SOME ISSUES ON CROSS-BORDER STOCK EXCHANGE MERGERS

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ABSTRACT

Globalization, internationalization, integration, deregulation, as well as technological advances have provided the impetus for mergers of stock exchanges to facilitate cross-border listings and trading. Cross-border mergers trigger a series of different issues to be analyzed. The focus of our analysis will be on regulatory and competition law issues arising from cross-border stock exchange mergers.

From a competition law standpoint, stock exchange mergers may have a severe impact on the competition among stock exchanges and thus lead to higher fees or lower quality of service. The focus will be on horizontal issues arising from such mergers. Thus, this Article will provide an analysis of the following issues: (1) the provision of primary listing services to domestic companies; (2) the provision of secondary listing services and primary listing services to companies seeking listings outside their domestic market; (3) the provision of on-book equities trading services; (4) markets for bonds and derivatives trading; and (5) markets for information services as well as information technology services.

Some permutations of cross-border stock exchange mergers may induce competitive harm that leads to a post-merger market characterized by a lower degree of competition, and thus a lower degree of innovation and improvement in exchange services. The burden falls on competition authorities to ensure that effective and sufficient competition remains after any consolidation in the stock exchange industry.

It should be emphasized that sound and effective regulation is the key to the development and integration of stock exchanges in the global market. Effective regulation will provide confidence and attract investors,

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allowing stock exchanges to grow and interact. However, there is no single regulation structure that will be suitable to all countries.

1. INTRODUCTION

Globalization, internationalization, integration, deregulation, and technological advances have led to legislative changes such as the Investment Services Directive ("ISD")\(^1\) and its successor, the Markets in Financial Instruments Directive ("MiFID"),\(^2\) which aim at the harmonization of regulation and have led to the creation of a new regulatory environment for capital markets in Europe.

This trend has increased the number of international investors in the European capital markets and has provided impetus to mergers of stock exchanges as a means of facilitating cross-border listings and trading. Stock markets across the globe have been the subject of merger discussions following pressure to cut costs and become more competitive. Besides the New York Stock Exchange's ("NYSE") acquisition of Euronext, which operates exchanges in Paris, Amsterdam, Brussels, and Lisbon, the London Stock Exchange ("LSE") has been the subject of constant speculation since Deutsche Börse AG launched a £1.35 billion takeover bid in December 2004. Further approaches or interest from Euronext NV, the NYSE Group Inc., Australia's Macquarie Bank Ltd., and National Association of Securities Dealers Automated Quotation System ("Nasdaq") have sent the value of the LSE rocketing. LSE's


shares more than tripled from 414 pence even before the Deutsche Börse approach. On June 22, 2007, the LSE agreed in principle to acquire Borsa Italiana in an all-paper transaction valued at about €1.6 billion (£1.1 billion).

More recently, nearly 50 percent of the LSE went to the hands of two rival Gulf states battling to be their region’s leader in the global consolidation of exchanges. Qatar Investment Authority and Borse Dubai now own 48 percent of the LSE following a complex series of deals in which ownership of Europe’s exchanges is being realigned. Börse Dubai secured 28 percent of the LSE as part of a wider deal with the U.S.-based Nasdaq designed to settle their long-running battle for control of the Nordic exchanges and technology operator OMX. The Dubai group bought most of Nasdaq’s 31 percent stake in the LSE for £14.40 per share in cash. In return, it will take a 19.9 percent stake in the combined Nasdaq/OMX group and receive cash. This strategic alliance aims to forge the first global exchange platform, linking the ever elusive “pools of liquidity” in the United States, Europe, and the Middle East.

In addition, within the United States, Nasdaq has agreed to acquire the Boston Stock Exchange (“BSE”), bolstering its clearing capabilities and position in the “dark pools” business as consolidation among exchanges continues. Included in the $61 million deal are the BSE’s holding company, BSE Group, Boston Stock Exchange Clearing Corporation, and BSE’s regulatory authority over the Boston Options Exchange.

The ISD, effective since January 1996, was the legislative centerpiece of the single market program for the securities domain. According to the ISD, each recognized exchange is automatically accepted in other European Union (“EU”) countries and offers remote access to intermediaries in other EU countries without imposing further regulatory burdens. In addition, ISD promoted remote membership and price disclosure.

