

THE REGULATORY THREAT TO NASDAQ

A LEXECON REPORT

JANUARY, 1995

I. INTRODUCTION

Nasdaq, a dealer equity market which has enjoyed great competitive success against the New York Stock Exchange ("NYSE") and the American Stock Exchange ("AMEX"), is now threatened by hasty and ill-conceived regulatory actions which would limit its ability to compete.

As a dealer market, Nasdaq employs a different structure than the NYSE or AMEX, and has been affected particularly by a series of recent Securities and Exchange Commission ("SEC") actions. First, in March, 1995, the SEC overturned interim rules related to Nasdaq's Small Order Execution System ("SOES"). These interim rules had corrected a long-term problem, itself caused by regulatory interference, which raised trading costs for investors. The March decision has increased volatility and decreased liquidity among Nasdaq stocks. Second, as a result of intense SEC pressure, the NASD recently adopted rules which expand the role of customer limit orders on Nasdaq, a change which forces Nasdaq to imitate the NYSE and AMEX.¹ Third, the SEC recently has proposed a set of rules which would inhibit the ability of dealers to engage in wholesale transactions, would expand the treatment of customer limit orders, and would impose ponderous and complex requirements on the handling of customer orders. While the latest SEC proposals apply to all U.S. equity markets, their potential effect on Nasdaq is particularly severe.²

1. Securities and Exchange Commission, 17 C.F.R. 240.

2. Securities and Exchange Commission, 17 CFR 240, Release No. 34-36310.

Taken as a whole, these regulatory initiatives tend to force all U.S. equity markets toward a bureaucratic conception of the "perfect" market. This mold looks a lot like the NYSE/AMEX.

Ironically, these "reforms" are targeted against the fastest growing and most competitively successful U.S. equity market. Corporations currently have a choice -- most small firms can choose between listing their shares on Nasdaq, which is a "dealer" market, or on the AMEX, which, like the NYSE, is an "auction" market. Large firms can also choose to list on the NYSE, providing a choice among three competing markets. For decades, Nasdaq has been winning this competition by growing at a rate far exceeding that of either the NYSE or AMEX. Instead of rewarding this competitive success, the proposed SEC actions would handicap Nasdaq and would reduce the choices available to investors and listing companies.

We have been retained by Herzog Heine Geduld ("Herzog") to analyze the current SEC proposals and the SEC actions related to the SOES system. This report consists of five sections. Following this introduction, Section II discusses the competitive success of Nasdaq in the U.S., and the success of similar dealer markets in other countries. Section III discusses problems related to the SOES system. Section IV analyzes the current SEC proposals, and Section V concludes.

II. DEALER MARKETS HAVE SUCCEEDED COMPETITIVELY

A. The Nasdaq, AMEX and NYSE Compete for Listings

Corporations seeking to list their shares in a U.S. equity market have three major alternatives, the NYSE, AMEX and Nasdaq markets. The NYSE and AMEX are auction markets, organized around monopolistic specialists who administer centralized customer limit order books and who accept the obligation to maintain an "orderly market" in return for their

monopoly status. In contrast, Nasdaq is organized as a dealer market, with competing market makers who post bids and offers for stocks. Dealer markets comprise many of the largest and most successful markets in the world, including the interbank foreign exchange market, the market for U.S. Treasury issues, and the London Stock Exchange, which is currently the world's second largest equity market.³

The choice between dealer and auction markets involves complex tradeoffs in liquidity for different types of stocks in different market conditions. Unlike NYSE specialists, Nasdaq dealers have no protection from competition. New dealers can enter and leave Nasdaq freely, and any of the more than 400 Nasdaq dealers can make a market in any Nasdaq stock on one day's notice.⁴ Nasdaq dealers post their bids and offers on an electronic quote screen, and execute the orders that they receive. Unlike auction markets, dealer markets do not maintain central limit order books, although they do have an obligation to post firm quotes.

Not all companies are eligible to list their shares on all three U.S. equity markets. The smallest companies may only qualify for Nasdaq's "small cap" listings. Medium-sized ("mid-cap") firms will qualify for both the AMEX and for the Nasdaq National Market System ("NMS"), which have similar listing requirements. Finally, the largest firms will qualify for NYSE, as well as for AMEX and the Nasdaq NMS.

B. Nasdaq Has Succeeded Competitively

Nasdaq has enjoyed stunning competitive success during the last decade, particularly over AMEX, the market against which it competes most directly. AMEX and the NMS

3. As measured by dollar volume in 1993.

4. Entry into the Nasdaq market and approval as a market maker in a stock are subject to routine capital and compliance requirements.

segment of Nasdaq both compete for mid-cap listings and have similar listing requirements, allowing medium-sized firms to choose between the dealer and auction formats. Yet, despite the fact that the two markets draw on the same pool of potential listings, the Nasdaq NMS has grown at a rate far exceeding the growth at AMEX. The NMS was established in 1982, and had 682 listings by the end of 1983, while the AMEX had 948 listings. By 1994, NMS listings had expanded by a factor of 450% to 3772, while the AMEX had grown by only about 4%, to 983 listings. Volume shows a similar trend, with Nasdaq NMS volume growing by about 1400%, while AMEX volume grew by little more than 100%. In only a decade, the Nasdaq NMS has come to dominate mid-cap equity trading.⁵ Figure 1 compares the average growth rates for AMEX and the NMS since 1983.

AMEX also competed briefly with Nasdaq for small-cap listings, by launching the Emerging Company Marketplace in 1992. However, the initiative failed and AMEX abandoned it in 1995. At the end of 1994, Nasdaq listed about 2000 small cap issues.

Nasdaq's success against the NYSE is harder to document, since the NYSE does not attempt to compete for most of the companies listed on Nasdaq. However, by 1994 we estimate that at least 670 Nasdaq stocks were eligible for listing on the NYSE, including some of the largest U.S. companies, such as Intel, Microsoft, MCI Communications, and Apple Computer.⁶ Furthermore, unlike the NYSE, which makes it almost impossible for a company

5. The AMEX statistics reported here exclude options, in which Nasdaq does not compete.

6. We make this estimate by examining four of the numerical standards suggested by NYSE for domestic companies: (1) average monthly trading volume; (2) number of publicly-held shares; (3) aggregate market value of publicly-held shares; (4) earnings before federal income taxes from 1991-1993. We did not look at total number of stockholders, because public data does not properly count individuals who hold in street name, nor did we consider any of the non-numerical standards ("degree of national interest in the company," etc.). Because we do not have data on the shares
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to delist, any Nasdaq stock is free to move to any competing market that will accept it.⁷ Thus almost 700 of the largest companies in the U.S. economy have chosen to stay on Nasdaq despite their eligibility for NYSE listing.

