this greater price flexibility.[42] Second, the data suggests that the Exchange specialist's "affirmative obligation" to maintain a high quality, continuous two-sided market for listed stocks actually does cause specialists to behave differently than they would in the absence of such obligations.[43] In particular, our data

[42] Taking Enron as an example, in the 60 day period before its delisting there is never a sub-penny quote, and spreads fluctuate between 1 and 2 cents. Upon moving to the Pink Sheets, spreads in the first week are approximately ½ cent.

[43] Specialists are expected to stabilize stock price movements by buying for and selling from their dealer accounts against the prevailing trend of the market, i.e., to purchase on minus and zero minus ticks, and sell on plus and zero plus ticks. For a discussion of the specialist's obligations see Stoll [1998]. The Exchange currently uses several

are consistent with a cross-subsidization effect in which stocks with higher trading volume subsidize stocks that trade relatively infrequently. The dramatic deterioration of liquidity for the smaller, less traded stocks in our sample is consistent with this effect.

One final issue we consider in our analysis is the differential behavior of firms delisted because of bankruptcy. Panel B of Table 7 gives the relevant data for the 60 day pre and post delisting periods for the 20 delisted bankrupt stocks and the 35 delisted non-bankrupt stocks. The data from the bankrupt sample suggest dramatic differences between trading on the NYSE and trading on the Pink Sheets. Overall, trading costs deteriorate, with dollar spreads doubling and percentage spreads more than tripling for bankrupt firms. We tested for whether differences in dollar spreads moving from the NYSE to the Pink Sheets are different depending upon whether the stock is bankrupt or not. We were unable to reject the hypotheses that the two groups were the same.[44]

Perhaps more intriguing are the volume effects, with trade executions for the bankrupt sample falling from almost 5 million shares a day to just over 2 million shares a day on the Pink Sheets. Conversely, volume is little affected for the non-bankrupt sample, with no statistically significant difference in trading before and after delisting occurs. One explanation for these divergent effects is simply size. As shown in Table 4, the bankrupt firms include a

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programs to measure specialist performance including (1) specialist capital utilization, which focuses on a specialist unit's use of its own capital in relation to the total dollar volume of trading activity in the he unit's stocks; (2) the so-called "near neighbor" approach which compares the performance in a stock over "rolling" three-month periods to the performance of stocks with similar trading characteristics; and (3) the standards of acceptable performance specified in Rule 103A. Information on these measures is supplied to the Allocation Committee for its use in determining the allocation of listing companies. Stocks are allocated to specialists by the NYSE Allocation Committee. NYSE Information Memo 97-55. Listing firms are not permitted to choose their specialists, and the allocation committee looks, among other things, at the distribution of high volume and low volume stocks among the specialist firm's current portfolio of stocks when making its decision about which specialist firm should receive a new allocation.

[44] We caution, however, that drawing statistical inferences between these two groups is compromised by the small sample sizes, their diversity, and by the potential for measurement problems in the variables created by the very low price levels.

preponderance of the largest firms in our sample, and comparison of the bankrupt and large firm samples in Table 7 reveals very similar behavior.

Overall, the data provide compelling evidence that moving from the NYSE to the Pink Sheets imposes large costs on traders. Moreover, the large volumes that transact for at least the larger stocks suggest that the Exchange loses valuable trading opportunities as well. Having established these costs, we turn in the next section to the questions of who benefits from delisting and whether the current delisting process is optimal.

IV. The Delisting Dilemmas: Why and How?

Given the substantial costs associated with delisting, what then is the rationale for continuing this practice? To address this query we need to consider who benefits from delisting stocks. The analysis above suggests that it is not the firms whose stocks are delisted, nor is it their shareholders. By virtually every metric, moving from being Exchange-listed to trading on the Pink Sheets is "hazardous to your wealth". But there other constituencies to consider, most notably the exchange itself, the general trading public, and even the overall capital market: Does anyone actually benefit from delisting stocks?

Certainly, for very infrequently traded stocks, the exchange benefits from delisting. As we have seen, some firms, particularly the very small ones, trade infrequently both on the NYSE and on the Pink Sheets. The deterioration of spreads upon moving to the Pink Sheets is consistent with these firms being expensive to trade, suggesting that the NYSE's practice of delisting these firms is motivated by economic grounds.

What is less clear is the argument that delisting benefits exchanges because it upholds the signaling value attached to an exchange listing. Interestingly, the delisting issue, perhaps more

than any other issue, brings into sharp analytical focus the tension between the view of stock markets simply as "liquidity providers" and the view of stock markets as purveyors of a complex array of relational "listing services" including standard form rules, clearing and settlement, signaling, and monitoring, as well as liquidity. Delisting advances the markets' signaling function, but diminishes the role of the markets as liquidity providers.

The issue of whether to delist a company involves a trade-off between the role of the stock exchange in signaling quality and the role of the stock exchange in providing liquidity. In our view, the benefits of delisting have diminished over time, but the costs of delisting have not diminished as much. While there are many close substitutes for the informational signal provided by exchange listing, delisting eliminates the primary, and sometimes the only source, of liquidity for the firm being delisted. This cost-benefit trade-off does not seem compelling to us.