The EU’s Financial Services Action Plan (“FSAP”)—a

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comprehensive 42-measure\textsuperscript{5} plan to harmonize member states rules with the aim of streamlining the integration of the EU markets—highlighted the need to update the ISD. Moreover, in 2000, the European Council set up the Committee of Wise Men on the Regulation of European Securities Markets to analyze and come up with recommendations on the law-making process concerning securities markets regulation in the EU, aiming both to expedite the process and increase its flexibility in order to incorporate market developments. In 2001, the final report by the Committee of Wise Men on the Regulation of European Securities Markets—commonly known as the Lamfalussy Report—was published,\textsuperscript{6} and some of its recommendations were adopted by the European Council.\textsuperscript{7}

The ISD has been superseded by the MiFID, which will introduce a single market and regulatory regime for investment services in the EU. The objectives of MiFID are to complete the EU single market for investment services and to respond to changes in the securities markets by means of basic high-level provisions governing the organization and conduct of business requirements that should apply to financial services firms.\textsuperscript{8}

\textsuperscript{5} These are mainly EU directives to be adopted prior to 2005. By the end of 2004, almost all of these measures had already been adopted. \textit{See European Commission, Workshop on Methodology for the FSAP Evaluation: FSAP Evolution Chart} (2006), \textit{available at} \url{http://ec.europa.eu/internal_market/finances/docs/actionplan/index/061003_measures_en.pdf} (listing the FSAP measures planned and taken by the European Commission).

\textsuperscript{6} The final report was published on February 15, 2001. For a complete version of the report, see Lamfalussy Report, \url{http://ec.europa.eu/internal_market/securities/lamfalussy/index_en.htm}.


\textsuperscript{8} The key features of MiFID can be summarized as: (1) retaining the "passport" principle contained in the ISD broadening the scope of "core" investment services; (2) introducing the concept of "maximum harmonization," which focuses on "home" state supervision in lieu of "minimum harmonization/mutual recognition," which was the previous applicable criterion; (3) abandoning by certain EU member states of the so-called "concentration rule," which obliges firms to route all client orders through regulated exchanges; (4) including new pre- and post-trade transparency requirements for equity markets; (5) putting in place a more extensive transaction reporting requirement; and (6) most firms falling under the scope of the MiFID will have to comply with the Capital Requirements Directive. \textit{See, e.g.,} Parliament and Council Directive.
European stock exchanges are turning into publicly-listed organizations following demutualization and aim at maximizing profits for their stockholders. Exchanges are moving from an era of monopolies to a new era marked by competition. According to Clayton, Jorgensen, and Kavajecz, sixty new financial exchanges were created between 1990 and 1999. Sofia Ramos identifies the likely contributing factors as “economic freedom in taxes, regulation and banking, and the existence of larger economies. In contrast, technology shocks that increase communication links reduce the likelihood of new exchanges being [physically] established.”

The new wave of economic communications networks (“ECNs”) “in the absence of regulatory barriers [renders] industry entry much easier than ever, since technological advances decrease the costs of setting up [a stock] exchange.”

Several institutional changes were common in stock exchanges in Europe in the last two decades. These changes included: (1) several mergers and acquisitions, and (2) changes in the ownership structures, trading systems, and number of quoted companies, as well as the extension of trading hours. Stock exchanges have merged with derivative exchanges (for example, Euronext and LIFFE) and with settlement operators (for example, Deutsche Börse and Clearstream). Mergers that focus on combining different geographic markets aim at exploiting the economies of scale in trading. Mergers that have combined different activities aim at providing a more complete financial service to customers.

One of the main exchange reforms was the computerization of trading. In 1977, the Toronto Stock Exchange “was the first exchange to computerize its trade.” Most exchanges currently operate electronic trading. The information system, order routing, queuing and execution systems are automated. The greatest advantage of electronic trading is its ability to promote cross-
border trading. The introduction of computerized systems is an important instrument for increasing competition among stock exchanges because it decreases transaction costs and thus increases liquidity. An analysis of international markets suggests that expected savings in total costs from automated execution technology are about 40 basis points.\(^\text{13}\)

In addition, the number of listed companies has increased as an ever-larger number of companies seek access to pools of capital inside and outside their home country. Consequently, stock exchanges have increased trading hours to exploit trading in cross-border listed securities.