It is also important to note that the NYSE has chosen not to compete against Nasdaq for smaller company listings. If its members believed that their specialist-based auction market could compete successfully for less liquid stocks, the NYSE could open its doors to thousands of these companies. Instead, the NYSE has chosen to confine its activity to only the largest stocks. As a result of this strategy and the natural competitive advantages of dealer markets, the NYSE has shown lower growth than Nasdaq over the past two decades, as illustrated by Figure 2. Figure 3 shows the overall growth of listings in the three markets since 1973.

C. The London Stock Exchange

The success of the London Stock Exchange (LSE) also demonstrates the advantages of dealer markets over auction markets. The "new" LSE was created in 1986 as a close copy of Nasdaq, and has grown into the second largest stock exchange in the world. The LSE also represents a major threat to traditional European markets. As illustrated by Figure 4, in 1993 the LSE derived almost half of its volume from trading in non-U.K. equity. By comparison, the equity markets in France and Germany both obtained less than 3% of their volume from non-domestic stocks. Figure 5 shows that in 1993 the LSE accounted for almost one third of

6. (...continued)

held by insiders, the number of publicly-held shares is assumed to be 50% of the total number of shares outstanding. If public holdings are larger than 50% for the larger Nasdaq firms, then even more of these firms would qualify for NYSE listing.

7. NYSE Rule 500 requires a delisting company to obtain a majority approval by its shareholders. In practical terms, this requirement prevents exit.

trading in French stocks, and over 10 percent of trading in Swiss, Spanish and German stocks. As a response to the threat posed by the LSE, both a French consortium and the European Association of Securities Dealers have announced plans to open dealer equity markets closely patterned on Nasdaq. (The EASD proposal is currently known as Easdaq.)

In market economies, high cost, inefficient competitors will lose ground to their rivals. The success of dealer markets in both the U.S. and Europe provides powerful evidence of their efficiency, and casts doubt on policies that would "reform" Nasdaq to look more like its specialist-based rivals.

III. REGULATION OF THE SOES SYSTEM

Nasdaq dealers face a requirement unlike that faced by market makers anywhere else in the world -- they must submit firm bids and offers for substantial quantities of shares, which are then subject to automatic execution at the stated prices.⁸ This regulatory requirement allows professional traders to "pick off" market makers who do not adjust their prices rapidly enough, and forces dealers to abandon stocks, and to increase the volatility of their quotes in their remaining stocks, in order to avoid losing large amounts of money. This artificial, regulation-induced trading activity decreases liquidity, raises trading costs and harms the investors that SOES was intended to benefit.

8. The NYSE Super-DOT system requires specialist consent before trades are executed. For active options, the CBOE RAES system executes trades at the current bid or offer as determined in the trading pit and instantaneously entered by the exchange, thereby ensuring that executions always occur at fresh prices. Less active options are updated using the "Autoquote" system, based on the price of related strikes and of the underlying stock. Finally, CBOE reserves the right to adjust RAES trades that occur at "unfair" prices.

A. History of the Problem

Nasdaq's Small Order Execution System was originally introduced in 1984 to provide the advantages of automated trading to small customers, especially customers of brokers that had not already invested in order routing systems. Participation in the original SOES system was voluntary.

Following the stock market contraction of October 1987, Nasdaq, along with all other U.S. equity markets, implemented reforms intended to correct deficiencies that had surfaced under severe stress. As one of its reforms, Nasdaq required market makers to participate on SOES for all stocks in which they make a market, and established minimum exposure levels.

However, mandatory participation created further problems. In August 1988, within months of the implementation of mandatory SOES participation, the Nasdaq filed the first of many rule proposals intended to address a new and costly development -- the advent of professional traders who used computers to "pick off" market makers when they failed to adjust their SOES quotes quickly enough as market prices changed. These traders took advantage of the large minimum exposure sizes on SOES by hitting the SOES order entry key repeatedly, executing rapid trades for thousands of shares against market makers who had not yet updated their quotes. These trades would not have been possible on the conventional Nasdaq system, where dealers face much smaller minimum exposure levels, and have the right to refuse a trade if they have already traded and are in the process of updating their quote.

Because Nasdaq dealers frequently make markets in hundreds or even thousands of stocks, they cannot hire enough traders to provide immediate updates for all quotes without vastly increasing their costs. Since labor is a major component of market making costs, higher labor costs would translate into wider spreads and higher costs for customers. In

response to this problem, Nasdaq has filed a long series of rule proposals aimed at limiting SOES usage by professional short-term traders. After years of legal and regulatory delay, rule changes implemented in January of 1994 finally curtailed such trading by sharply reducing the maximum size of SOES trades, limiting the total mandatory exposure of market makers, and prohibiting the use of SOES for short selling. However, these interim rules lapsed on March 28, 1995, when the SEC refused to extend them, and professional SOES trading has since resumed with a vengeance. Figure 6 shows SOES volume as a percent of Nasdaq share volume before, during and after the interim rules.

B. Artificial Trading Opportunities

Professional SOES traders, sometimes called SOES activists (or more colorfully, SOES bandits), portray themselves as "arbitrageurs," who keep prices in line and eliminate stale quotes. Economists generally view such activity as beneficial, when it takes place among voluntary participants. However, professional SOES trading exploits an artificial opportunity created by regulation, and thereby makes the market less, not more, efficient.

We expect participants in a free and unrestricted market to minimize the costs of keeping prices in line. For example, London foreign exchange dealers invest in quotation screens and adjust their quotes to reflect developments in New York. We also note that freely organized dealer markets do not require market makers to post firm quotes in large minimum sizes. In practice, most dealer quotes are "indicative," so that a dealer who received a phone call just as prices moved, and before he had entered a new quote on the screen, is allowed to say "Sorry, I just changed my quote," thereby preventing SOES-style arbitrage.⁹ Unregulated

9. We are aware of practices in the foreign exchange markets, the U.S. Treasury Bond market, and the forward market in Brent Crude, and we believe that posted dealer
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markets use indicative quotes in order to avoid the economic costs of an "arms race" between dealers and arbitrageurs, each investing resources to move faster than the other.

Government intervention always has the potential to distort private, profit-seeking behavior and to cause inefficient investment and resource allocation.¹⁰ Nasdaq dealers have been required to participate in an automatic execution system which forces them to trade even while they are adjusting their quotes, and which mandates the minimum trade sizes and the minimum number of trades which a dealer must agree to execute. In such an environment, momentary delays in quote adjustment can lead to large wealth transfers from dealers to SOES activists.

Deprived of the structural response adopted by unconstrained markets (for example, use of indicative quotes and limitation on the duration and size of binding quotes), Nasdaq dealers have been forced to adopt more costly defense strategies. We believe that the SOES rules have increased the volatility of Nasdaq spreads and decreased the liquidity available in many Nasdaq stocks, as dealers are forced to adjust their quotes rapidly in response to changes in order flow. We also believe that the SOES rules have probably caused dealers to over-invest in traders to ensure rapid responses to price changes. The SOES rules have also caused excessive investment in traders and technology by the SOES traders, as they compete for the profits or "rents" created by government regulation.