A related argument advanced to support delisting is that it is needed to protect potential investors. This argument relies on the notion that investors draw inferences from, and indeed make trading decisions based on, the very fact that a firm is listed on a particular exchange. Thus, exchanges must ensure that only firms meeting the standards of the exchange are traded there, otherwise investors are misled. While plausible on some dimensions (delisting in the cases of company fraud, for example), there appear to us to be two problems with this argument more generally. First, it is just not clear how important the listing venue is for individual traders: would more people really be willing to invest in Intel if it were listed on the NYSE than on the Nasdaq? Second, and perhaps more to the point, if investor protection is really the rationale for delisting, why do exchanges allow firms that fail the listing requirements to remain trading for months and months? Our data in Table 5 show little consistency in delisting application, and the Nasdaq has a similar track record when it comes to delisting stocks whose price falls below the

mandated $1.00 level. Perhaps part of Nasdaq's reluctance to delist such low-priced firms is due to their prevalence; after the bursting of the "dot.com bubble" in the Summer of 1998, as many as 10 percent of all Nasdaq stocks were failing this requirement.[45]

This ambivalence of the part of the exchange to enforce their delisting rules is, in our view, well-founded. The provision that firms be delisted when their share prices fall below $1 appears to be both useless and pointless. The rule is pointless because it is predicated on share price rather than market capitalization. The rule is useless because, at least in theory, a firm whose share price drops below the $1 threshold can avoid delisting by effectuating reverse stock-splits, decreasing the number of shares outstanding, and increasing the share price, until the price rises. Unfortunately, the $1.00 rule is not harmless, as it also triggers a number of other market and regulatory responses that tend to depress stock prices.[46]

What then is the "right" way to handle delisting? We offer two alternatives for consideration. First, we advocate a compromise between the "death penalty" of delisting from the NYSE and the alternative of simply continuing with a listing. Where a specialist wishes to continue to trade and to provide market-making services in a stock that fails to meet the NYSE's continued listing criteria, the firm's shares could be given a new ticker-symbol designation,

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[45] Aaron Lucchetti, "Tough Rules, Bear Market Throw Stocks Off Nasdaq," The Wall Street Journal, October 12, 2003, at C1.

[46] The regulatory odds are stacked heavily against firms as their share price drops below the $5 and the $1 per share thresholds. The Securities and Exchange Commission has especially strict "suitability" rules designed to discourage inexperienced investors from buying so-called "penny stocks" whose price is below $1 per share. The Securities Enforcement and Penny Stock Reform Act of 1990 provides additional powers to the Securities and Exchange Commission to police penny stocks, makes it easier for litigants to prove that such stocks have been manipulated, and imposes added requirements on brokers and market-makers in penny stocks (for more discussion of this Act see Beatty and Kadiyala [2003]). Brokerage firms typically don't follow penny stocks. For example, at Merrill Lynch, the largest retail brokerage, brokers are prohibited from recommending shares that aren't rated by the firm's research analysts. With regard to non-regulatory responses, analysts generally don't rate penny stocks. Even Internet message boards discourage discussions related to penny stocks. For example, the Motley Fool does not allow discussion of stocks unless they have traded over $5 per share for the past 30 consecutive days. Of course, these market reactions are linked to the regulatory responses: when companies' shares are delisted, it becomes more difficult to obtain information about them, so trading becomes more costly for market participants.

perhaps an X appended to the old designation, in order to signal to potential investors and other market participants that the firm no longer qualifies for listing.

This compromise implicitly recognizes the "bargain" made by listing firms and the exchange when the listing decision was made in better times. Now that the firm is facing adverse times, the shareholders need for a trading venue is perhaps even more important; continued trading on the exchange, even as an "unlisted" security, provides this benefit. We suggest that this compromise position would actually improve the quality of the signal provided by delisting. Firms that commit fraud, or otherwise present dangers to current or future investors could, and should, still be formally delisted. But viable firms that simply are undergoing temporary business set-backs should not be expelled from exchange or market trading merely because they fail to meet some arbitrary rule such as the $1 minimum bid requirement.

Second, there needs to be a more formal market for firms who do not, or can not, remain on their original trading venues. The current free-fall for firms to a trading venue featuring no listing standards, no corporate governance requirements, and no market regulation is hardly satisfactory. Here, the Nasdaq market seemed to be evolving towards a solution, with delisting from the Nasdaq National Market resulting in relegation to the Nasdaq Over-the-Counter Bulletin Board (OTCBB), which, at one point, was scheduled to be replaced by an even more attractive alternative, the Nasdaq Bulletin Board Exchange (BBX). However, the competitive difficulties of the now publicly-traded Nasdaq market have caused a retrenchment in Nasdaq's plans, and the BBX has been scrapped, at least for the time being.

Other alternatives that might fill this gap are the new ArcaBB, an alternative trading system owned by Archipelago, and the Alternative Display Facility (ADF) run by the NASD. But ArcaBB, formerly known as GlobeNet, has not flourished thus far, and the ADF is still

mired in the political controversy surrounding SuperMontage and its competition with the ECNs. It seems unlikely that these alternatives will evolve into a market for delisting securities any time soon. This inertia suggests that the current market structure may characterize unlisted stock trading for some time to come.

Delisting is a traumatic event for both firms and shareholders alike. As we have shown in this paper, the rationale for delisting is questionable, but the deleterious effects are not. The SEC is currently considering a number of trading practices in the U.S. markets that have been typically left to the discretion of markets, including the dual-listing of stocks, the self—regulation of markets, and the corporate governance of exchanges. We suggest that the delisting of stocks is another area where greater policy analysis is needed.

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Table 1
Delistings from U.S. Stock Exchanges and Markets 1995- 2002

This table gives the number of firms delisting in each year from the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and the Nasdaq market. These numbers include both voluntary and involuntary delistings. The data are taken from the NYSE Fact Book; NYSE delisting announcements on web site; the Nasdaq web site; and from data provided by the AMEX Research Department.

YEAR	NYSE	Nasdaq	AMEX	Annual
2002	145	569	33	747
2001	213	665	125	1003
2000	286	475	73	834
1999	254	873	104	1231
1998	209	769	101	1079
1997	183	688	112	983
1996	105	557	87	749
1995	102	547	77	726
Total period	1497	5143	712	7352

Table 2
Voluntary and Regulatory Delistings 1998-2002

This table gives the total number of firms delisted from the New York Stock Exchange and the Nasdaq market for the years 1998-2002. Voluntary delistings are those instigated by the firm and arise for reasons such as mergers or a firm's decision to move to another exchange or to go private. Regulatory delistings are instigated by the exchange or market when a firm is in violation of the listing requirements. Data are taken from the NYSE web site and the Nasdaq web site.

