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The Consolidation of European Stock Exchanges

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With the growing appeal of cross-border trading in Europe, efforts are under way to establish consolidated exchanges that offer trading in stocks from many European countries. An analysis of these evolving pan-European exchanges suggests that consolidation could reduce the costs and complications of cross-border trading through such enhancements as a standardization of trading platforms. Yet regulatory, legal, and economic barriers to the creation of these exchanges may delay any benefits of consolidation.

With the formation of the European Union, cross-border trading in Europe is growing in popularity. The introduction of the euro and a wider acceptance of equity as a financing tool are encouraging investors in Europe to engage in more cross-border transactions in search of profit-making opportunities. Yet despite the appeal of cross-border trading, most stock exchanges in Europe are national institutions that trade only local, country-specific stocks.

This market structure appears to be changing, however, as an increasing number of stock exchanges are attempting to operate across national borders. Several ambitious initiatives have been undertaken of late to create, through mergers or other consolidations, pan-European exchanges that offer trading in stocks from many European countries. The establishment of these exchanges will likely lead to important benefits for the financial markets. For example, a standardization of trading platforms across exchanges, an increase in market liquidity, and a reduction in market fragmentation—potential by-products of consolidation—could help minimize the costs and problems associated with cross-border trading in Europe.

Nevertheless, consolidation of European stock exchanges on a large scale appears far from becoming a reality. For one thing, a single pan-European exchange is not necessarily the most efficient arrangement; many market participants would instead prefer the product differentiation offered by several smaller venues. The persistence of cross-country regulatory and legal differences also remains a large obstacle to investors engaging in cross-border trading. The relatively high cost of obtaining information on foreign stocks is yet another important consideration. Furthermore, full consolidation of Europe's exchanges may be delayed until the fragmentation of the associated clearing and settlement systems is resolved. These barriers all suggest that investors and companies in Europe will reap the benefits of financial market integration only gradually.

In this edition of *Current Issues*, we take an in-depth look at the evolving pan-European marketplaces. We examine their origins, their strategies, and their potential efficiencies and limitations. In addition, we put the European experience into perspective by comparing the consolidations under way with the twentieth-century mergers of regional exchanges in the United States. Finally, we suggest ways in which European governments could streamline the consolidation efforts.

Stock Exchange Consolidation in Europe

Two recent developments have broadened the appeal of cross-border trading in Europe. The first was the introduction of the euro. As a growing number of countries have adopted the euro, intra-European currency exposure—the risk associated with an unexpected change in exchange rates—has diminished, making cross-border investment more desirable. Significantly, the increased use of the euro has been accompanied by the removal of some regulatory restrictions on intra-European capital flows.

Second, the emergence of an equity culture across Europe has made cross-border investment more common. In the past, most European countries relied on bank-oriented financial systems: investors deposited a large portion of their savings in banks, and the banks played a major role in providing financing to the industry (Allen and Gale 2000). More recently, however, equity has developed into a popular method of financing, as shown by the rise in share ownership in several European countries. In the United Kingdom, for instance, more than one in five households is estimated to have owned shares directly in 1990, compared with less than one in ten in 1980 (Banks and Tanner 1999).

The heightened interest in cross-border trading has given stock exchanges greater incentive to expand across national boundaries.[1] To date, several mergers and strategic alliances have been undertaken to create consolidated, pan-European stock exchanges.[2] In January 1998, Stockholmsbörsen and the Copenhagen Stock Exchange signed a cooperation agreement to form NOREX, a common Nordic equity market. Although the two exchanges remain independent, they allow cross-membership and use a single buy-and-sell order book for each security. NOREX has also adopted common trading rules and a uniform trading platform, SAX-2000—Stockholmsbörsen's trading engine. In 2000, the Iceland Stock Exchange and the Oslo Exchange joined NOREX.

In another consolidation, the Paris Bourse, the Amsterdam Exchange, and the Brussels Exchange in March 2000 formed Euronext, an integrated European stock exchange. Although the different jurisdictions and local licenses of the individual exchanges are maintained, Euronext provides a single operating umbrella for all three exchanges. Trading is centralized, and a uniform trading platform—the Paris Bourse's NSC trading engine—is used, allowing a single trade price to be established. Shares are listed at a national level and companies can select their trading venue from among the three exchanges.

In addition to established market centers, electronic start-ups are attempting to evolve into pan-European exchanges. For example, Virt-X—a joint venture of Tradepoint (a London-based electronic market) and the Swiss Stock Exchange—offers trading in all fully listed U.K. common stocks and in continental European blue-chip stocks.

