Prepared Testimony of

Lawrence E. Harris, Ph.D., CFA
Fred V. Keenan Chair in Finance
USC Marshall School of Business

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I. Introduction

My name is Larry Harris. I am a professor of finance and business economics at the USC Marshall School of Business where I hold the Fred Keenan Chair in Finance. I formerly served as Chief Economist of the Securities and Exchange Commission where, among many other activities, I contributed substantially to the specification of SEC Regulation NMS. I have written extensively on the economics of exchange markets. I am the author of *Trading and Exchanges: Market Microstructure for Practitioners* (Oxford University Press, 2003), which has become the standard introduction to financial market structure for both university students and market practitioners. I am also a director of Interactive Brokers, Inc., a NASDAQ-listed broker-dealer that operations in electronic exchange markets throughout the workd, and of the Clipper Fund, Inc., a large cap equity mutual fund.

This written testimony and my oral comments today represent my opinions only and in particular do not necessarily represent the views of the University of Southern California, Interactive Brokers, Inc., or the Clipper Fund, Inc.; or of any of their associated personnel.

II. Summary

We are gathered today in large part to discuss the proposed merger between NYSE Euronext and Deutsche Börse. If completed, the combined firm would become the world's largest exchange operator.

The proposed merger would decrease the costs of providing exchange services, but otherwise would have little effect on the existing competition among exchanges to provide exchange services for equities in the United States. The NYSE and its affiliates would continue to be subject to competition from numerous other exchanges and trading systems that presently operate in the US.

If desirable, these other competitors could merge with other strong providers of securities exchange services in Europe such as the London Stock Exchange, Turquoise, Chi-X, or BATS Europe to obtain many of the benefits that the NYSE Euronext and Deutsche Börse presumably hope to obtain from their merger.

The new entity would obtain some advantage over NASDAQ in the provision of listing services by becoming the world's biggest exchange services company. This advantage would not be a significant source of market power.

The proposed merger would result in greater concentration of control over European futures contract markets. These markets are already essentially uncontestable monopolies. Placing them under common control will not change the underlying economics, but some resulting cost efficiencies may benefit their customers. The combined entity would be better able to compete with OTC trading of derivative contracts.

The merger would also result in greater concentration of trading in U.S. exchange listed options. However, this market is relatively easy to enter. If entry does not become restricted, the increased concentration should not harm the public.

My most significant concerns about competition in the financial markets involve the vertical structure of futures contract markets where exchange services and clearing services are under common control. Although this issue is beyond the scope of these hearings, I note that the US exchange-traded options contract markets provide a very successful model for market structure. The public would benefit if our futures industry adopted it. Any such adoption would require regulatory intervention, which seems very unlikely in the current environment in which our futures markets generally operate quite well and without much public criticism.

III. Consolidation among Exchanges

Exchanges have been consolidating for more than a century, largely in response to the development of new communications and information processing technologies. The inventions of the telegraph and later the telephone allowed traders to learn about trading opportunities at distant exchanges and to communicate their intentions to floor traders working on remote exchange trading floors.

As these communications systems matured, those exchanges that had the most order flow attracted more orders because traders can most easily arrange trades where other traders trade. Exchanges merged to aggregate their order flows and thereby make their combined markets more attractive to traders. Those exchanges that did not grow generally failed. These mergers greatly reduced the costs of trading by allowing buyers to find sellers, and vice versa, more often without the intermediation of dealers and arbitrageurs.

Where the public commonly traded only with dealers, such as in the early NASDAQ markets, innovations in communication technologies lowered the costs to dealers of participating in dealer networks, and thereby attracted their participation.

Economists call the tendency for orders to attract more orders the "order flow externality." It is a network externality because the value to any participant of sending an order to an exchange increases with the number of participants using the exchange. Practitioners simply say that "liquidity attracts liquidity."

In the United States, the order flow externality eventually led to the consolidation of almost all trading in a given stock to one of the three primary listing exchanges at which the stock was, and generally continues to be, listed: The NYSE, Amex, or NASDAQ. Some trading took place in regional exchanges and in dealer markets, but for the most part, traders chose to route their orders to the primary exchanges because only there could they easily obtain the best prices.

The order flow externality gave these primary exchanges market shares in excess of 80 percent despite customer dissatisfaction with the generally low quality services they received and the high fees that they paid. Innovative and cheaper exchanges could not attract order flow away from these incumbents because their markets simply were not liquid.