Cross-border mergers trigger a series of different issues to be analyzed. From a transactional point of view, some of these aspects include the synergies that a merger creates, the complexities in achieving an optimal financial structure, and protection of minority shareholders. From a regulatory standpoint, there is an array of issues that should also be considered. Regulatory issues can be internal (compliance with rules of the stock exchange) or external (compliance with the regulatory requirements of the competent regulatory body or bodies). Regulatory issues can affect the parties involved in the stock exchange or the stock exchange itself. Moreover, these issues can be exteriorized at a national or international level. For example, the LSE is subject to the UK Financial Services Authority and EU directives, which include the MiFID and other directives such as the Market Abuse Directive,\(^\text{15}\) the Prospectus Directive,\(^\text{16}\) the Transparency Directive,\(^\text{17}\) and the Capital Adequacy Directive.\(^\text{18}\) In

\(^{13}\) One hundred basis points is equivalent to 1 percent.


the same line of thinking, it can be argued that the NYSE abides by its own rules, the regulations imposed by the U.S. Securities and Exchange Commission ("SEC"), and state rules. Moreover, following these examples, it can be stated that both the LSE and the NYSE are subject to international soft law (e.g., International Organisation of Securities Commissions ("IOSCO")\(^1\)) and external treaty obligations (e.g., the General Agreement on Tariffs and Trade ("GATT")\(^2\) and the General Agreement on Trade in Services ("GATS")\(^3\)). In addition, stock exchanges may be faced with the extraterritorial application of laws to their members as result of a dual listings or a private placement sell.

First, we will provide an overview of general regulatory issues affecting financial entities. Consequently, and since one of the first steps to analyze from a regulatory perspective is the competition law\(^4\) implications—since if there is a breach of competition laws the whole merger might not take place—this will be the pillar of our analysis. We understand that observation of competition laws, from a broad perspective, can be understood as a regulatory issue. As far as the competition aspect is concerned, the focus will be on horizontal issues\(^5\) arising from such mergers, rather than any

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\(^2\) GATT was part of the Bretton Wood's enginery with the aim of reducing barriers to international trade and foster—together with the other measures adopted at the time—recovery after World War II. ROSA MARIA LASTRA, LEGAL FOUNDATIONS OF INTERNATIONAL MONETARY STABILITY 346-47 (2006).


\(^4\) The term "competition law" also covers what is known as "antitrust law" in the United States.

\(^5\) From a competition standpoint, stock exchange mergers may have a severe impact on the competition among stock exchanges and thus lead to higher fees and lower quality of service.

\(^6\) Horizontal mergers are mergers between parties that operate in the same relevant market. Such mergers can increase the market power of the merging firms so that they could unilaterally impose a profitable post-merger price increase. Other firms in the market might raise their prices in response, also
vertical issues\textsuperscript{25} arising from cross-border stock exchange mergers.\textsuperscript{26} Within the specific regulatory aspects we will focus on the following competition law issues:

- the provision of primary listing services to domestic companies;
- the provision of secondary listing services and primary listing services to companies seeking listings outside their domestic market;
- the provision of on-book equities trading services;
- markets for bonds and derivatives trading; and
- markets for information services as well as information technology services.

This Article does not purport to substitute the competition/regulation assessment of cross-border stock exchange mergers conducted by any competition/regulatory authority in any jurisdiction. It aims to provide a critical overview of some of the issues that may arise in cross-border stock exchange mergers. It does not attempt to provide a complete competition/regulation assessment of exchange mergers, since competition/regulation authorities can conduct such an assessment in their own capacity.

In addition, this Article does not focus on any particular jurisdiction for assessing the likely anticompetitive impact of exchange mergers. Thus, if this Article alleges a likely adverse impact on competition, it does not refer to the legislation of any particular jurisdiction. This Article adopts a substantive rather than jurisdictional approach, and attempts to address the issues of

unilaterally. Thus, rivalry might weaken. Moreover, a horizontal merger may increase the likelihood of (or stability and sustainability of) collusion, either tacit or explicit, between the remaining firms in the market.