Advantages of Consolidation

A consolidation of European stock exchanges will likely lead to important benefits for the financial sector. In general, stock exchanges have been shown to display economies of scale both in operations and in trading (Pagano 1989; Steil 2001). With respect to consolidation of exchanges, operational economies of scale can arise from the establishment of compatible or shared trading platforms while trading economies of scale can be realized from the attainment of heightened market liquidity and reduced market fragmentation.

Compatible/Shared Trading Platforms

The consolidation of stock exchanges could give rise to compatible trading platforms, eliminating the need for redundant investment in different trading systems. An exchange incurs substantial fixed costs to develop, upgrade, and operate its trading system. Because such systems often have a similar basic architecture, a merger of exchanges—or the sharing of a common trading platform among several exchanges—would likely be an efficiency-enhancing arrangement.[3]

In addition, common or shared trading platforms could benefit the investment banks and brokers that engage in cross-border transactions. These institutions currently face significant access costs to maintain connections with a variety of trading systems. In this respect, a consolidation of stock exchanges could lead to greater standardization of the trading formats used by the financial industry. It would be more efficient for banks and brokers to connect to a limited number of pan-European exchanges, say, than to a large number of small local stock exchanges with incompatible formats.

Heightened Market Liquidity

The compatibility of trading platforms across Europe could reduce the cost of cross-border transactions, attracting new investors to the equity markets and generating higher trading volumes. High trading volumes are important to an exchange because of the increased liquidity associated with them. Liquidity is the ability to buy or sell an asset quickly and at a price similar to the prices of previous transactions, assuming no new information is available. When buyers and sellers are few in number and arrive sporadically at the market, they may not find each other immediately, and significant price fluctuations can ensue (Pagano 1989). Accordingly, by encouraging new equity investment, the consolidation of exchanges could lead to greater market liquidity in Europe.

Reduced Market Fragmentation
Parallel trading of the same security on different national exchanges contributes to fragmentation of the financial markets. The creation of pan-European exchanges, however, could help to resolve this problem. Under such a system, all buy and sell orders could be funneled through a small number of major exchanges, thereby concentrating, rather than fragmenting, order flows. Greater price stability and more precise price discovery could result from concentrated order flows.

Still, some evidence suggests that a reduction in market fragmentation may be a long-run rather than an immediate benefit of consolidation. Recently, the number of foreign companies listed on Europe's seven largest stock exchanges and the value of foreign equity trading have been relatively modest and have showed no significant growth (see table).[4] Moreover, the five most-traded shares on each of these exchanges did not overlap in December 2001—that is to say, no share was among the five most traded on more than one exchange (Federation of European Securities Exchanges 2002). Because most stocks have not been trading simultaneously on different exchanges, market fragmentation is not a major concern at present. With the increasing integration of the European markets, however, more companies are likely to seek multiple trading venues for their shares, and fragmentation could become a more pressing issue.

Barriers to Consolidation

Despite the potential benefits offered by pan-European exchanges, several forces are working against rapid consolidation. These include the desire for product differentiation, the existence of cross-country legal and regulatory differences, high information costs, home-country bias, and the widespread fragmentation of Europe's clearing and settlement systems.

Product Differentiation
The potential scale economies offered by a single pan-European stock exchange do not necessarily suggest that one such venue represents the most efficient market structure. Investors and companies may prefer to be served by a number of smaller exchanges that offer distinct products and target diverse clienteles. Differentiation of services can allow several European exchanges to operate side by side despite any scale economies brought by a single market center. In the United States, for example, stock trading is conducted by a number of different market centers and electronic communications networks (McAndrews and Stefanadis 2000). Consequently, although an ongoing consolidation may drastically reduce the number of independent exchanges in operation, it is unlikely to produce a single pan-European stock exchange.

Legal and Regulatory Differences
Cross-country legal and regulatory differences may also hinder consolidation. At present, there are several authorities in the European Union countries that regulate securities markets, and each country has its own set of rules. Disparities in national rules discourage cross-border trading because investors and companies must familiarize themselves with the regulatory regimes of various countries. There are, for instance, significant differences in listing requirements as well as in trading practices and antimanipulation laws across Europe.