	1998	**1999**	**2000**	**2001**	**2002**
New York Stock Exchange					
Total Delistings	209	254	286	213	145
Voluntary	180	204	225	148	82
Regulatory	29	50	61	65	63
Nasdaq Market					
Total Delistings	769	873	475	665	569
Voluntary	280	433	235	275	289
Regulatory	489	440	240	390	280

Table 3
Causes of Delisting 1999-2002

Panel A. Regulatory Delistings from the New York Stock Exchange

This table gives data on reasons cited for firms delisting from the NYSE. Regulatory delistings often are for violations of several standards, so the total number of causes exceeds the total number of firms delisted in a given year. Data are from the NYSE delisting announcements.

	Total	1999	2000	2001	2002
NYSE Regualtory Delistings	239	50	61	65	63
Reasons Stated for Delisting:					
Price below minimum	123	6	28	46	43
Market cap below minimum	163	25	44	50	44
Bankruptcy	73	13	19	19	22
Delinquent in SEC filings	8	3	1	3	1
Net Tangible Assets / Net Income below minimum	21	21	0	0	0
Other	11	3	2	2	4

The Other category for NYSE delistings includes reasons such as: accounting irregularities, going concern emphasis by auditors, and company under investigation by SEC for misstatements.

Panel B. Regulatory Delistings from the Nasdaq Market

This table gives data on reasons cited for firms delisting from the Nasdaq market. Regulatory delistings often are for violations of several standards, so the total number of causes exceeds the total number of firms delisted in a given year. Data are from the Nasdaq delisting announcements.

	Total	1999	2000	2001	2002
Nasdaq Regulatory Delistings	1350	440	240	390	280
Reasons Stated for Delisting:					
Price below minimum	681	257	97	218	109
Market cap below minimum	15	0	4	3	8
Bankruptcy / Liquidation	194	31	36	79	48
Delinquent in SEC filings	156	40	31	53	32
Net Tangible Assets / Net Income below minimum	556	190	95	138	133
Market Float / Insufficient shares held by public	178	93	31	54	0
Public Interest	145	28	29	71	17
Insufficient number of market makers	78	40	15	23	0
Other	128	57	26	34	11

The Other category for Nasdaq delistings includes: failure to provide requested information, failure to comply with qualifications and violations of reverse merger requirements.

Table 4
Sample stocks delisted from NYSE in 2002: Market capitalization and Delisting Causes

			NYSE stated reasons for Delisting:		
Company	Market capitalization at beginning 2001 ($ millions)	Share Price below minimum	Market cap below minimum	Bankruptcy	Other
Enron Corp	61,422	•		•	
Global Crossing	12,991	•		•	
NTL	6,505	•	•		
Conseco	4,290	•		•	
US Airways Group	2,719			•	
Comdisco	1,742	•		•	
APW	1,323	•	•		
NewPower Holdings	1,214	•			•
Viasystems Group	1,112	•	•		
Williams Communications Group	802	•		•	
Key3Media Group	792	•			
Covanta Energy Corporation	763	•		•	
Mutual Risk Management	626	•			•
EOTT Energy Partners	450	•		•	
Asia Global Crossing	446	•		•	
GenTek	335		•		
A.C.L.N.	330				•
Encompass Services Corporation	320	•	•		
Kaiser Aluminum Corporation	293	•	•	•	
Bethlehem Steel Corporation	231	•		•	
Cornerstone Propane Partners	200	•	•	•	
Exide Technologies	194	•	•		
Polymer Group	172	•	•	•	
Federal-Mogul Corporation	163	•		•	
Magellan Health Services	143	•	•		
London Pacific Group	142	•	•	•	
Coastcast Corporation	129		•		
PlanVista Corporation	127		•		
Grubb & Ellis Company	119		•		
Armstrong Holdings	84			•	
Acceptance Insurance Companies	75	•	•		
Budget Group	75	•	•		
BNS Co.	65		•		
The FINOVA Group	61	•	•	•	
GAINSCO Inc	55	•	•		
Airlease Ltd	55		•		
LASER Mortgage Management	48				•
Chart House Enterprises	47	•	•		
National Equipment Services	45	•	•		
Owens Corning	45	•	•	•	
J Net Enterprises	45		•		
Personnel Group of America	44	•	•		
Superior TeleCom	41	•	•		
Guilford Mills	31	•	•		
The Alpine Group	30		•		
Galey & Lord	30	•	•		
Philips International Realty Corp	30		•		•
Clarion Commercial Holdings	29		•		
Oakwood Homes Corporation	29	•	•	•	
National Steel Corporation	23		•	•	
American Skiing Company	23	•	•		
Atchison Casting Corporation	22	•	•		
China Enterprises	15	•	•		
Insteel Industries	15	•	•		
Asia Pacific Wire & Cable Corp	15	•	•		

The table displays the name, market capitalization and reasons given by the NYSE for delisting each of the 55 firms in the sample of stocks that were delisted from NYSE and subsequently traded on Pink Sheets. The Other category includes failed merger arrangement (NewPower Holdings), planned liquidations (LASER Mortgage Management and Philips International Realty) and NYSE concerns about the adequacy of information disclosed by the company (both A.C.L.N. Ltd and Mutual Risk Management). The sample of 55 stocks is subdivided into three samples based on market capitalization at the beginning of 2001. The largest subsample comprises 9 stocks, each with market capitalization in excess of $1 billion. The middle group contains 20 stocks with market capitalizations between $100 million and $1 billion. The remaining 26 stocks make up the third subsample with market capitalizations less than $100 million. Market capitalization is calculated as the number of shares outstanding multiplied by the closing share price.

Table 5
Sample Firms Delisted for Minimum Share Price Reasons

The Table shows the number of trading days prior to the last day of trade on NYSE that the stock is in violation of the share price rules. A stock violates the NYSE 30 day average price rule if its average daily closing share price calculated over the preceding 30 days is below $1. The left column shows the number of continuous trading days prior to the stock's last day of trade on NYSE that the stock is in violation of the 30 day average price rule. An entry of "Not in violation" indicates that the stock's 30 day average share price calculated on the date of last trade on NYSE was not less than $1. The right column shows the number of continuous trading days prior to the stock's last day of trade on NYSE that the stock had a price less than $1.