9.(...continued)

quotes on these markets are generally indicative of a willingness to trade, but are not binding. Even on automated systems, such as Reuters Dealing 2000, dealers generally post quotes in response to a "request for quote," and such quotes remain valid for only a short time.

10. For example, federal ceilings on bank deposit interest rates during the 1970's led banks to use "service competition" to attract underpriced deposits, leading to construction of unnecessary branches, and to the use of gifts and prizes to attract deposits. Without government-induced distortion, market forces would not put banks in the business of selling toasters.

Professional SOES trading activity does not improve the prices available to small traders. Because Nasdaq offers a centralized market, traders can always be assured of getting the best price available in the market. Professional traders who take existing offers as soon as prices begin to rise merely exploit attractive quotes that might otherwise go to small investors.

D. Evidence that SOES Trading Decreases Liquidity

The SEC's refusal to extend the interim SOES rules beyond March 28, 1995 offers one advantage -- it provides a clean "before and after" test of the effect of SOES trading on Nasdaq liquidity.

The evidence suggests that Nasdaq dealers have adopted two strategies to cope with SOES trading. First, many dealers have decreased the number of stocks in which they make markets. Second, dealers appear to have increased the frequency and size of their quote changes in response to trading activity. Both these strategies are likely to reduce liquidity and increase costs for customers.

To demonstrate the effect of SOES on Nasdaq volatility, we selected a sample of the 50 Nasdaq stocks with the highest percentage of SOES trading volume in April and May 1995, and a control sample of 50 stocks with the lowest percentage of SOES volume during the same time period. We then looked at changes in volatility and market maker participation for these stocks from January 1, 1995 to May 31, 1995 for both samples.

Figure 7 shows the average change in volatility for the two samples.¹¹ While volatility falls for the sample with low SOES usage, volatility actually rises substantially for the sample with high SOES activity.¹²

We also investigate the change in the number of market makers participating in each stock before and after March 28. As illustrated by Figure 8, market maker participation for the low SOES sample neither increased nor decreased overall, with about half the stocks experiencing increases and half experiencing decreases during the four month period following March 28. In contrast, Figure 9 shows that over 70 percent of the high SOES stocks lost market makers during this period, for a total decline of 181 market makers, and only four stocks actually gained dealers.

These results complement results reported by the Nasdaq Economic Research group, which found that the 50 stocks with the largest declines in the number of participating market makers between April 3, 1995 and July 20, 1995 had average SOES volume equal to about 12% of their total volume in June and July, 1995. This SOES activity was almost twice the average for stocks on the National Market system. In contrast, the 50 stocks with the largest absolute increases in the number of participating market makers showed average SOES volume of only about 3%.

11. We measure volatility as the average of the daily high minus the daily low, divided by the daily low, for each stock.

12. This result can have several interpretations. First, it could occur because SOES activity causes higher volatility. Second, it could occur because of an "industry effect," because the stocks in the high SOES sample tend to be more heavily concentrated in the computer and electronics industries than are the low SOES firms. These industries may have coincidentally become more volatile after March 28, 1995. Third, SOES activity may occur because stocks are volatile, rather than the reverse. Evaluation of these issues lies beyond the scope of this paper.

These results suggest that professional SOES trading may have increased the volatility of Nasdaq stocks, and provide strong evidence that such trading has decreased Nasdaq liquidity by decreasing market maker participation.¹³

IV. SEC PROPOSALS

In addition to rolling back Nasdaq modifications to the SOES system, the SEC has also proposed a number of profound structural changes to Nasdaq. The SEC proposals, which are included as Appendix A, would, among other changes, require market makers to make public any quotes that they post on private electronic communications systems, require market makers to display all customers limit orders, and, finally require market makers to provide "price improvement" opportunities for customer orders.

A. Publication of Private Quotes

Nasdaq dealers currently trade among themselves and with large institutional customers over two private trading systems, SelectNet and Instinet. These systems provide a form of wholesale market where dealers can negotiate private transactions, which they need not disclose until after execution. The current SEC proposals would require that dealers offer their "wholesale" prices in the retail market.

13. The detrimental effect of professional SOES trading on investors and on listing firms can also be seen from the reactions of individual listing corporations. For example, Delta & Pine Land Co. recently announced plans to move to the NYSE, stating that SOES activity had caused five of the firm's eight Nasdaq market makers to abandon the stock, reducing its liquidity and causing concern to the firm's institutional investors.

Antitrust economists have long understood that rules restricting private dealing tend to diminish competition by reducing the incentive for suppliers to cut their prices.¹⁴ Because large orders generally benefit from economies of scale, large customers in most industries can negotiate lower prices than small customers. A rule requiring suppliers to offer the same price for all customers will discourage dealers from offering low prices to large customers, thereby enabling dealers, rather than customers, to capture the cost-saving benefits of large orders.

Elimination of wholesale pricing by regulatory fiat would represent a radical and unthinkable policy in most industries. Although the SEC has a statutory requirement to consider the competitive implications of its actions, its current proposal spends less than one page on this subject.¹⁵ We do not believe that the Commission has adequately evaluated the competitive implications of this rule.

B. Publication of Limit Orders

The current SEC proposal requiring dealers to publicly display customer limit orders overlaps with a recently implemented Nasdaq rule, as well as with a pending Nasdaq proposal. As of June 1995, Nasdaq already requires dealers to give priority to customer limit orders. In addition, the NASD has proposed a new small order execution system that would include a centralized limit order book for orders of less than 1,000 shares.¹⁶ The SEC proposal enlarges the Nasdaq initiatives, primarily by requiring that dealers immediately

14. Steven Salop, 1986, "Practices that (Credibly) Facilitate Oligopoly Coordination," in Joseph E. Stiglitz and G. Frank Mathewson, eds., New Developments in the Analysis of Market Structure. Cambridge, Mass.: The MIT Press, Chap. 9, 265-90.

15. Securities and Exchange Commission, 17 CFR 240, Release No. 34-36310, pp. 74-75.

16. Orders up to 3,000 shares would be included for stocks in the "Nasdaq 100."

modify their own quotes to display customer limit orders, and by including orders of up to 10,000 shares.

The Nasdaq proposals, which were themselves adopted under strong SEC pressure, already represent a substantial abandonment of the highly successful dealer market concept. However, at least the Nasdaq proposal allows an experiment which exposes limit orders of only 1,000 shares or less. Given the success of dealer markets, we believe that Nasdaq's slower approach to this issue makes sense.

C. Price Improvement

Finally, the SEC has proposed a rule requiring that customer market orders be exposed for "price improvement" before execution. The Commission proposes a safe harbor in which market makers would stop the order at the current bid (for a sell order) or at the ask (for a buy), and would expose the order at one minimum price variation better than the stop for 30 seconds before executing it at the stop.