The development of high speed electronic trading systems changed this situation. These systems allowed traders to offer liquidity and to search for liquidity in multiple markets at the same time. Clever uses of these technologies greatly reduced the value of the order flow externality to the primary listing exchanges.

NASDAQ was the first primary listing market to lose substantial market share to new systems such as Island, Instinet, and Archipelago, which the SEC classified and regulated as Electronic Communications Networks (ECNs). These marketplaces could successfully compete against NASDAQ because NASDAQ operated a relatively fast electronic trading system in which the ECNs could post orders on behalf of their clients. ECN customers thus could benefit from liquidity at NASDAQ or at the ECN. The ability to participate simultaneously in both venues made the ECNs very attractive to traders, and ultimately led to very substantial market share losses at NASDAQ. This competition was successful against NASDAQ because NASDAQ's fast electronic trading system allowed the ECNs to cancel orders quickly when the ECNs could fill these orders in their own trading systems, and thereby avoid double jeopardy—filling the same order twice.

Competition from ECNs did not have a significant effect on NYSE or Amex market shares until the SEC adopted Regulation NMS. Before its adoption, these two floor-based exchanges could not—and often would not—cancel orders quickly enough to ensure that ECN orders would not be filled twice. The ECNs would have to wait up to 15 seconds or more to learn whether orders for which they requested cancellation had been canceled or executed. The floor-based exchanges were necessarily slow reporting the cancellations because floor traders often were negotiating trades or reporting trades for these orders when the order cancellation requests arrived. The slow floor-based NYSE and Amex exchanges thus retained their dominant positions in the face of ECN competition because traders could not effectively participate in ECNs and in these primary markets at the same time.

Regulation NMS changed this situation by reorienting the yield sign between floor-based and electronic trading systems. Before Reg NMS, no participant in the National Market System (NMS) could trade through—trade at a price inferior to—

any other NMS quote. This rule forced electronic trading systems to yield to slower floor-based trading systems. Following Reg NMS, no NMS participant could trade through any electronically accessible quote, but electronic systems could trade through slow floor-based quotes. The NYSE and Amex quickly adopted electronic trading systems to remain competitive. These systems allowed traders in the ECNs to interact with primary market liquidity as they had for NASDAQ. The NYSE and Amex market shares dropped as the above-mentioned ECNs, and new low cost ECNs such as BATS and Direct Edge, successfully competed with them, and in many cases, acquired enough native order flow to survive on their own.

The ability to instantly search for liquidity throughout the National Market System has now reduced the importance of the order flow externality so that multiple exchange systems are effectively competing with each other.

The maintenance of these electronic trading systems is expensive. Exchanges now are consolidating to reduce the costs of maintaining functionally similar trading systems. The costs of running nearly identical trading systems for two markets are not much higher than for running one system for one market. Thus, exchanges can decrease their IT costs substantially by merging. The reduction in the number of exchanges also reduces the costs that brokers must incur to connect to multiple exchanges. The Chicago Mercantile Exchange purchases of the NYMEX and Chicago Board of Trade were motivated in large part by their desire to decrease the combined costs of running the three exchanges.

IV. Expected Benefits of the NYSE Euronext—Deutsche Börse Merger

A primary benefit of the NYSE Euronext merger with the Deutsche Börse will be the reduction of duplicative IT costs. The combined firm will likely adopt a single technology platform for all of its markets, which would substantially reduce its development, maintenance, and operational costs. The merged firm undoubtedly also will provide a single data port for its brokerage and proprietary trading clients through which the clients could direct order flow to any of its exchanges. This facility would make trading through the combined firm more attractive to the brokers and proprietary traders that route orders to the exchanges.

A secondary benefit of the merger will be the creation of an entity that could easily consolidate trading in a given security across its markets, if the regulatory impediments to such consolidation are ever relaxed. Until then, the combined firm will simply be a holding company that will separately operate several different exchanges subject to various regulatory jurisdictions.

Some of these exchanges presently trade similar securities. For example, Siemens primarily trades at the Deutsche Börse, but it also trades at the NYSE as an American Depository Receipt (ADR). Many US stocks likewise trade in the European markets.