Accounting diversity poses another obstacle. National accounting and disclosure norms vary widely across Europe: practices in Germany, for example, are

Foreign Trading on Europe's Seven Largest Stock Exchanges

	December 2001			January 2000	
Exchange	Value of Total Equity Trading (Millions of Euros)	Value of Foreign Equity Trading as a Percentage of Total Equity Trading	Number of Foreign Companies Listed as a Percentage of All Listed Companies	Value of Foreign Equity Trading as a Percentage of Total Equity Trading	Number of Foreign Companies Listed as a Percentage of All Listed Companies
London Stock Exchange	311,607.0	57.30	15.67	56.84	17.85
Euronext	145,919.0	0.67	—	—	—
Deutsche Borse	91,423.0	9.65	23.88	17.79	86.67
Bolsa de Madrid	69,527.9	2.84	1.42	0.06	1.24
Virt-X	40,901.0	—	—	—	—
Borsa Italiana	39,125.5	9.19	2.00	1.57	2.23
Stockholmsbörsen	27,193.1	20.82	6.56	20.91	7.36

Source: Federation of European Securities Exchanges (2002).

Note: The value of equity trading is defined as the sum of the value of electronic-book transactions and negotiated deals.

based largely on statutory law, while the United Kingdom has adopted a less rigid approach to accounting (Choi and Levich 1996). Tax treatment is also uneven across Europe: there are different taxes and mechanisms for tax collection as well as different double-taxation treaties (Miskin and Clarke 2001). Furthermore, several European governments have adopted policies that point to a preference for home-country investment. In some countries, pension funds are required to invest largely in domestic government securities; in others, favorable tax treatment is granted to domestic equity investment (*The Economist* 2001).

Information Costs and Home-Country Bias

Consolidation can also be slowed by the information costs associated with international trading. Investors often find that cultural and linguistic differences, along with the geographic distance between home and foreign markets, make access to information on foreign securities more difficult and expensive to obtain. In fact, information costs are a key reason that investors exhibit home-country bias—a distinct preference for holding assets in their country—despite the advantages of international portfolio diversification.[5] In developed countries, for instance, it is estimated that 92 percent of the average equity investment is domestic (Lewis 1999).

Fragmentation of Clearing and Settlement Systems

Europe's fragmented clearing and settlement systems also stand in the way of consolidation.[6] After a trade has been executed, clearing takes place—that is, the buyer and seller confirm the terms of the trade, and the clearing agency calculates the counterparties' obligations. Settlement entails the actual transfer of funds and asset ownership between buyer and seller. Unlike trade execution, which occurs at exchanges, clearing and settlement can be completed at agencies that are either independent or controlled by an exchange.

In Europe, there are numerous clearing and settlement organizations that are sharply divided along national lines. Such fragmentation—which often brings with it redundant clearing and settlement processes—can result in significantly higher transaction costs. According to some estimates, clearing and settlement costs for European transactions are nine times higher than they are for U.S. transactions, and the costs of *cross-border* transactions in Europe can be as much as forty-six times higher than they are in the United States (London Stock Exchange 2001).

Consequently, European stock exchanges may fail to achieve greater integration unless clearing and settlement systems also integrate. For example, for the financial industry to reduce trading costs to American levels, a pan-European central counterparty—similar to the Depository Trust and Clearing Corporation in the United States—may have to be created. A central counterparty takes the other side of every matched deal after trading is completed: buyers purchase securities from and make payments to the central counterparty (rather than their market counterparties), while sellers do the opposite. A similar effort likely to benefit the European financial industry would be the consolidation of settlement operations and of central securities depositories—organizations that record share holdings and provide the mechanisms for their transfer.

A Comparison with U.S. Consolidations

A useful comparison can be drawn between the ongoing consolidation of European stock exchanges and the twentieth-century mergers among regional exchanges in the United States. Similarities between the U.S. and European experiences suggest that marketplace consolidation in Europe may be an extraordinarily lengthy process requiring significant structural changes, yet differences between the two give reason to believe that consolidation could occur somewhat more quickly in Europe.

In the early twentieth century, there were dozens of regional exchanges in the United States—outside the New York Stock Exchange (NYSE), the American Stock Exchange, and the National Association of Securities Dealers—that mainly traded the stock of local companies. However, the industry structure began to change with the introduction of new communications technologies. The emergence of cross-country telephone service after 1915, the coast-to-coast availability of NYSE stock tickers after the mid-1920s, and the development of the open-end teletype after 1935 eliminated geographical barriers, allowing the NYSE to capture a large portion of the regional exchanges' trading volumes (Arnold et al. 1999).

New regulations put forth in the wake of the 1929 stock market crash were another major factor affecting industry structure. In 1936, the U.S. Congress granted exchanges "unlisted trading privileges" permitting an exchange to trade any security that was approved for listing on another exchange (Securities and Exchange Commission 1944). Unlisted trading privileges facilitated the trading of a single stock on multiple exchanges.