Companies cited for share price violations	Continuous trading days in violation of 30 day rule prior to last day NYSE	Continuous trading days with price less than $1 prior to last day NYSE
Enron Corp	3	25
Global Crossing	14	32
NTL	49	59
Conseco	not in violation	12
Comdisco	140	63
APW	35	52
NewPower Holdings	62	78
Viasystems Group	91	104
Williams Communications Group	not in violation	17
Key3Media Group	25	41
Covanta Energy Corporation	7	8
Mutual Risk Management	1	17
EOTT Energy Partners	not in violation	2
Asia Global Crossing	21	34
Encompass Services Corporation	73	88
Kaiser Aluminum Corporation	29	42
Bethlehem Steel Corporation	154	163
Cornerstone Propane Partners	6	17
Exide Technologies	7	24
Polymer Group	102	124
Federal-Mogul Corporation	31	45
Magellan Health Services	19	40
London Pacific Group	not in violation	1
Acceptance Insurance Companies	not in violation	10
Budget Group	81	92
The FINOVA Group	47	57
GAINSCO Inc	29	45
Chart House Enterprises	67	89
National Equipment Services	29	40
Owens Corning	23	11
Personnel Group of America	90	107
Superior TeleCom	96	63
Guilford Mills	86	103
Galey & Lord	74	77
Oakwood Homes Corporation	9	29
American Skiing Company	93	82
Atchison Casting Corporation	17	33
China Enterprises	29	35
Insteel Industries	83	84
Asia Pacific Wire & Cable Corp	200	215

Table 6
Trading on the Pink Sheets

Panel A: Sample of 55 stocks

	Mean	Median	Minimum	Maximum
Volume (number of shares) on Day 1	2,211,053	74,300	100	53,341,600
Value of trade ($) on Day 1	508,595	11,000	65	16,269,188
Mean daily Value of trade, Days [1,5]	544,661	40,350	433	13,061,038
Mean daily Value of trade, Days [1,20]	312,078	38,482	244	7,235,380
Mean daily Value of trade, Days [1,60]	165,676	23,374	407	3,407,113
Percentage Spread (%) on Day1	40.04	25.00	0.84	177.36
Mean percentage spread, Days [1,5]	26.69	15.27	1.27	152.08
Mean percentage spread, Days [1,20]	20.51	13.11	1.13	123.25
Mean percentage spread, Days [1,60]	16.94	11.53	1.68	104.12
Panel B: Subsample of largest 9 stocks				
Volume (number of shares) on Day 1	10,752,278	1,330,900	31,100	53,341,600
Value of trade ($) on Day 1	2,570,376	187,904	622	16,269,188
Mean daily Value of trade, Days [1,5]	2,500,577	803,951	28,838	13,061,038
Mean daily Value of trade, Days [1,20]	1,427,130	906,552	28,802	7,235,380
Mean daily Value of trade, Days [1,60]	702,331	410,549	13,388	3,407,113
Percentage Spread (%) on Day1	20.84	2.47	0.84	133.33
Mean percentage spread, Days [1,5]	8.17	2.44	1.27	38.92
Mean percentage spread, Days [1,20]	6.59	4.05	1.13	18.89
Mean percentage spread, Days [1,60]	6.80	5.84	1.68	15.98
Panel C: Subsample of middle 20 stocks				
Volume (number of shares) on Day 1	1,093,365	292,300	200	6,131,800
Value of trade ($) on Day 1	192,574	26,615	230	1,141,770
Mean daily Value of trade, Days [1,5]	279,354	51,567	1,219	2,566,996
Mean daily Value of trade, Days [1,20]	158,045	61,568	3,055	1,234,454
Mean daily Value of trade, Days [1,60]	93,927	33,494	5,144	605,362
Percentage Spread (%) on Day1	30.25	19.09	3.39	107.69
Mean percentage spread, Days [1,5]	20.46	12.76	2.72	71.25
Mean percentage spread, Days [1,20]	21.00	11.41	2.25	118.31
Mean percentage spread, Days [1,60]	17.49	13.60	2.42	88.82
Panel D: Subsample of smallest 26 stocks				
Volume (number of shares) on Day 1	114,235	12,950	100	1,085,600
Value of trade ($) on Day 1	37,994	3,268	65	488,520
Mean daily Value of trade, Days [1,5]	71,696	15,733	433	364,009
Mean daily Value of trade, Days [1,20]	44,585	12,361	244	277,105
Mean daily Value of trade, Days [1,60]	35,103	10,152	407	230,510
Percentage Spread (%) on Day1	54.22	38.81	5.13	177.36
Mean percentage spread, Days [1,5]	37.88	26.50	3.52	152.08
Mean percentage spread, Days [1,20]	24.95	14.96	3.75	123.25
Mean percentage spread, Days [1,60]	20.02	14.93	3.94	104.12

The table displays summary trading data from Pink Sheets on a sample 55 stocks (Panel A) that were delisted from NYSE and subsequently traded on Pink Sheets. The sample of 55 stocks is divided into three subsamples based on market capitalization at the beginning of 2001. Panel B displays data on the largest 9 stocks being those firms with market capitalizations in excess of $1 billion. Panel C displays the subsample of 20 stocks with market capitalizations between $100 million and $1 billion. Panel D shows the remaining 26 stocks which have market capitalizations less than $100 million. Day 1 refers to the first day of trade on Pink Sheets. Day [1,t] denotes the first t days of trade on Pink Sheets. Value of trade is defined as volume × closing share price. Percentage spreads are calculated as (closing ask price –closing bid price) / (midpoint of closing ask and bid prices)×100. Mean daily Value of trade, Days [1,t], for instance, is the mean over time of the daily Value of trade from Day 1 through to Day t.