If regulators permitted exchanges to operate their trading systems in two or more regulatory jurisdictions at the same time, many exchanges would consolidate their order books into a single system so that a buyer in Europe could seamlessly trade with a seller in the US and vice versa. With the addition of one or more Asian markets, such an exchange could operate around the clock. The combined entity would enjoy the benefits of the order flow externality.

Presently, issues involving regulatory oversight, currency translation, and clearing and settlement complicate the consolidation of trading across international markets. Instead, individual exchanges increasingly operate their markets around the clock. Brokers and proprietary traders connect directly to these markets if permitted to do so, or they connect through foreign subsidiaries or through correspondent relationships. By creating a single entity, NYSE Euronext and Deutsche Börse undoubtedly ultimately hope to reduce the costs of creating viable 24 hour markets in which all trading in a given security will be directed to a single exchange trading system.

V. Competition in Derivative Markets

The economics discussed above apply only to security markets for which clearing and settlement procedures allow traders to trade the same security in many different markets. These facilities are the norm in the securities markets, but they generally do not exist in futures markets and in many non-US options markets.

In contrast, almost all futures markets and some options markets are vertically integrated so that a single entity controls the exchange where the contracts trade and the clearinghouse that guarantees the performance of those contracts. Not surprisingly, these companies require that all contracts that they clear trade only on their exchanges.

Since common clearing allows traders to contract with any trader, and to offset their positions with any other trader, traders strongly gravitate to exchanges with the most active trading and the greatest cleared open interests. The order flow externality thus is a particularly strong force in future markets.

Creating contracts that will compete successfully against well-established contract markets is extremely difficult for new exchanges. The only effective competition that well-established futures contract markets have is from OTC derivative contracts. The vertical integration of futures markets explains why the CME and other futures exchanges are such profitable exchanges in comparison to securities exchanges that process far more trades.

The CME mergers with NYMEX and with the Chicago Board of Trade vastly concentrated control of future trading in the United States. However, these mergers had little effect on competition because each of the major futures contract markets—with the possible exception of some of the NYMEX energy contract markets, was already individually essentially an uncontestable monopoly. (The exceptional NYMEX energy contracts experienced substantial competition from ICE because the NYMEX was a very slow and inept adopter of electronic trading technologies in a space where international energy firms had become used to electronic trading through their dealings with other exchanges and with Enron.)

The effect on competition of the combination of the NYSE Euronext's Liffe futures markets with the Deutsche Börse Eurex futures markets will be comparable to that observed for the CME mergers. The resulting company will concentrate control of future trading in the Europe, but the transaction will have little effect on competition because most of the major futures contract markets are already essentially uncontestable monopolies. Placing them under common control will not change the underlying economics.

Exchange-traded options markets in the United States have a more competitive market structure. In these markets, the Options Clearing Corporation (OCC) clears contracts that trade at nine US options exchanges. A buyer who buys an OCC-cleared contract at one exchange can offset her position by selling any exchange where that contract also trades. Unlike the futures exchanges, US options exchanges thus compete with each other to provide execution services. The OCC operates as an industry utility that charges its members for services and rebates excess fees to those members.

If the proposed merger occurs, the combined firm would control three US options markets: NYSE Amex Options, NYSE Arca Options, and the International Securities Exchange (ISE), which Deutsche Börse's Eurex division presently owns. NASDAQ presently owns three other exchanges: NASDAQ Options Market, Boston Stock Exchange, and NASDAQ OMX PHLX (the former Philadelphia Stock Exchange). CBOE Holdings, Inc. owns two US options exchanges, the Chicago Board Options Exchange and C2 Options Exchange. The last options exchange, BATS, presently has a 1.9% (and growing) market share of listed options trading. Following the merger, three major entities will control almost all exchange-listed options trading.

The concentration of option trading in these three entities is troubling, especially if they can exercise substantial control over the OCC. The proposed merger would present fewer concerns about competition if the ISE were spun off so that four (five counting BATS) significant independent competitors would remain. That said, the costs of entering the options exchange space is relatively low. Indeed, three of the current eight OCC participant exchanges started up only in the last few years. Accordingly, the increased concentration in the US exchange-traded options space should not increase pricing power too much unless the remaining exchanges can prevent new exchanges from becoming OCC participants.