The proposal includes numerous exceptions and special cases, including that it would apply only to the 250 Nasdaq stocks with the highest volume over the last quarter; that it would apply only when the inside spread exceeded one tick but was less than five ticks; that it would not apply when the exposure of another order had temporarily reduced the inside spread to one tick; that the exposure period for a given order would end when the market maker received another order requiring exposure on the same side of the market or when another market maker executed an order at the stop price; that the exposure period would end when the market moved away from the stop price; that it would not apply to block trades or to trades outside the best bid and offer; that it would not apply to odd lot orders or to orders

received within five minutes of the open or close; and that it would not apply during fast markets.

This proposal seems extraordinarily ill-conceived. The exposure of every market order, combined with the previously required exposure of customer limit orders, would flood the Nasdaq market making screens with rapidly changing and almost useless information. The proposal is designed to apply only to actively traded stocks, yet would offer customers little improvement in such stocks, since their orders would be exposed only until another order arrived at the dealer or until a trade occurred at the stop price. Furthermore, since much Nasdaq trading takes place by telephone, traders would have very little chance of actually trading against an exposed order. And a trader who did enter an order to trade against, for example, an exposed 5,000 share market order could easily find that the target order had been replaced by a 100 share order arriving seconds later.

In addition, customers and regulators would find it almost impossible to enforce the proposed rules, since enforcement would require a split-second, detailed and synchronized audit trail not only of trades, but also of order arrivals and exposures. The inherent limitations and time lags of computerized information systems, combined with the fact that many steps in the Nasdaq trading process are not computerized, makes creation of such an audit trail very difficult.

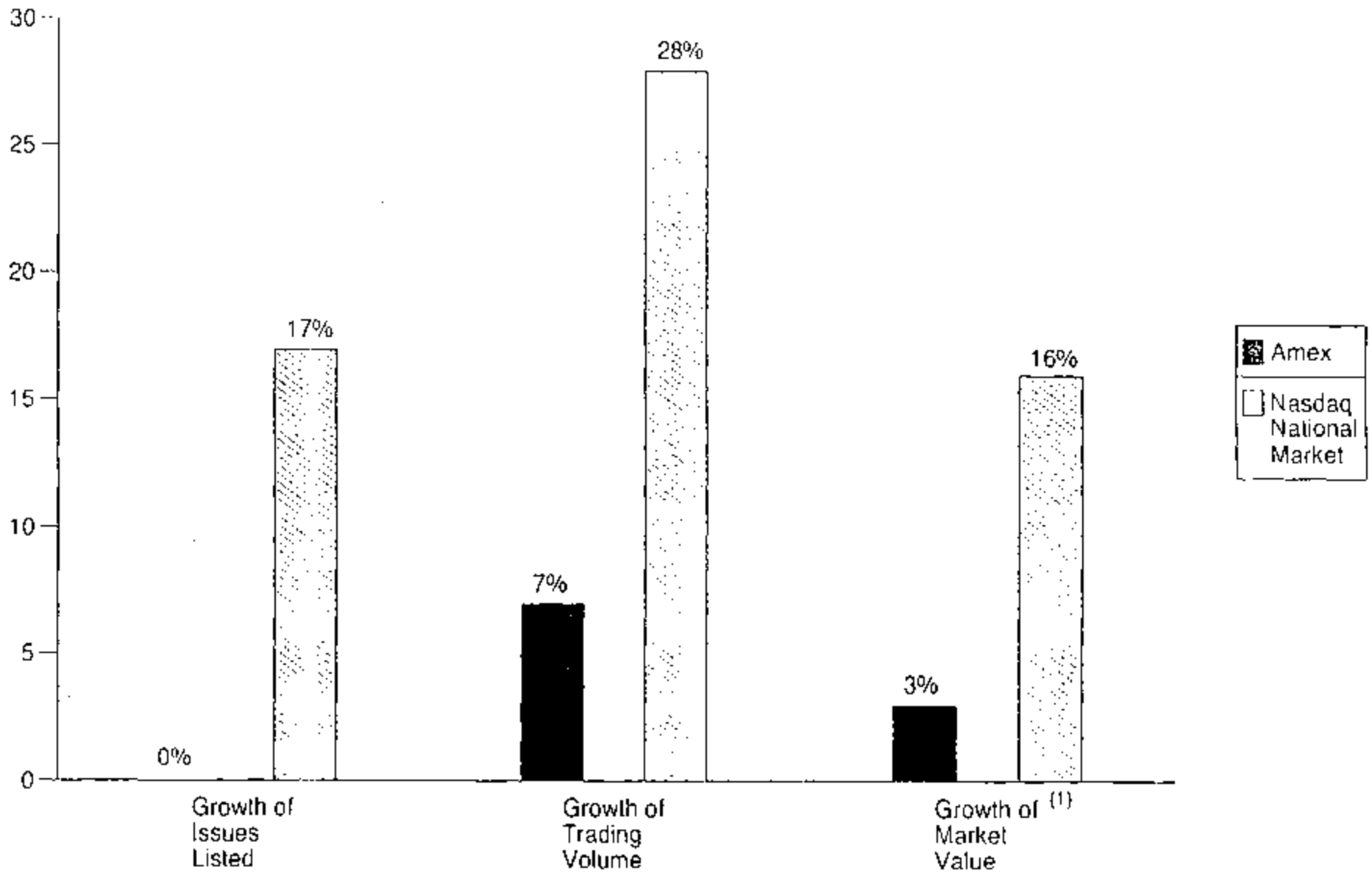
In summary, the SEC proposal for price "improvement" would impose a vast, complex, untried and unworkable set of requirements on Nasdaq participants, in pursuit of unproven gains.

V. SUMMARY

Competitive market systems follow a Darwinian process -- institutions that offer customers a good combination of price and service will succeed, while those that do not will fail. The Nasdaq market has demonstrated through competitive success that it offers investors and listing firms what they want. In contrast, regulatory decision making does not necessarily generate economically beneficial results, as demonstrated by the problems created by the SOES rules.