Table 7
Before and After Delisting Trading: NYSE and Pink Sheets

Panel A

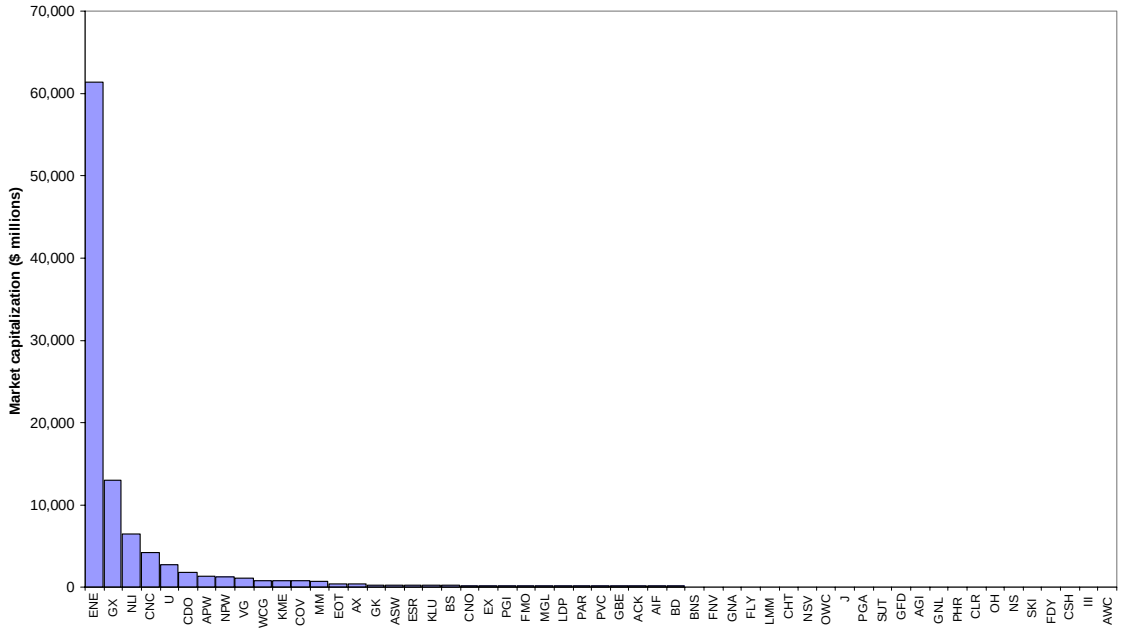
	Sample of 55 stocks	Sample of largest 9 stocks
Average share price on NYSE the day prior to delisting announcement	0.95	0.57
Average share price on first day of trade on Pink Sheets	0.48	0.16

Panel B	**NYSE days [-60,-1]**	**Pink Sheets days [1,60]**	**t-statistic**	**p-value**
Sample of 55 stocks				
Mean dollar spread ($)	0.0551	0.0865	-10.57	< 0.0001
Mean percentage spread (%)	5.889	16.939	-20.28	< 0.0001
Mean daily volume (number of shares)	1,944,595	908,190	5.374	< 0.0001
Mean volatility	0.1037	0.2111	-5.018	< 0.0001
Sample of largest 9 stocks				
Mean dollar spread ($)	0.0232	0.0065	23.041	< 0.0001
Mean percentage spread (%)	3.621	6.804	-9.212	< 0.0001
Mean daily volume (number of shares)	9,806,144	3,839,080	5.205	< 0.0001
Sample of 20 bankrupt stocks				
Mean dollar spread ($)	0.0360	0.0607	-10.384	< 0.0001
Mean percentage spread (%)	3.634	12.971	-20.393	< 0.0001
Mean daily volume (number of shares)	4,945,943	2,012,476	5.682	< 0.0001
Sample of 35 non-bankrupt stocks				
Mean dollar spread ($)	0.0660	0.1013	-7.937	< 0.0001
Mean percentage spread (%)	7.178	19.206	-16.65	< 0.0001
Mean daily volume (number of shares)	229,540	277,170	-1.701	0.093

Panel C	**NYSE days [-5,-1]**	**Pink Sheets days [1,5]**	**t-statistic**	**p-value**
Sample of 55 stocks				
Mean dollar spread ($)	0.050	0.113	-4.691	0.0080
Mean percentage spread (%)	7.414	26.687	-5.47	0.0053
Mean daily volume (number of shares)	1,552,799	2,674,674	-3.059	0.0201
Mean volatility	0.1285	0.3879	-1.859	0.1361
Sample of largest 9 stocks				
Mean dollar spread ($)	0.0207	0.0090	4.803	0.0014
Mean percentage spread (%)	1.759	8.172	-2.013	0.1142
Mean daily volume (number of shares)	3,849,409	11,991,158	-5.960	0.0017