VI. Competition in Listing Services

The NYSE Euronext provides listing services to its listed firms. In the United States, NYSE- and Amex-listed issuers pay NYSE Euronext listing fees in exchange for which NYSE Euronext provides various services primarily designed to increase investor confidence in the issuer's securities. These services include the regulation of corporate disclosure, capital structure, and governance standards, and the organization of various media events designed to increase investor awareness. These services are valuable because public investors have come to associate an

NYSE or Amex listing as a standard of quality. NYSE Euronext and its predecessors have actively cultivated their listing brands over more than 100 years.

In the United States, NASDAQ is the only other major exchange providing listing services. NASDAQ has cultivated a high tech image for its listing brand. As the technology industries grew over the last 30 years, the NASDAQ listing came to have substantial value.

NASDAQ's ability to penetrate the listing market and develop its brand was largely due to the early patronage of computer technology companies like Microsoft. These companies remained listed at NASDAQ long after their growth normally would have led them to switch to the NYSE. These information technology companies identified with NASDAQ because NASDAQ's distributed electronic network market structure represented a strong example of the vision that they were promoting to their own customers. Without this unique advantage, NASDAQ's listing business probably would never have developed to its present extent.

NYSE Euronext and NASDAQ now very actively compete with each other to obtain primary listings. Both companies have large marketing departments that cultivate issuer relationships. Both regularly tout their successful attractions of new IPO listings, and they both publicly rejoice when issuers defect to their exchange from the other exchange.

The proposed merger of NYSE Euronext and Deutsche Börse would confer some competitive advantage to the combined entity in its competition with NASDAQ and with competing European exchanges to provide listing services. Subject to meeting diverse regulatory requirements across exchanges, the new entity could offer "one-stop" listing services for issuers interested in accessing capital in multiple markets. As the largest operator of equity exchange markets, the new entity also would provide greater reputational value to its issuers through branding by the world's biggest exchange services company.

Since the announcement of the proposed merger of NYSE Euronext with Deutsche Börse, many stories have appeared in the press about the potential for a NASDAQ-led attempt to acquire break up the proposed merger and acquire the NYSE for itself. Such a combination would raise substantial competitive concerns for listing services.

The resulting combination would control essentially all US primary market listings. Since the value of a listing depends critically on the reputation associated with the listing, and since brand reputations are very difficult and expensive to acquire, the barriers to entry to new competitors in the listing business are very substantial. A combined NYSE — NASDAQ entity could have substantial pricing power in the listing business. Such concentration also could reduce innovation in listing standards, which might not be in the public interest. In addition, the combined firm might use the revenue raised from its listing business to cross-subsidize its exchange services businesses to the detriment of other securities exchanges that compete only in this space.

VII. Alternatives to Merger

Since the announcement of the proposed merger between NYSE Euronext and Deutsche Börse, some commentators have expressed concern about the transfer of a flagship American institution to a foreign entity. This characterization of the transaction may be somewhat misleading because the NYSE Euronext and Deutsche Börse both already are international companies held by investors from throughout the world. In part to address concerns about this issue and to emphasize the international character of the combined entity, the companies propose that NYSE Euronext CEO Duncan Niederauer will become CEO of the merged firm while Deutsche Börse CEO Reto Francioni will become chairman.

Regulators or legislators who oppose the merger for whatever reason should be aware of the potential costs associated with their positions. The most obvious costs would be the lost cost cutting opportunities and the lost order flow consolidation opportunities described above.

Regulators should evaluate these costs relative to the costs of the alternatives that these firms might pursue if they cannot consolidate. For example, smaller exchanges facing substantial technology costs often contract with other exchanges and software development companies to reduce the costs of developing, maintaining, and operating their systems. Although such arrangements seem unlikely for very large exchanges, exchange technologies are highly scalable so that size alone is not a significant barrier to such arrangements.

The two companies also could form a joint venture for the purpose of developing, maintaining, and operating their trading systems while otherwise remaining independent competitors. Joint ventures are common across many industries including finance, but coordination issues and conflict of interest issues among the partners often make them difficult to operate efficiently.

Finally, note that many brokers and various providers of exchange information services already provide order routing facilities to their clients and to correspondent brokers seeking linkages to multiple exchanges. These services are presently readily available to brokers and proprietary traders even if NYSE Euronext and Deutsche Börse were unable to provide common order entry portals through a merger or a joint venture.