\textsuperscript{25} Vertical mergers are mergers between parties that operate at different levels of an industry. Such mergers, though often pro-competitive, may in some circumstances reduce competitive constraints faced by the merged firm as a result of increased barriers to entry, raising rivals' costs, substantial market foreclosure or increased likelihood of collusion. This risk is, however, unlikely to arise except in the presence of existing market power or in markets where there is already significant vertical integration as well as vertical restraints.

\textsuperscript{26} No vertical issues in any relevant market will be addressed in this paper. For a report that addresses vertical issues to some extent in detail, see \textit{COMPETITION COMM'N, A REPORT ON THE PROPOSED ACQUISITION OF LONDON STOCK EXCHANGE PLC BY DEUTSCHE BÖRSE AG OR EURONEXT NV 6–7, 24–27, 66–74 (2005), available at http://www.competition-commission.org.uk/rep_pub/reports/2005/fulltext/504.pdf [hereinafter COMPETITION COMMISSION REPORT].}
competition that are likely to arise in jurisdictions as a result of cross-border exchange mergers.\textsuperscript{27}

2. SOME NOTES ON STOCK EXCHANGES AND THEIR REGULATION

A capital market is a market within a financial system that provides a range of investment and financing tools. Capital markets can be considered as both primary capital markets (for an initial issuance of securities) and secondary capital markets (for the trading of securities previously issued). Moreover, capital markets operate with either equity securities (i.e., shares of a company, be it by means of an initial issuance or initial public offering ("IPO"), or by subsequent purchases and sales in the secondary market) or debt securities (e.g., bonds or other listed debt instruments). A transaction in a capital market can take place on the market itself (i.e., on a formal stock exchange), or off-the-market (i.e., off the stock exchange). If it occurs off-the-market, it is considered an over-the-counter ("OTC") transaction.

A stock exchange is a formal (regulated) capital market where securities (equity and debt) are issued (primary market) and traded (secondary market). In academic economic literature, there are "at least three views of stock exchanges: the exchange as a market [or trading system], the exchange as a firm, and the exchange as a broker-dealer."\textsuperscript{28}

A stock exchange is a market or trading system that must: (1) provide trade execution facilities; (2) provide price information in the form of buy and sell quotations on a regular or continuous basis; (3) engage in price discovery through its trading procedures, rules, or mechanisms; (4) have either a formal market-maker structure or a consolidated limit order book, or be a single price auction and centralize trading for the purpose of trade execution; and (5) exhibit through system rules or design the likelihood of creating liquidity in the sense that there be entry of buy and sell quotations on a regular basis, such that both buyers and sellers have a reasonable expectation of regularly executing their orders at those quotes.\textsuperscript{29}

In addition, a stock exchange can be seen as a firm that

\textsuperscript{27} In this Article, stock exchange mergers will refer to cross-border stock exchange mergers.


\textsuperscript{29} Id.
produces a composite good—the exchange of securities—which may be formed of different elements, such as price formation, counterpart research, insurance for a good clearing, and the standardization of the good exchanged. According to this view, the owners of the exchange should satisfy all interested entities: intermediaries, issuers, and investors. Due to ownership structures, some of the customers may be the owners of the firms as well. Thus, the exchange’s price for some of its products, e.g., trading fees, can influence the shareholders’ value through the profitability of the exchange itself (and the impact of this profitability on the value of the firm) as well as through the price of the exchange’s composite product that the consumers/shareholders are consuming. Private management and ownership may give greater efficiency to the exchange.

Finally, according to the view of the exchange as a broker-dealer, the exchange is a kind of intermediary among intermediaries. The exchange gathers trading orders and supplies the way of executing them.

An exchange facilitates information production and dissemination, as well as competition among traders. To facilitate this interaction, a stock exchange provides a marketplace where new shares are issued in companies seeking a listing and where those shares can be traded between investors. A stock exchange is responsible for setting criteria that companies must meet and continue to comply with to obtain and retain a listing. An exchange also has to ensure that the marketplace for securities which it operates works efficiently and is as transparent as possible. Finally, a stock exchange regulates direct access to the marketplace through membership admission and subsequent rules.