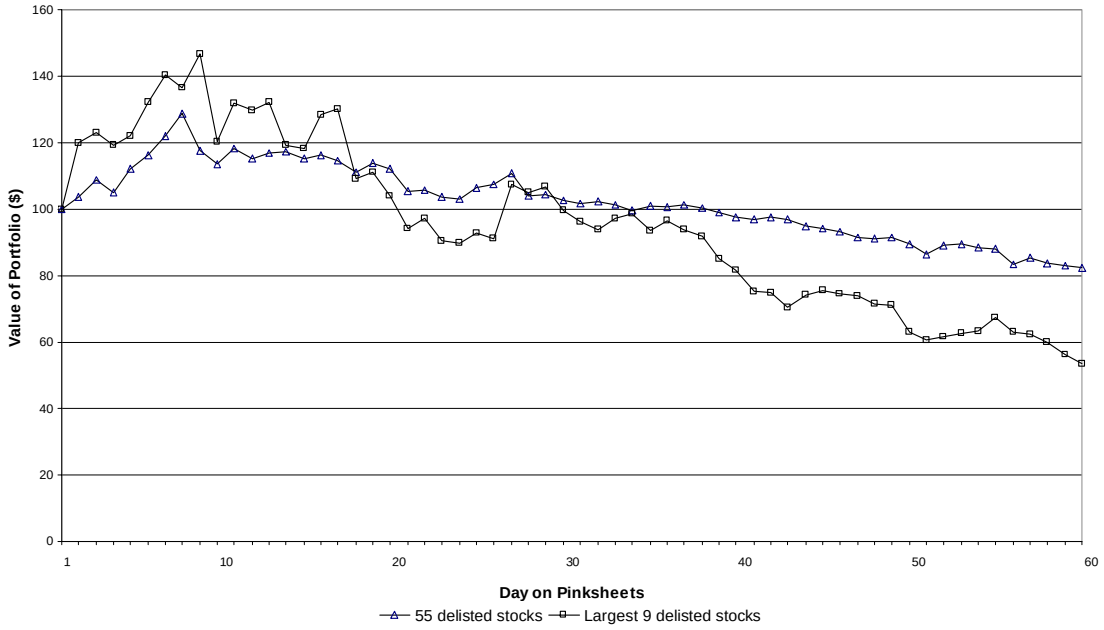
The table displays information about a sample of 55 stocks that were delisted from the NYSE in 2002 and subsequently traded on Pink Sheets. Also shown are sub-sample data for: the largest 9 of those stocks, 20 bankrupt stocks and the 35 non-bankrupt stocks. Panel A shows the average share price on the NYSE for the 55 stock sample and the largest 9 stock sub-sample on the day before the NYSE delisting announcement date and on the first day of trade on Pink Sheets. The average share price is calculated as an equally weighted average of the share prices of the stocks comprising the sample. Panel B provides information on mean spreads, volume and volatility over a period of 60 days prior to the NYSE delisting announcement date and 60 days post listing on Pink Sheets. Dollar spreads are defined as (closing ask price – closing bid price). Percentage spreads are calculated as (closing ask price –closing bid price) / (midpoint of closing ask and bid prices)×100. Volatility for a given day is calculated as the standard deviation of daily returns of the 56 stocks in the sample. Panel C provides information on the same variables in Panel B except averages are taken over a period of 5 days before the NYSE delisting announcement date and 5 days after listing on Pink Sheets. Difference of means tests are two-sided tests and assume unequal variances.

Figure 1
Market capitalization at beginning of 2001 of sample of 55 stocks delisted from NYSE in 2002



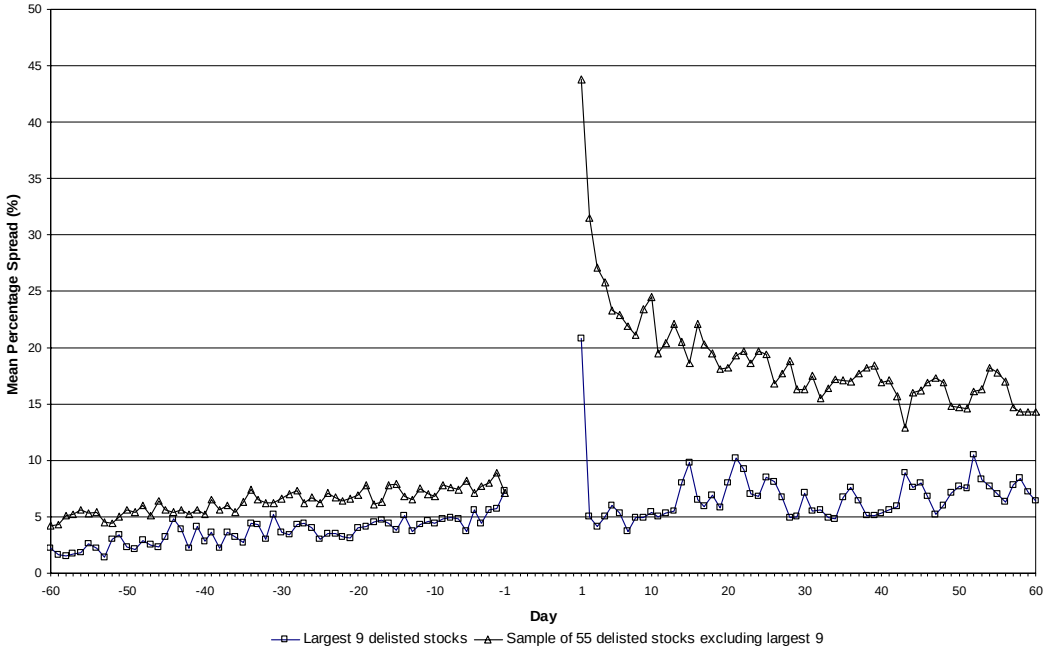
The figure plots the market capitalization in millions of dollars as at beginning of 2001 of the sample of 55 stocks delisted from NYSE in 2002. Market capitalization is calculated as the number of shares outstanding multiplied by the closing share price. Stocks are identified by their NYSE ticker symbols along the horizontal axis. Refer also to Table 4.