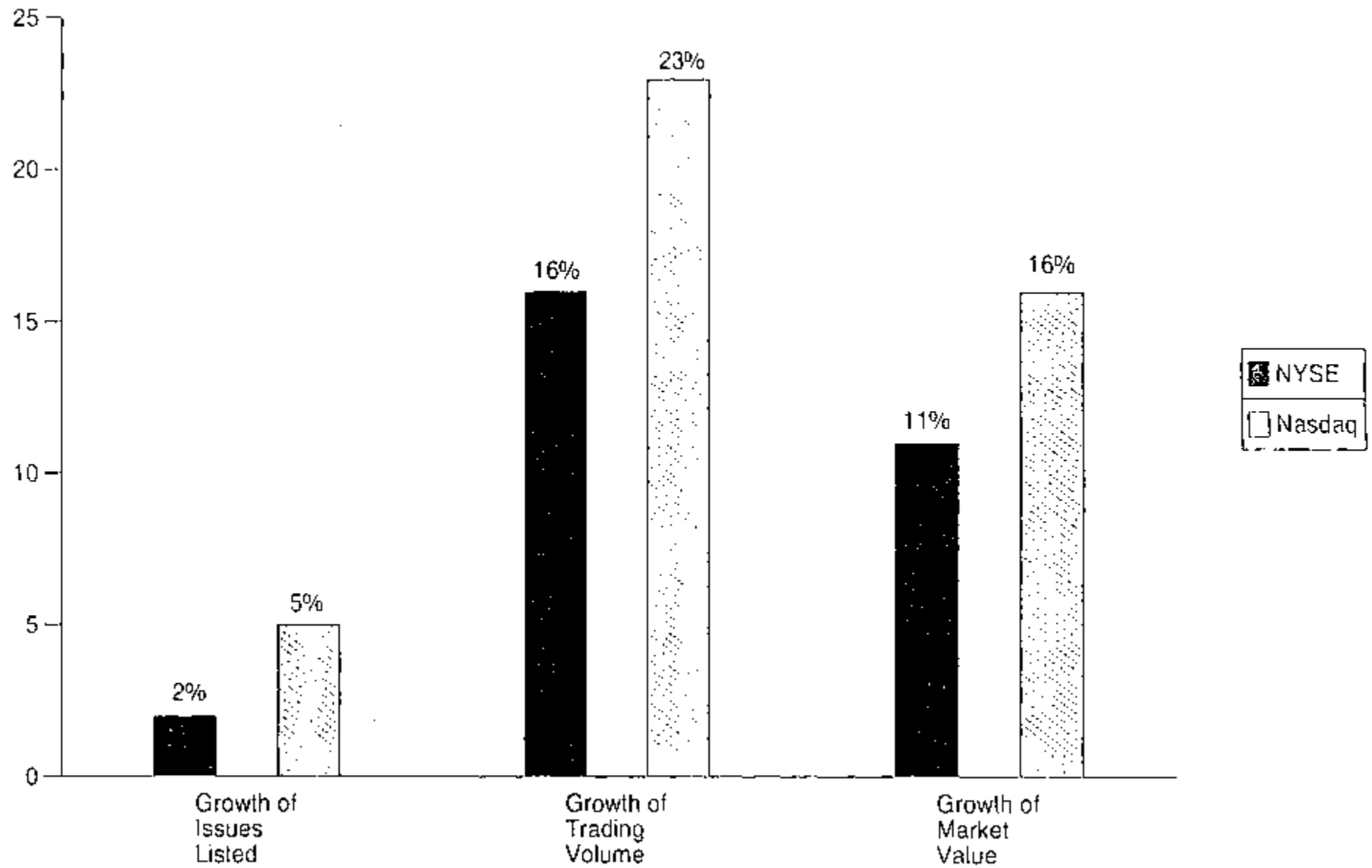
Despite Nasdaq's success, the SEC has chosen to overrule the market's verdict by imposing radical and inefficient rule changes, while blocking efforts to correct past mistakes. We believe that the SEC should correct its past errors and should proceed slowly and carefully on future changes. It should avoid policies that force market winners to imitate market losers.

Figure 1
Annual Growth Rates
Nasdaq National Market Versus Amex
1983 - 1994



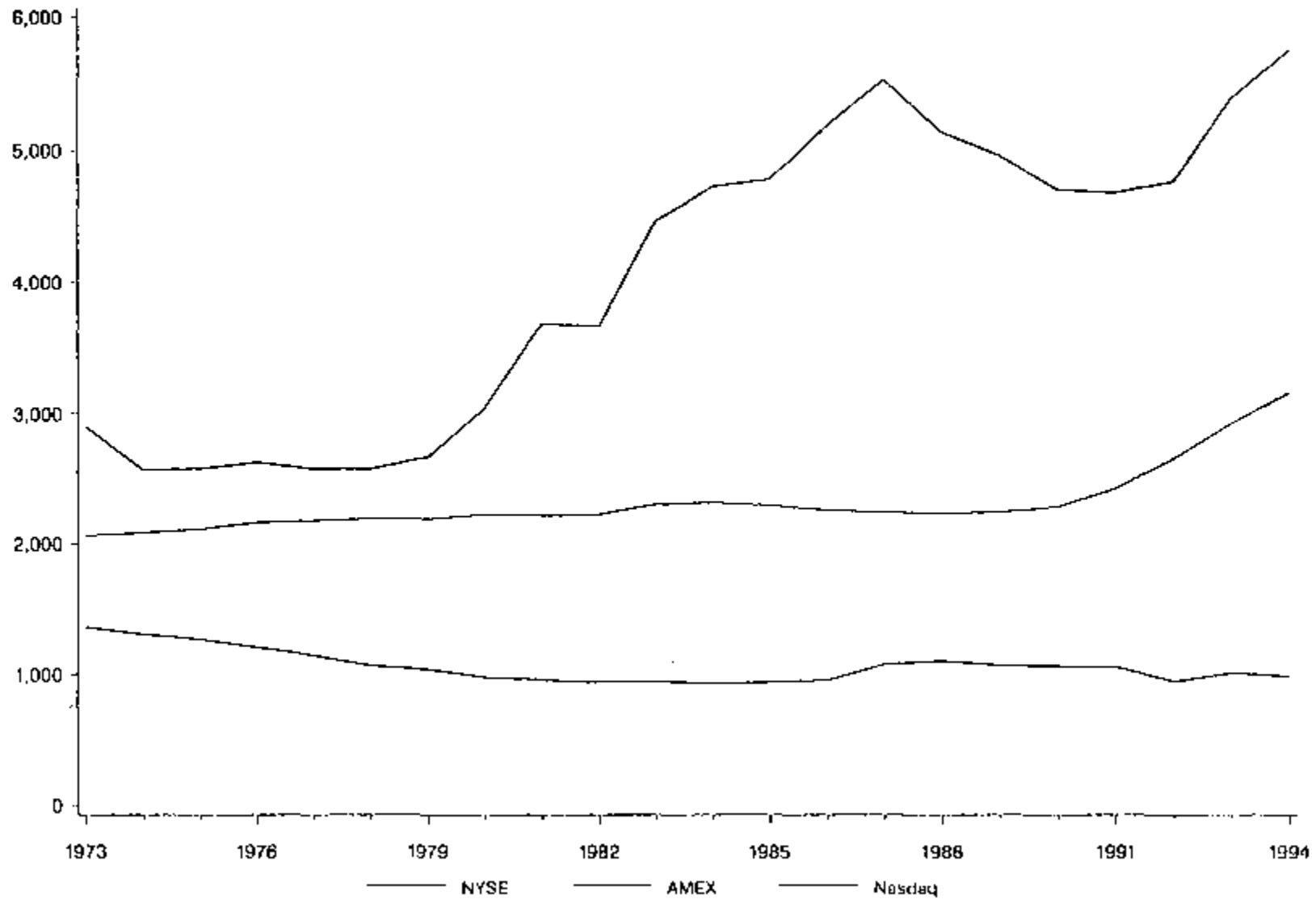
(1) Market value data only available from 1989 to 1994.
Source: Nasdaq, Amex.