As seen from previous paragraphs, another important aspect of stock exchanges is regulation. Regulation, as noted by Lastra, “refers to the establishment of rules, to the process of rulemaking, and includes legislative acts and statutory instruments issued by the competent authorities nationally and supranationally, international rules..., and rules issued by self-regulatory organizations and private bodies or ‘clubs.’” Abrams and Taylor

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31 LASTRA, supra note 20, at 84-85.
argue that in order to create an effective regulatory structure, the regulatory agency or agencies that have to perform supervisory functions must: (1) have clear objectives, (2) be independent and accountable, (3) have the necessary resources to perform the tasks commended, (4) have effective enforcement powers, (5) have comprehensive rules covering all aspects, (6) be cost efficient, and (7) have a structure that reflects the structure of the industry that it has to regulate.\footnote{Richard K Abrams & Michael W. Taylor, \textit{Issues in the Unification of Financial Sector Supervision} 5–9 (Int’l Monetary Fund, Working Paper No. WP/00/213, 2000).}

In addition, specific regulation by itself would not be sufficient unless there are: (1) sound corporate governance practices; (2) preventive measures to avoid unfair barriers to entry, anti-competitive practices, and abuse of a market dominant position; (3) tax laws; (4) dispute resolution mechanisms; (5) an insolvency framework; and (6) a respect for the rule of law.\footnote{INT’L ORG. OF SEC. COMM’NS, \textit{Objectives and Principles of Securities Regulation}, Annexure 3 (2002).}

The interaction between regulation and enforcement is carried out by supervision, which in a broad sense includes the following areas:\footnote{LASTRA, \textit{supra} note 20, at 85.} (1) licensing, (2) supervision \textit{stricto sensu}, (3) sanctioning for non-compliance or breaching the applicable set of norms, and (4) crisis management.\footnote{Crisis management in financial institutions can become something of utmost importance due to the special characteristics of certain financial institutions and the risk that they entail (systemic risk) to the financial system. However, according to Allen and Herring, systemic risk refers mostly to that of banks rather than securities markets, since securities firms are less vulnerable to runs and a contagious transmission of shocks, and therefore are less likely to be a source of systemic risk. \textit{See} Franklin Allen & Richard Herring, \textit{Banking Regulation Versus Securities Market Regulation} 26–27 (Wharton Fin. Insts. Ctr, Working Paper No. 01-29, 2001).} Although there is no single correct approach to a regulatory issue, regulation should promote transparency of trading to deter manipulation and ensure the proper management of large exposures, default, and market disruption.\footnote{See INT’L ORG. OF SEC. COMM’NS, \textit{supra} note 33 (proposing 30 principles of securities regulation).}

The aim of stock exchange regulations and enforcement is to provide confidence to investors. If investors are confident with the market, they will be attracted to invest and the capital markets will
Capital markets play an important role in developed and developing countries.

As a result of globalization and deregulation, we have been faced with an increased number of changes in the international financial markets. These changes have been exacerbated by the current business cycle and the need for large amounts of money to finance ongoing transactions. In addition, the technical evolution of communications has provided better and more reliable resources for the financial industry. All of these factors, together with the deregulation and harmonization achieved by means of "soft law," have been determinant factors in the expansion of financial services.

One of the lessons the International Monetary Fund has drawn from the Asian crisis is the need for proper sequencing of capital account liberalization and financial sector development—including supervision and regulation, risk management, and transparency. The Asian financial crisis triggered several proposals to reform the international financial system. These proposals, focusing on the prevention and avoidance of financial crises, have been denominated the new International Finance Architecture. In the wake of the new International Finance Architecture, international organizations such as the IOSCO and the International Accounting Standards Committee ("IASC") are very active in the study, coordination, and promulgation of international standards in the area of financial market regulation and disclosure. Although their promulgations have the characteristic of being "soft law," they are being adopted and transformed in law in developing and

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37 Soft law can be defined as guidelines that become generally accepted although they are neither enforceable nor legally binding.

