CHAPTER 18 APPENDIX A

THE CURRENT NYSE STOCK MARKET

In this appendix, we discuss recent changes in the NYSE. This section focuses on the NYSE because of the significant recent changes in its market structure, advances in technology, ownership, and acquisition of other market venues.

BACKGROUND

For years, even decades, the NYSE gradually increased the use of electronic trading to supplement its specialist-based, human-touch trading. Then, during 2006 and early 2007, this evolution turned into a revolution.

During the previous years, the functionality and capacity of DOT and SuperDOT, discussed earlier in the chapter, continually increased, continually reducing the need for specialist intervention for a larger number of trades. A significant indication of the rapid change in the need for specialist-oriented NYSE floor space was that a new NYSE trading room, which was opened at 30 Broad Street during October 2000, was closed in February 2007.

There were several components of this revolution. The two major components were as follows. First, in December 2005, the NYSE initiated its NYSE Hybrid Market, which gave customers the choice of the traditional auction-based specialists system or the new electronic trading. The basis for the electronic component of the NYSE Hybrid Market was NYSE Direct+, an automatic execution service, the pilot of which was launched in October 2000 and expanded in August 2004.

Second, the crescendo of this revolution occurred in March 2006. On March 7, the NYSE merged with Archipelago Holding Inc. (commonly called “Arca”) and, as a result, became a for-profit, publicly owned company. On the following day, the shares of the newly formed NYSE Group began trading on an exchange, the NYSE of course. As a result, there were no more NYSE memberships or “seats” (which reached a high of $4 million per seat in December 2005). These seats were replaced by NYX shares as a measure of value, and “access” rights for floor trading privileges became available separately.

The period from 2006 through 2007 was exceptionally active for the NYSE. Specifically, the major events during this period were as follows.

1. On March 3, 2006, the NYSE bought Archipelago Holdings, a publicly owned, for-profit exchange (Arca was granted exchange status by the SEC on October 20, 2001). Archipelago bought the Pacific Stock Exchange during January 2005. NYSE Group Inc., a public company, was formed out of the merger of NYSE and Archipelago.
2. On the next day, NYSE Group Inc. conducted its IPO and began trading (ticker symbol: NYX; initial price: $67). Thus, the IPO was arranged in conjunction with the acquisition of Archipelago.
3. Over the period from October 2006 to January 2007, the NYSE introduced the NYSE Hybrid Market, a blend of an auction and an electronic market. Archipelago remained a distinct electronic market.
4. On April 4, 2007, the NYSE Group completed a merger with Euronext NV, a Paris-based European stock exchange, making the NYSE the first trans-Atlantic exchange group. Thus, the NYSE became a global company by buying Euronext. The NYSE went public later than many other exchanges but became an international company before many others.

Thus, during a brief period from 2006 through 2007, the NYSE went public, initiated a hybrid market, and became global.

While the NYSE Hybrid was introduced in the period from October 2006 to January 2007, it was based on systems initiated and developed previously. Some of these are described below:

1. *Designated Order Turnaround Systems (DOT and SuperDOT)*. This system allows brokers to route orders, usually retail orders, directly to the specialist posts or the trading floor for execution. The original DOT system was initiated during 1976 and was continually expanded and improved.

2. *Direct+*. In October 2000, the NYSE introduced this system, which is an automatic execution service on limit orders up to 1,099 shares at the published NYSE quote. The only option for market orders was the standard method. NYSE Direct+ was subsequently expanded and became the foundation on which the electronic component of the NYSE Hybrid Market was built.
3. *OpenBook.* In January 2002, the NYSE introduced this system, which provides limit order book information to traders on the exchange floor. This was the first step in opening the previously closed specialist's order book.

A summary of the key dates and activities follows:

1976	Designated Order Turnaround (DOT) initiated
October 2000	Direct+ initiated
January 2002	OpenBook initiated
March 7, 2006	NYSE buys Archipelago; becomes public company named "NYSE Group Inc."
March 8, 2006	NYSE conducts IPO; listed on the NYSE with ticker symbol NYX
October 2006–January 2007	NYSE Hybrid Market initiated on January 24, 2007, for all NYSE stocks (except for a few high-priced stocks)
April 4, 2007	NYSE completes merger with Euronext; now named "NYSE Euronext"

THE PRELUDE TO THE NYSE HYBRID MARKET

The remainder of this section provides additional information on these elements of the NYSE Hybrid Market and the overall hybrid market.