Figure 2
Average Growth Rates
Nasdaq Versus NYSE
1978 - 1994



Source: Nasdaq, NYSE.

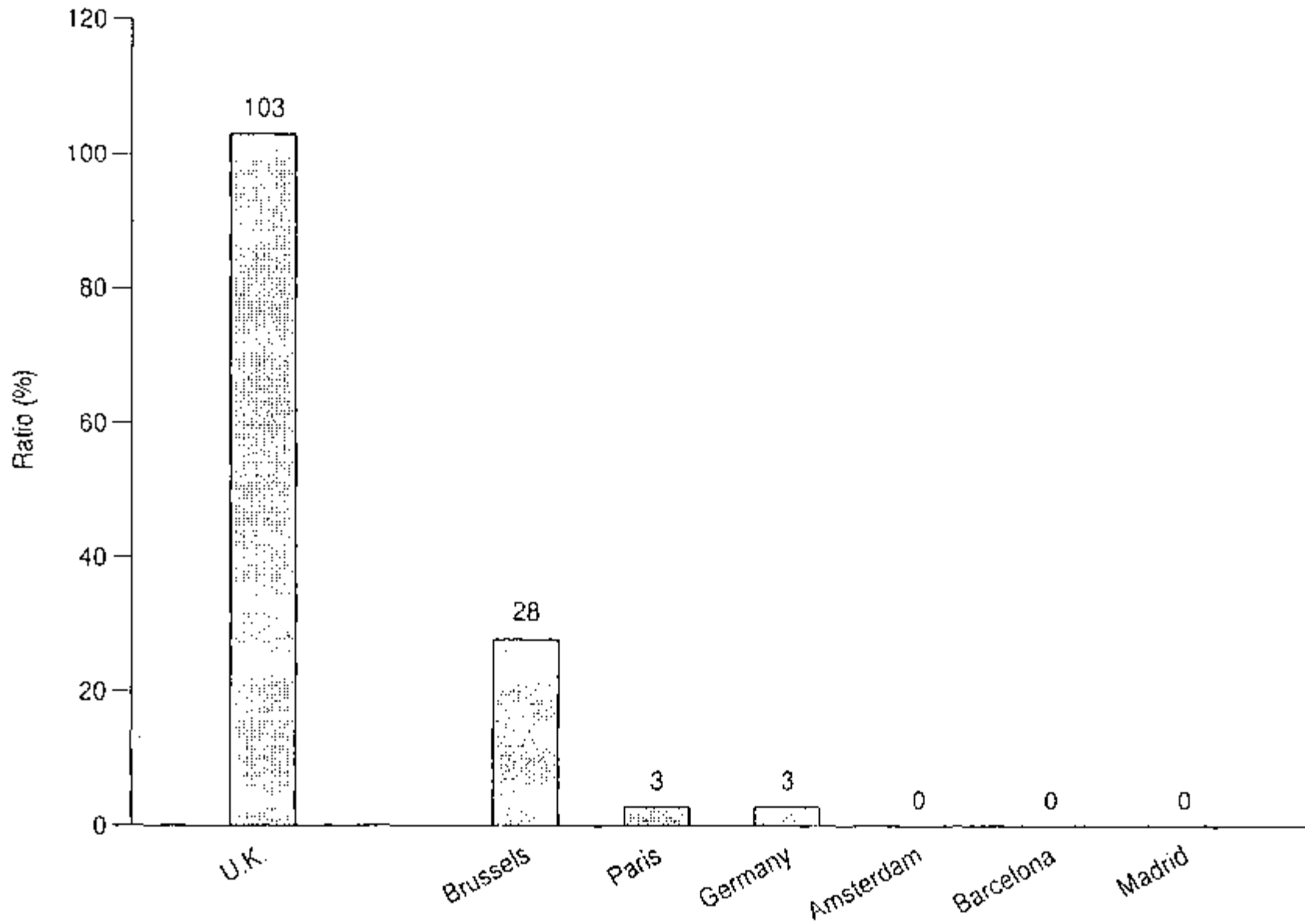
Figure 3
**Comparison of NYSE, AMEX, and Nasdaq
Number of Issues Listed
1973 - 1994**



Source: Nasdaq.