Figure 2
The value of investment on Pink Sheets



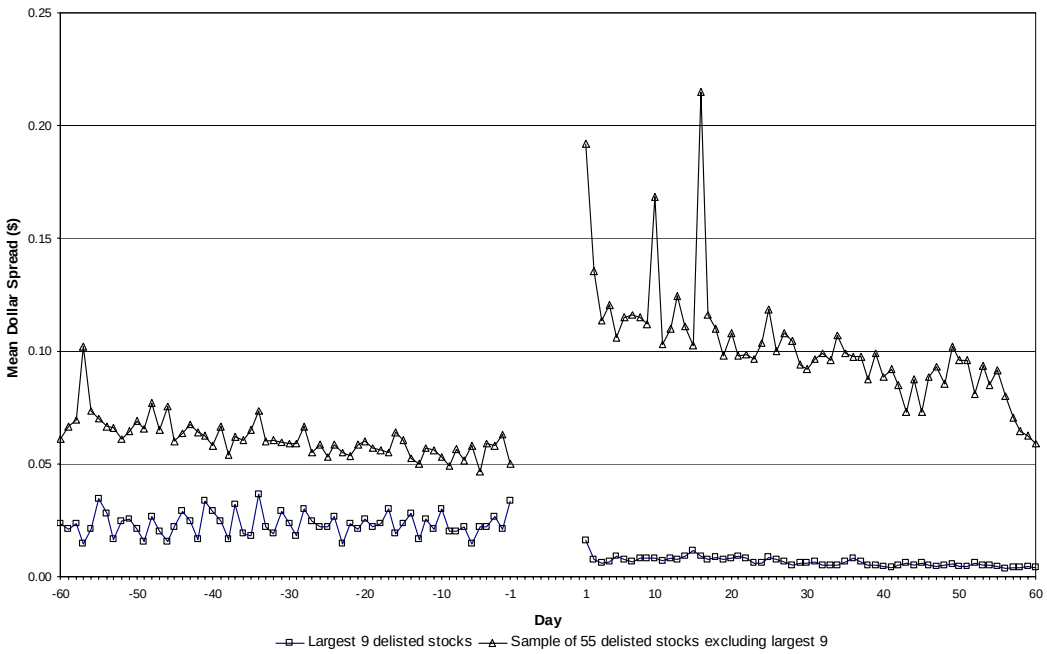
The figure plots the value over time of two equally weighted portfolios from the first day of trade on Pink Sheets to day 60. One portfolio comprises all 55 stocks in the sample of stocks delisted from NYSE in 2002 that went to Pink Sheets, the other comprises the largest 9 by market capitalization of those 55 stocks. Portfolios are formed by an equal allocation of $100 at closing prices on the first day of trade on Pink Sheets.

Figure 3
Average Percentage Spreads on NYSE and Pink Sheets



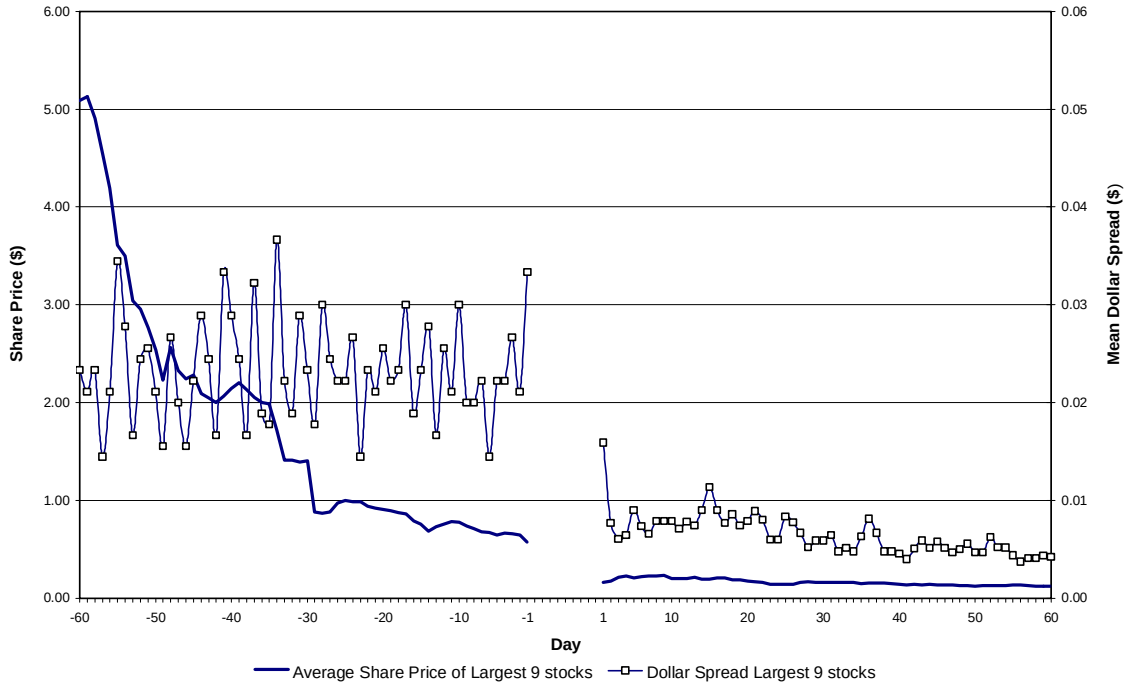
The graph plots the mean percentage spread over time of two samples of stocks that were delisted from NYSE and subsequently traded on Pink Sheets. One sample comprises the largest 9 by market capitalization of a sample of 55 stocks delisted from NYSE in 2002 that went to Pink Sheets, the other comprises 46 stocks being the sample of 55 stocks exlcuding the 9 largest stocks. Days [-60,-1] denote the last 60 full days of NYSE trading prior to the NYSE delisting announcement date. Days [1,60] refer to the first 60 days of trading on Pink Sheets. Percentage spread is calculated as (closing ask price –closing bid price) / (midpoint of closing ask and bid prices)×100.

Figure 4
Average Dollar Spreads on NYSE and Pink Sheets



The figure plots the mean dollar spread over time of two samples of stocks that were delisted from NYSE and subsequently traded on Pink Sheets. One sample comprises the largest 9 by market capitalization of the sample of 55 stocks delisted from NYSE in 2002 that went to Pink Sheets, the other comprises 46 stocks being the sample of 55 stocks exlcuding the 9 largest stocks. Days [-60,-1] denote the last 60 full days of NYSE trading prior to the NYSE delisting announcement date. Days [1,60] refer to the first 60 days of trading on Pink Sheets. Dollar spread is defined as (closing ask price – closing bid price).