Designated Order Turnaround Systems (DOT or SuperDOT)

Traditionally, the NYSE has conducted its execution via the specialist system wherein the specialists execute orders presented by floor brokers. However, as explained earlier, the use of electronic trading has continually increased. The key mechanism for electronic trading has been the Designated Order Turnaround (DOT or SuperDOT).

DOT is an electronic system that increases order efficiency by routing orders for listed securities directly to a specialist on the trading floor, instead of through a broker to the specialist. The DOT system is used by the NYSE for small orders, limit orders, basket trades, and program trades.

Electronic trading on the NYSE began in 1976 with the DOT for market orders of 100 shares. DOT's capabilities were expanded over time to accommodate limit orders and larger sizes. DOT was renamed SuperDOT in 1984. The system can be used for orders up to 100,000 shares, and it has the capacity to handle in excess of two billion shares daily. Orders that come in through SuperDOT are referred to as **system orders**. Floor brokers provide the main alternative delivery method.

To some extent, however, separate order handling may be unavoidable. Namely, whereas small retail orders are typically sent electronically by SuperDOT to specialist posts, large orders are commonly worked by floor brokers on a not-held basis or are negotiated in the upstairs institutional market. These procedures, however, are coordinated and the exchange's order flow is reasonably well integrated. This coordination is of critical importance because price discovery should reflect the desires of the broad market to hold shares of stock.

Data on the participation of specialists, floor brokers, and the entire floor (specialists plus floor broker) by Hendershott and Moulton found that since 1999, there has been a continual decline in the floor volume, both floor broker and specialist.[1] The data indicate that floor trading volume began to decline significantly during 2002, the time of the introduction of OpenBook, which provides limit order book data to traders off the exchange floor. By June 2006, floor trading had declined to slightly more than 20% of the total volume from in excess of 50% in January 1999. The specialist share was less than 10% in May 2006. The data by Hendershott and Moulton also show that these shares continued to decline from June 2006 through May 2007, with the total flow volume approximately 10% and the specialists' share approximately 5% during May 2007.

[1] Hendershott, T. and Moulton, P.C. (2007). *The Shrinking New York Stock Exchange Floor and the Hybrid Market.* Working paper, 2007.

During 2007, according to the NYSE, 99% of all orders passed through SuperDOT.

Anonymous SuperDOT (ADOT) enables institutional investors sponsored by a member firm to submit orders directly to the NYSE without the exchange, member firm, specialist, or floor brokers knowing their identity. Institutions that have been sponsored by member firms can use ADOT to send orders directly and anonymously to the point of sale on the NYSE trading floor. With ADOT, the institution will receive transaction reports as they occur, and the member firm will receive a copy only at the end of the day or after an agreed-upon time has elapsed, for clearing purposes.

Direct+

Automatic execution was introduced on the NYSE in October 2000 when Direct+ was launched. Initially, Direct+ provided an automatic execution service only on limit orders of up to 1,099 shares at the published NYSE quote. There was also a 30-second rule for repeat executions belonging to the same beneficial owner. The only option for market orders was the standard auction method.

In 2003, the NYSE began automatically updating the best bid and offer quotes, which reflected changes in the limit order book. Prior to this, the best bid and offer quotes were updated manually by the specialist. Also during 2003, the NYSE launched LiquidityQuote, which disseminated executable, sizable quotes outside the best bid and offer so that users could find greater market size and depth.

After filing during August 2004, the NYSE expanded the NYSE Direct+ automatic trading system by eliminating the limits on the size, trading, and types of orders that could be submitted via Direct+, thus significantly increasing electronic trading at the NYSE.

NYSE Direct+ is the foundation upon which the electronic component of the Hybrid Market is built. NYSE Direct+ enables users to opt for an immediate execution at the best bid or offer, without a fee and with anonymity and speed. The average execution time is 0.36 seconds. This trade volume represents approximately 17% of NYSE's average daily volume. Direct+ has had two main restrictions: (1) a maximum order size of 1,099 shares, and (2) a minimum reload time of 30 seconds. Within the Hybrid Market, these two restrictions have been removed, allowing customers automatic execution up to one million shares, sweep the best bid/offer, and trade without time restrictions.

An important distinction between SuperDOT and Direct+ is that SuperDOT routes the quote or order directly to the specialist and then the specialist actually provides the execution, whereas with Direct+ the system, not the specialist, provides the execution automatically.

OPENBOOK

In January 2002, the NYSE introduced OpenBook, which provides limit order book information to traders off the exchange floor. Immediately after its introduction, OpenBook information was released every ten seconds. As of May 1, 2006, this information was released continuously (as fast as the NYSE system would permit). OpenBook does not include floor trader interest and there are lags in floor executions.