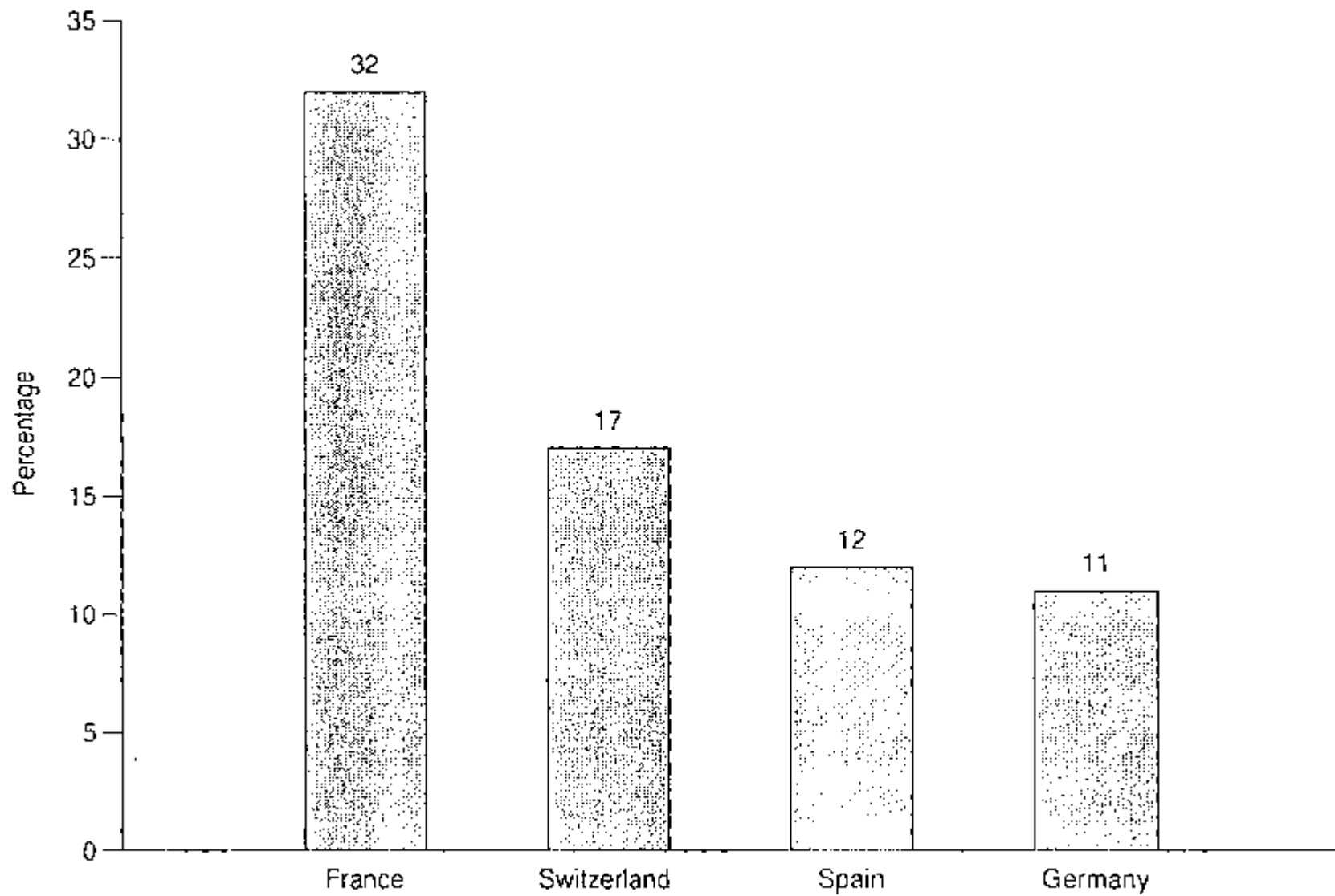
Figure 4

Comparison of London Stock Exchange to Other European Exchanges Ratio of Foreign Equity Volume to Domestic Equity Volume 1993



Source: London Stock Exchange.

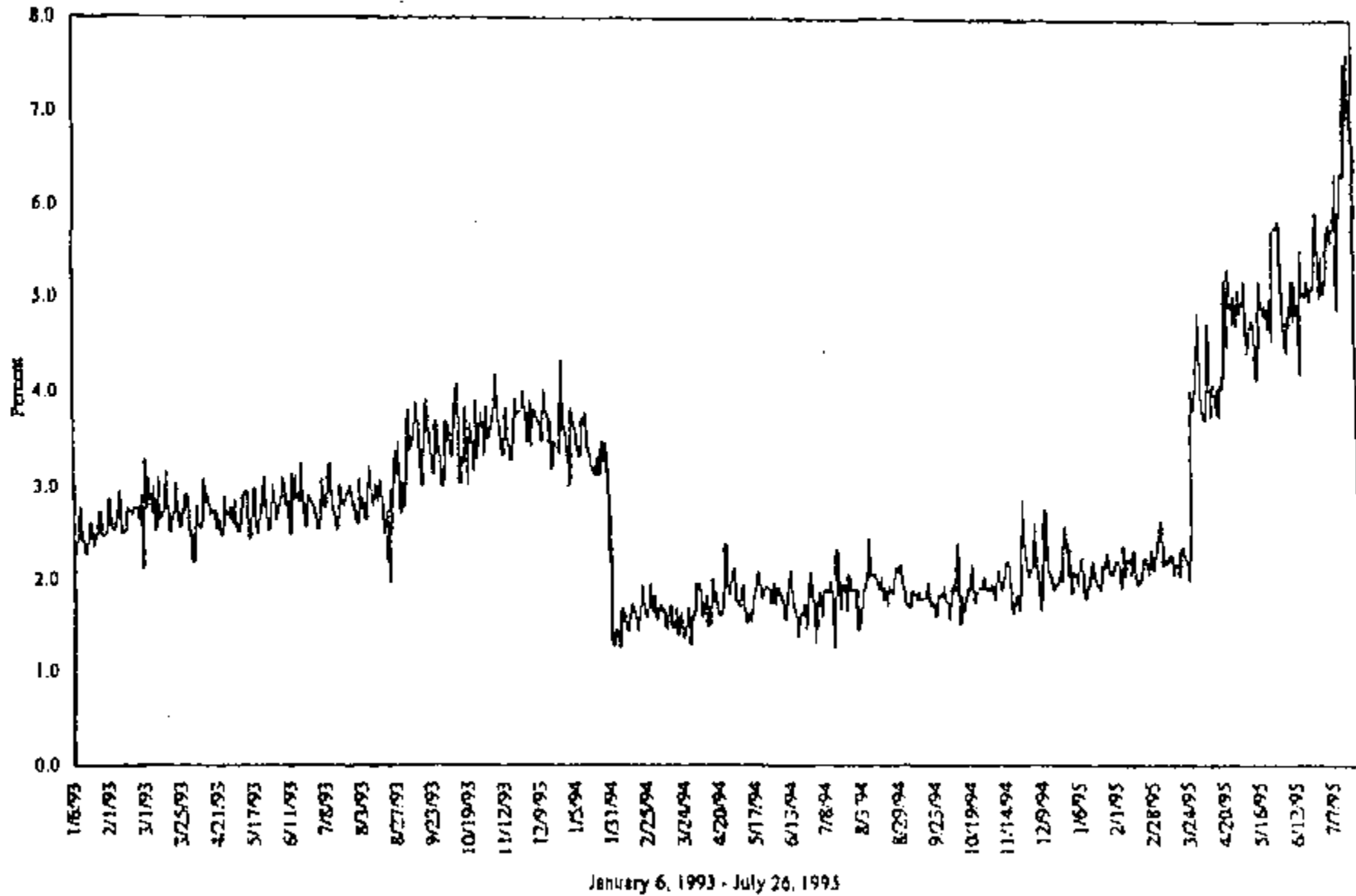
Figure 5
Percentage of Foreign Country Volume Traded on LSE
1993



Source: Based on numbers supplied by the London Stock Exchange. May not include all sources of volume

Figure 6

SOES SHARE VOLUME AS A PERCENT OF NASDAQ SHARE VOLUME
(Volume-Weighted Across All Nasdaq Stocks)