Thanks largely to these technological and regulatory changes, the percentage of "regional-only" stocks traded on regional exchanges declined from 63.7 percent in 1929 to 18.3 percent in 1949 (Arnold et al. 1999). Moreover, the dramatic increase in the number of stocks that traded simultaneously on multiple exchanges led to intense competition for order flows: investors could decide where to place buy and sell orders by comparing the cost, speed, and quality of execution in different venues.

This competition sparked several mergers among the regional exchanges, a development that brought additional advantages to the financial sector. For instance, the combined exchanges traded stocks at lower bid-ask spreads, benefiting investors, and the exchanges themselves enjoyed higher values for their membership seats. However, because the technological and regulatory changes did not take place overnight, consolidation still proved to be an extremely gradual process. The more than 100 regional exchanges in operation in the late nineteenth century were reduced to 18 by 1940, 14 by 1950, 11 by 1960, 9 by 1970, and 7 by 1980 (Arnold et al. 1999).

At present, European national exchanges are similar to the U.S. regional exchanges in several ways. For one thing, they mainly trade local, country-specific stocks. Moreover, the removal of certain barriers to cross-country trading and the emergence of an equity culture in Europe are expected to intensify competition for order flows, in much the same way that technological and regulatory changes fueled competition among the U.S. exchanges. These similarities suggest that consolidation in Europe, as in the United States, may advance only gradually, even if the number of stocks that trade simultaneously on multiple exchanges increases appreciably. The ensuing economies of scale in operations and trading may be captured slowly over the years as rationalization progresses.

However, differences between the U.S. and European experiences could suggest a somewhat faster consolidation in Europe. For instance, while the consolidation of the U.S. exchanges had to await the development of new communications technologies, European consolidation does not face similar technological impediments. Indeed, the obstacles to consolidation in Europe are more narrowly regulatory and financial. Since financial and regulatory restructuring can occur faster than technological innovation, one might expect consolidation to proceed a bit more swiftly in Europe than it did in the United States.

Conclusion

The creation of the European Union has reduced many of the barriers to cross-border trading. As Europe's financial markets become more integrated, national stock exchanges will likely derive greater economies-of-scale advantages from consolidation, both in their operations and in their trading of stock. On the operational side, consolidation can lead to reduced trading expenses through such innovations as the adoption of standardized trading platforms. It can also generate trading efficiencies by enhancing market liquidity and minimizing market fragmentation.

Overall, it is too early to predict the exact structure or timing of the new European stock markets. Various impediments to consolidation persist, such as clearing and settlement inefficiencies, regulatory disparities, differences in listing requirements between exchanges, and the existence of exclusive trading rights to particular stocks. Furthermore, although there is some evidence that consolidation could proceed faster in Europe than in the United States, overall the U.S. experience in the twentieth century suggests that the benefits of consolidation may not be gained quickly in Europe.

Going forward, European governments can play an important role in the transformation of the countries' stock exchanges. For example, they could facilitate the consolidation process by fostering competition for order flows among exchanges rather than following protectionist strategies. Competition could be promoted by encouraging regulatory standardization across stock markets and allowing more liberalized trading of stocks on multiple venues. The ensuing benefits would likely be passed on to investors and companies in the form of improved financial services, decreased transaction expenses, and reduced costs of obtaining capital.

Notes

1. The euro and the new European equity culture have led to greater integration of the European financial markets. In recent years, for example, these markets have experienced an increase in their correlation with each other. Furthermore, stock market correlations in Europe are higher than they are in the rest of the world (Frankel 1996; Chelley-Steeley and Steeley 1999).

2. Examples of strategic alliances are the adoption of a common trading system and the implementation of a common system to access multiple trading systems.

3. We illustrate this point by recalling the 1990s, when almost every European exchange built a proprietary trading system—despite the fact that most of the systems had the same basic architecture, the continuous electronic auction. The Deutsche Borse and the London Stock Exchange, for example, each spent more than $100 million to develop separate systems with similar architectures, but with incompatible hardware platforms (Steil 2001). A consolidation of European exchanges would likely reduce duplicate investment.

4. Furthermore, several foreign listings on the exchanges are not European companies.

5. One way investors minimize risk is to diversify among assets with a low correlation of returns. Because correlation among securities in different countries is often low, international diversification may lead to substantial risk reduction. Low cross-border correlations are attributable to such factors as differences in natural resource endowments, government policies, industrial activities,

and business-cycle timing. In general, an internationally diversified portfolio may be subject to significantly less variability than a purely domestic one (Eiteman, Stonehill, and Moffett 1995; Sarkar and Li 2002).

6. This topic is examined in detail by Goldberg et al. (2002).

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