THE NYSE HYBRID MARKET

The changes identified above, and others, led to the launch of the NYSE Hybrid Market during late 2006. Actually, the NYSE Hybrid Market was introduced across the various stocks listed on the NYSE from October 2006 through January 2007. As of January 2007, all NYSE stocks were traded via its electronic Hybrid Market (except for a small group of very high-priced stocks). Customers could send orders for immediate electronic execution, or route orders to the floor for trade in the auction market. In excess of 50% of all order flow is now delivered to the floor electronically. The NYSE Hybrid Market offers customers the choice between the auction system with the opportunity for price improvement provided by the specialist system and very fast automated trade execution provided by the electronic system. Thus, the NYSE Hybrid Market provides investors with a blend of market models, from completely automated to the value-added auction market.

Among the reasons for the NYSE to launch the Hybrid Market were that (1) it wanted to give users the choice of the existing auction mechanism to attain better prices or the new electronic mechanism for faster executions; (2) higher trading volumes could be executed more efficiently; and (3) the SEC Regulation NMS order protection rule afforded protection for better-priced quotes from being traded only in markets that offer automatic protection at the posted quotes, defined as "fast" markets. After the Hybrid Market, the NYSE market qualified as fast a very large fraction of the time.

The Hybrid Market involved several changes in the NYSE's systems and rules, which enhanced the efficiency of the trading process and increased automatic execution and speed. The intent and effect of the Hybrid Market was to expand automatic execution. The specific changes included: (1) orders were no longer limited to 1,099 shares—the new limit is one million shares; (2) the 30-second frequency restriction was eliminated; (3) market orders as well as limit orders are eligible for automatic execution; and (4) market and marketable limit orders are automatically executed by default, rather than requiring a special code.

The Hybrid Market automated much of the specialists' activity, helping them become much more efficient at the point of sale. In order to react to customers, specialists interface with the market through proprietary algorithms that interface with the NYSE Display Book via an NYSE-provided application programming interface (API).

On the trading floor, the NYSE still trades in a continuous auction format. Here, the human interaction and expert judgment with respect to order execution differentiates the NYSE from a fully electronic market. There is still one specific location on the trading floor where each listed stock trades as before. The specialists do on occasion (approximately 10% of the time) facilitate the trades by committing their own capital and as a matter of course disseminate information to the crowd that helps to bring buyers and sellers together.

The NYSE Hybrid Market is an NYSE-developed electronic trading system. Archipelago is an NYSE-acquired electronic trading system. The NYSE could have used Archipelago as its only electronic trading system but did not because it believed that its NYSE Hybrid system was better suited to support the diversity of trade-execution choices and information flows that comprise the NYSE Hybrid Market. The NYSE's platform includes a range of technology tools that help specialists and brokers provide value to customers. The NYSE Group's plan has been to retain the distinct value of both the NYSE and NYSE Arca marketplaces. Eventually the infrastructure supporting the trading platform will be consolidated to provide operating efficiencies while retaining the value-added functionalities of each marketplace.

The NYSE Hybrid Market changes apply only during the continuous trading day not during the opening and closing call auctions, which are handled manually by the specialists.

A new regulatory requirement that is part of SEC Regulation NMS is the order protection rule, which requires market centers to satisfy better-priced quotes in other fast markets before filling orders in their own markets. In order to be a fast market, sub-second automatic execution must be offered as well as the immediate or cancel capability. The Hybrid Market transformed the NYSE from an auction market with an average trade-execution time of 9.0 seconds to a fast market with sub-second turnaround times.

One expectation of electronic trading is that it provides faster executions and higher executions costs than the floor trading. This expectation is supported by Hendershott and Moulton, who state that "the Hybrid experience suggests that while investors who favor faster execution benefit, investors who are more concerned with lower execution costs or low volatility than speed may be worse off in a world without floor trading."[2]

In fact, the NYSE Hybrid Market has considerably increased electronic trading at the expense of floor trading. The Hybrid Market expansion of automatic execution has reduced the potential for specialists and floor brokers to participate manually in executions.

In November 2007, NYSE Euronext announced that it would overhaul its hybrid market system during 2008, possibly permitting market-making firms to act as specialists.

IMPACT OF THE NYSE HYBRID MARKET

As of February 2001, there were 18 specialist firms on the NYSE. Traditionally, NYSE specialist firms were small, private, family-owned businesses. However, recently NYSE specialist firms have consolidated, been acquired by public companies, or have gone public themselves. The increased capital requirements for specialists have

[2] Hendershott, T. and Moulton, P.C. (2007). *The Shrinking New York Stock Exchange Floor and the Hybrid Market.* Working paper, p. 23.

been one factor that has led to a consolidation of the specialist firms. These specialists have continued to face increasing competition from other sources such as ECNs. The increase in electronic trading has reduced the volume of trading through the specialists and, as a result, the number of specialists.