38 It is worth stressing that most of these changes, starting in the late 1970s and early 1980s, led to a truly international financial market in the early 1990s that has moved extremely quickly as a result of the use of the Internet.


developed countries at both the domestic and regional level. The most relevant documents on stock exchanges in the international arena are IOSCO's 2002 Objectives and Principles of Securities Regulation\textsuperscript{41} and the World Federation of Exchanges' Market Principles 2002.\textsuperscript{42} Also, in the area of payment and settlement, the Committee on Payment and Settlement Systems ("CPSS")—under the auspices of the Bank for International Settlements ("BIS")—has played an important role through the publication of the Core Principles for Systemically Important Payment Systems,\textsuperscript{43} the CPSS/IOSCO Recommendations for Securities Settlement Systems,\textsuperscript{44} and the CPSS/IOSCO Recommendations for Central Counterparties.\textsuperscript{45} In addition to the international standards, specific market associations have played a key role by providing standardized contractual terms, e.g., the "Global Master Repurchase Agreement"\textsuperscript{46} and the "Convertible Asset Swap Transaction"\textsuperscript{47} provided by the International Capital Market Association ("ICMA") and the International Swaps and Derivatives Association ("ISDA"), respectively. The latter has played a very important role in the harmonization of contractual terms that has lead to practice harmonization since the drafters were the participants themselves—which implicitly guarantees their widespread adoption.

\begin{itemize}
  \item \textsuperscript{41} Int'l Org. of Sec. Comm'n's, supra note 33.
  \item \textsuperscript{43} Comm. on Payment & Settlement Sys., Core Principles for Systemically Important Payment Systems (2001), available at http://www.bis.org/publ/cpss43.pdf (providing core principles for payment systems for widespread implementation).
  \item \textsuperscript{44} Comm. on Payment and Settlement Sys. & Technical Comm. of the Int'l Org. of Sec. Comm'n's, Recommendations for Securities Settlement Systems (2001), available at http://www.bis.org/publ/cpss46.pdf (recommending minimum standards intended to cover all types of systems all over the world).
  \item \textsuperscript{45} Comm. on Payment and Settlement Sys. & Technical Comm. of the Int'l Org. of Sec. Comm'n's, Recommendations for Central Counterparties (2004), available at http://www.bis.org/publ/cpss64.pdf (providing recommendations for the major types of relevant risks).
  \item \textsuperscript{46} This is the agreement that governs sale and repurchase transactions. It was developed by ICMA with the Securities Industry and Financial Markets Association and includes legal opinions on its enforceability in different jurisdictions.
  \item \textsuperscript{47} A template designed to use in inter-dealer convertible asset swap transactions.
\end{itemize}
These initiatives and the referred documentation have helped EU regulators because the harmonization of different legal systems was eased by the integration of countries that followed the principles laid down by international organizations and associations. The FSAP and the Lamfalussy report, with its four-level procedure (framework principles, decisionmaking, national implementation and cooperation, and enforcement), also played a key role in the streamlining of financial regulation within the EU. These resulted, as previously mentioned, in the adoption of the ISD, which was superseded by the MiFID. Other directives are also relevant in the area of securities regulation, i.e., the Market Abuse Directive, the Prospectus Directive, the Transparency Directive, and the Capital Adequacy Directive. In addition, a communication on clearing and settlement was issued in April 2004 to improve clearing and settlement allowing market participants to operate effectively in an integrated EU financial market since—as noted by the European Commission—the situation as of today is complex and fragmented, imposing costs, risks and inefficiencies on investors, institutions and issuers. Moreover, a draft proposal for a Directive of the European Parliament and of the Council on payment services in the internal market has been produced, and the final implementation of the Directive is expected for 2008.

While the aims of the EU and NAFTA differ—since the latter only looks to create a free trade association—a positive movement towards the unification of the international financial markets has been accomplished among two of its three members (the United States and Canada). The multi-jurisdictional disclosure system ("MJDS") was "designed to facilitate securities offerings in multiple markets by subjecting the issuer to the regulations of only

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Due to the similarities between U.S. and Canadian securities laws, the SEC authorized Canadian issuers who had complied with their local regulations to issue securities on the NYSE or Nasdaq. Unfortunately, the MJDS has not been extended to other countries since its adoption in 1991. Regrettably, since 1993, it is required to reconcile the financial statements with U.S. generally accepted accounting principles ("GAAP").