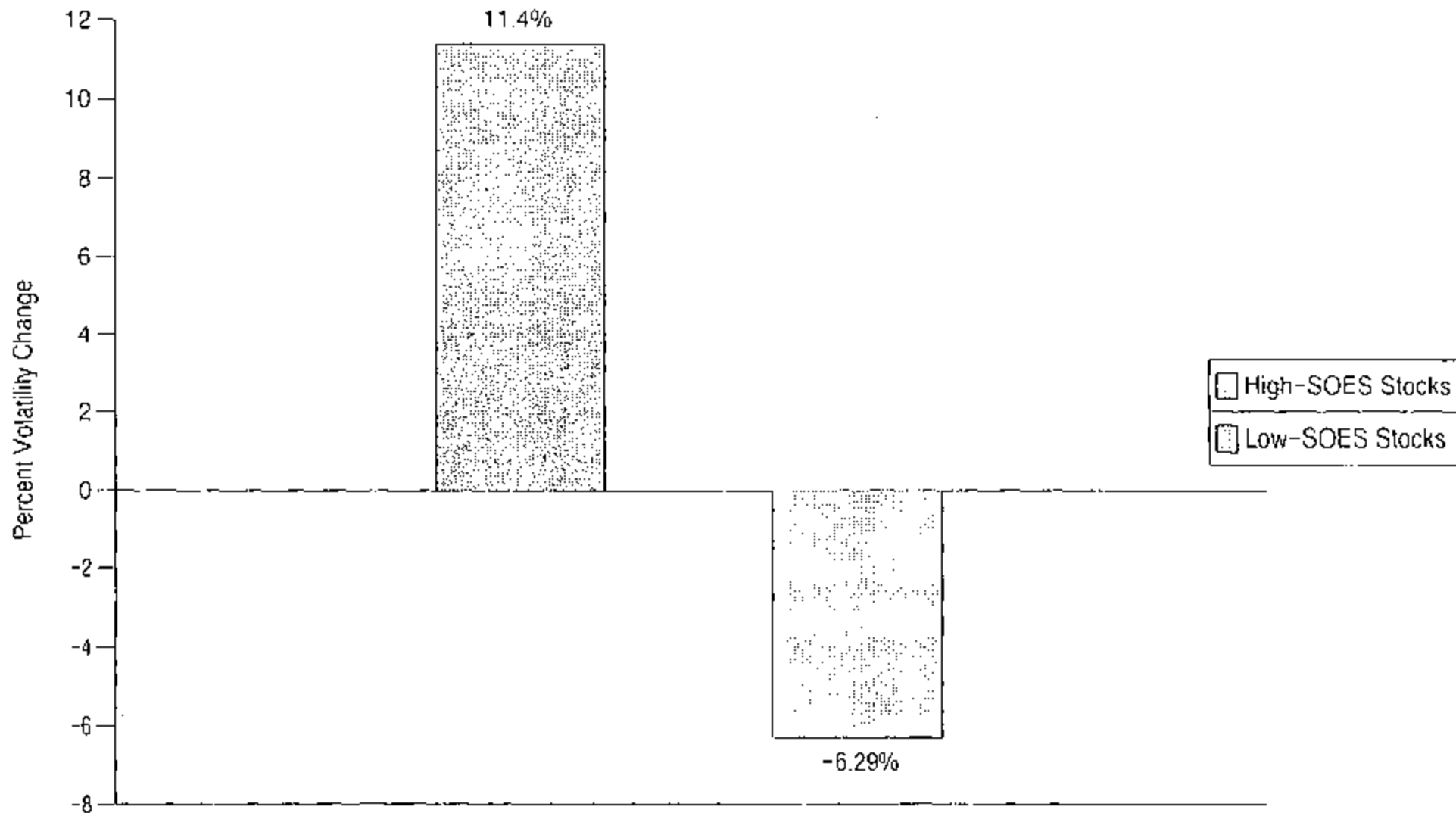


The initial SOES rules were implemented on January 31, 1994 and expired prior to March 27, 1995.

Source: Moxing Economic Research

Figure 7

Percent Change In Volatility After March 1995 Change In SOES Rules



Source: CRSP, HHG.

Note: Volatility is calculated as percent difference between the highest and lowest daily offer quote. The average volatility is then calculated for the Jan - Feb period and the April-May period. The percent difference between the two figures is calculated.

Figure 8
Change in the Number of Market Makers
For Securities with Low Volumes in the SOES Trading System
March 27, 1995 to October 2, 1995

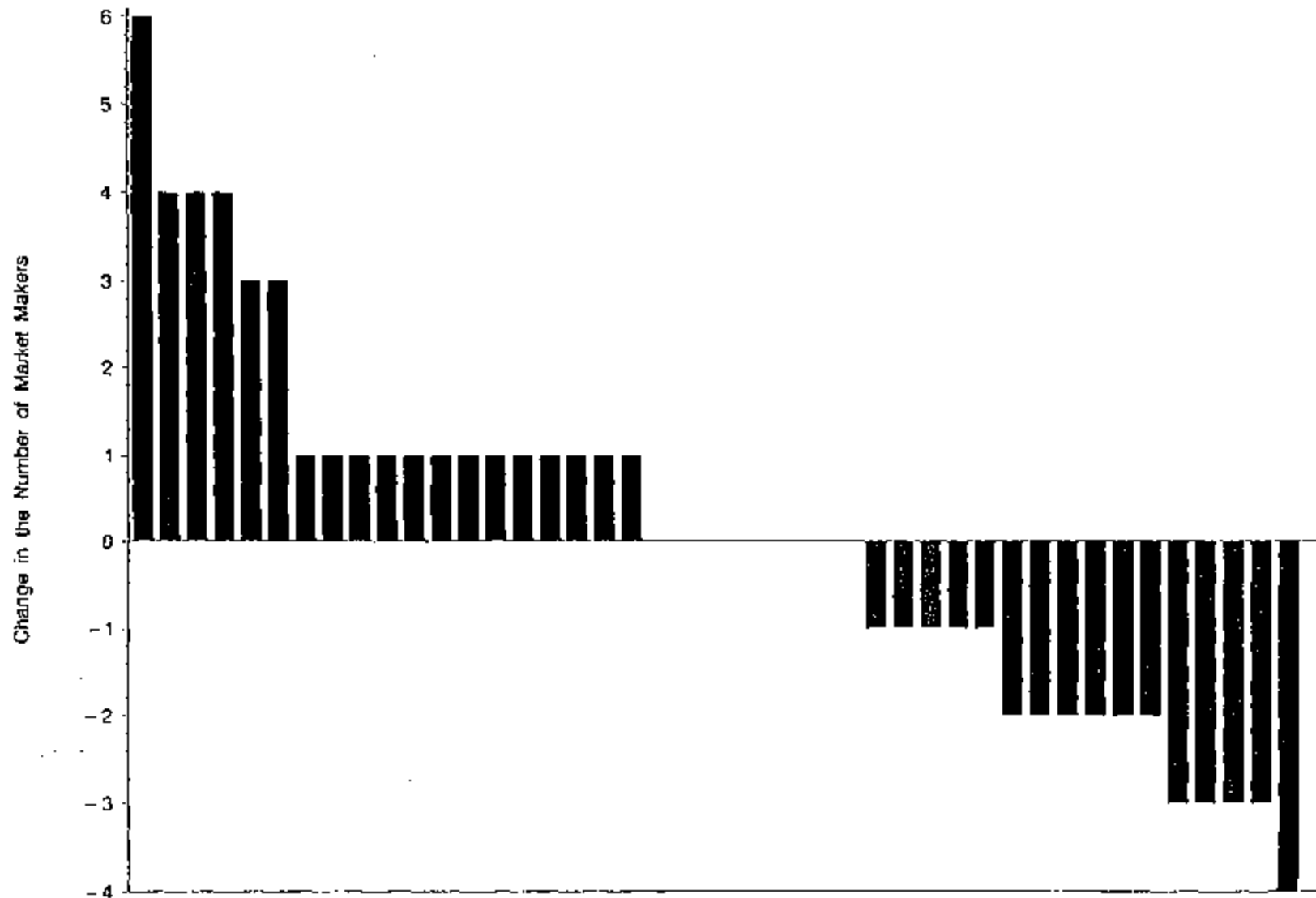


Figure 9
Change in the Number of Market Makers
For Securities with High Volumes in the SOES Trading System
March 27, 1995 to October 2, 1995