Figure 5
Average share price and Average Dollar spread of the largest 9 delisted stocks



The figure plots the mean dollar spread and average closing share price over time of the largest 9 stocks delisted from the NYSE in 2002 that subsequently traded on Pink Sheets. Days [-60,-1] denote the last 60 full days of NYSE trading prior to the NYSE delisting announcement date. Days [1,60] refer to the first 60 days of trading on Pink Sheets. The average share price is calculated as an equally weighted average of the closing share prices of the 9 stocks in the sample. Dollar spread is defined as (closing ask price – closing bid price).

Figure 6
Volume of trade on NYSE and Pink Sheets

The graph shows the mean volume in millions of shares traded per day over time of a sample of 55 stocks delisted from NYSE in 2002 that subsequently traded on Pink Sheets. Days [-90,-1] denote the last 90 full days of NYSE trading prior to the NYSE delisting announcement date. Days [1,60] refer to the first 60 days of trading on Pink Sheets.

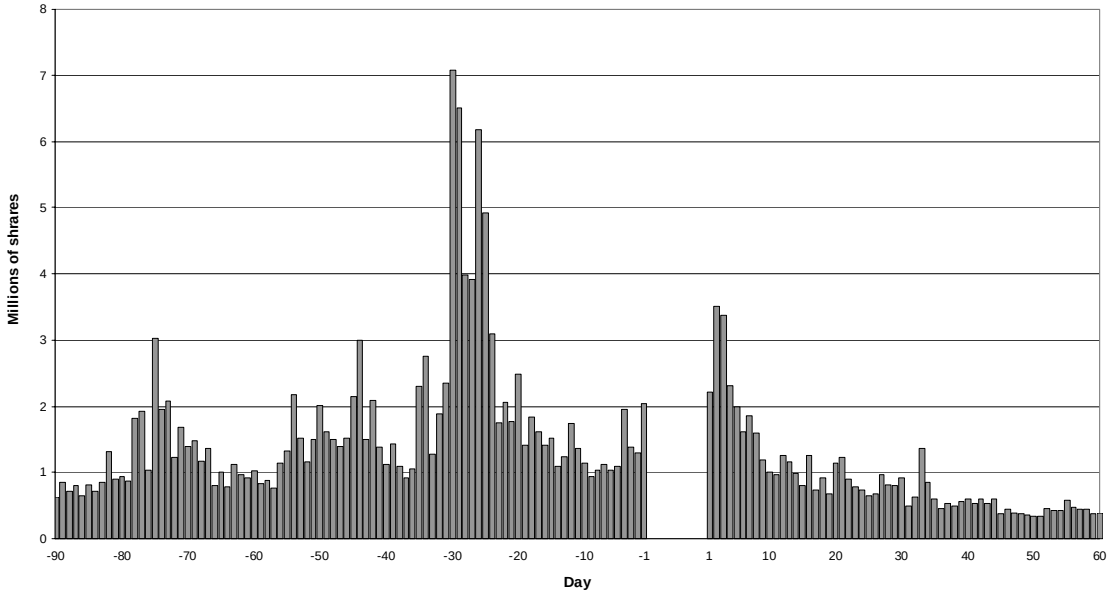
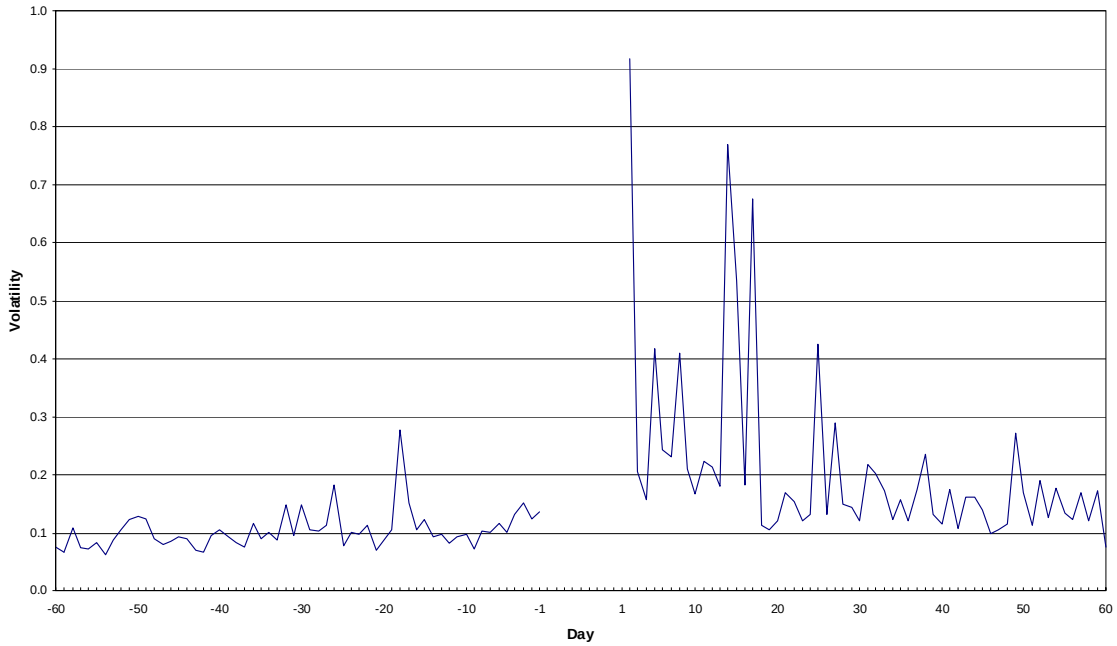


Figure 7
Volatility on NYSE and Pink Sheets



The graph plots volatility over time of a portfolio of 55 stocks that were delisted from NYSE in 2002 and subsequently traded on Pink Sheets. Volatility for a given day is calculated as the standard deviation of daily returns of the 55 stocks comprising the portfolio. Returns are calculated using closing prices. Days [-60,-1] denote the last 60 full days of NYSE trading prior to the NYSE delisting announcement date. Days [1,60] denote the first 60 days of trading on Pink Sheets. The first volatility estimate for Pink Sheets trading is on day 2.