In 2007, the number of specialist firms continued to decline. In November 2007, two specialists firms (Van Der Moolen Specialist USA and Susquehanna International Group LLP) stopped trading on the NYSE floor. These departures left only five specialist firms. These five were units at Bank of America Corp., Goldman Sachs Group Inc., Labranche & Co., Kellog Specialists Group, and Bear Wagner Securities (a unit of Bear Stearns Cos.). Some analysts regarded these departures as a natural move toward more sophisticated electronic trading systems. There had been over forty specialist firms in the early 1990s. In addition, the fraction of shares that required human/specialist intervention decreased as the share executed electronically increased. During 2007, on normal trading days, only 15% of trading required human intervention. On high-volume, volatile days, however, this share increases to 25% because some traders continue to want the service of a specialist on these days.[3]

U.S stock exchanges no longer enjoy a monopoly on trading in their own listed stock. They have lost share to competing exchanges electronic communication networks, and alternative electronic systems. For example, over the period from 2005 to October 2007, the NYSE lost market share, which declined to approximately 40% of the trading on its listed shares versus over 80% in earlier years.[4]

Thus, overall the NYSE has lost market share in its listed stocks to alternative electronic systems such as ECNs, crossing networks, and dark pools. In addition, the market share it has kept has gone primarily electronic via the NYSE Hybrid Market, which has lessened the need for NYSE's traditional specialist franchises. As a result, some question whether a NYSE listing is worth as much if a large share of the listed companies' shares trade away from the NYSE and even the NYSE-traded segment is traded electronically, which is more common across the markets, rather than through a specialist, which is unique to the NYSE.

EURONEXT N.V.

Euronext N.V. was a pan-European stock exchange based in Paris with subsidiaries in Belgium, France, Netherlands, Portugal, and the United Kingdom. In addition to equities and derivatives markets, the Euronext group provided clearing and information services. As of January 31, 2006, markets run by Euronext had a market capitalization of US$2.9 trillion, making it the fifth largest exchange in the world before it merged with the NYSE Group to form NYSE Euronext, the first global stock exchange.

Euronext was formed on September 22, 2000, in a merger of the Amsterdam Stock Exchange, Brussels Stock Exchange, and Paris Bourse, in order to take advantage of the harmonization of the European Union financial markets.

In December 2001, Euronext acquired from the London Stock Exchange the shares of the London International Financial Futures and Options Exchange (LIFFE), and Euronext.liffe was formed in January 2002.

The derivatives activities of the other constituent exchanges of Euronext (Amsterdam, Brussels, Lisbon, and Paris) were merged into Euronext.liffe. Euronext.liffe continues to operate under its own governance. Trading is done electronically through the LIFFE CONNECT platform. Euronext.liffe offers a wide range of futures and option products on short-term interest rates, bonds, swaps, equities, and commodities.

NYSE Group offered ⁚8 billion (roughly $10.2 billion) in cash and shares for Euronext on May 22, 2006. The merger was completed on April 4, 2007, forming the NYSE Euronext. NYSE Euronext then owned the NYSE Group, Euronext, and Archipelago.

AMERICAN STOCK EXCHANGE

During January 2008, the NYSE announced an agreement to buy the American Stock Exchange. The purchase price was expected to be approximately $260 million (plus the proceeds from the sale of Amex's classic lower Manhattan building, expected to be $50 million to $100 million), considerably less than Nasdaq paid for

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[3] Aaron Lucchetti, "Niederauer's First Challenge: NYSE Floor Traders' Future," *Wall Street Journal* (November 21, 2007), p. C 1.
[4] Lucchetti, "Niederauer's First Challenge: NYSE Floor Traders' Future."

the Philadelphia Stock Exchange during November 2007. The Amex is relocating its traders to NYSE's trading floor, which has extra space, as discussed.

The purchase of the Amex will (1) increase the NYSE's relatively new stock options business, (2) increase its Arca Stock exchange listings of emerging company shares by several hundred companies, and (3) strengthen NYSE's already large position in the ETF market.

The Amex had been losing market share in almost everything it traded, including stocks, options, and ETFs, a product it had started in 1993. Its business of listing new companies peaked decades ago. For example, on a trading day in early 2008 when both the NYSE and Nasdaq traded between 40% and 50% of the shares in their own listed stocks, the Amex traded less than 5% of the shares it listed.