On the one hand, with all these changes, financial markets have gained in soundness. "IOSCO recognizes that sound domestic markets are necessary to the strength of a developed domestic economy and that domestic securities markets are increasingly being integrated into a global market." Therefore, a significant amount of credit has shifted from banks to capital markets in the form of securities. In today's current state securities are more liquid, more easily transferable, and have lower transaction costs. On the other hand, since stock exchanges have become publicly listed companies, like any other company, they need to produce dividends, i.e., gains for their shareholders. Moreover, as a result of globalization and in order to be able to compete with digital platforms and continue to generate revenues, they must have an international presence in key financial districts. This trend leads to their need to acquire other players or merge and/or establish links with their competitors or providers of similar services in markets where they are willing to gain access.

However, all these changes and needs of the parties involved should not distract from the three interrelated and sometimes overlapping core objectives of securities regulation laid out by IOSCO: "(1) the protection of investors; (2) ensuring that markets are fair, efficient, and transparent; and (3) the reduction of systemic risk." It should also be borne in mind that stock exchanges, as financial institutions operating in financial markets, are prone to risks and exposure. These risks include: (1) credit risk, (2) market risk, (3) interest rate risk, (4) foreign exchange risk, (5) operational risk (which includes settlement risk), and (6) legal risk.

Modern financial regulation is based on risk management.

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52 Int'l Org. of Sec. Comm'n's, supra note 33, at 1.
53 Id.
54 See, e.g., Avinash Persaud, Liquidity Black Holes and Why Modern Financial Regulation in Developed Countries is Making Short-Term Capital Flows to Developing
posing a challenge to financial firms to develop market-risk management techniques and to investors and regulators to observe and quantify risk. Particularly in the United Kingdom—as noted by Alexander—"the Financial Services and Markets Act 2000 ("FSMA") and its accompanying regulations create a regime founded on a risk-based approach to the regulation of all financial business."55 From the UK perspective, it can be argued that the risk-based approach can be divided into two approaches—a general risk approach and a specific risk-by-risk approach—which are identified under the Financial Services Authority's ("FSA") prudential sourcebook. Although regulation should take into account risks associated with stock exchanges, by no means should regulation deter reasonable risks of the industry. On the contrary, regulators should allow effective management of risks by establishing safety nets to monitor risk-taking and eventually by adopting the necessary measures (e.g., minimum capital requirements) to have a buffer in place that is required as a result of unforeseen circumstances affecting financial markets.

Another issue to consider is how many supervisory bodies should be required for the surveillance of stock exchanges. In this matter, Lastra argues that there is no single answer due to the lack of empirical evidence, and that a state may have a single body, like in the United Kingdom (and Norway and Denmark and more recently in Germany and France), different bodies for different industries (i.e., banking, securities, insurance, etc. as in Italy or Spain) or multiple authorities within the industry, as in the United States.56 The case of the United States is very interesting since there are four sets of norms issued by different regulators: (1) federal laws passed by the U.S. Congress, (2) state laws passed by State legislatures, (3) regulations enacted by agencies (e.g., the U.S.

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56 LASTRA, supra note 20, at 96 (arguing that there is no empirical evidence that any one model of organizing financial supervision is superior to any other). But see Rosa M. Lastra, The Governance Structure for Financial Regulation and Supervision in Europe, 10 Colum. J. Eur. L. 49 (2004) (opposing the idea of a single EU financial regulatory body on the grounds of excessive concentration of power and concerns about accountability and transparency).
In addition, supervision can be performed by public, private, or both types of bodies. However, considering the sensitive nature of the matters involved in the event of a wrongdoing and the potential consequences for the whole economy (e.g., the Asian crisis) or the role to be performed by the government in the event of a crisis (e.g., the Drexel Burnham Lambert Group, Baring Bros., and Long-Term Capital Management Fund cases), a certain degree of public involvement is required. If a failure occurs, regulation should aim at reducing its impact by isolating the distressed entity and avoiding disruptions to the markets.

Supervision requires initial scrutiny to grant a license and ongoing supervision to maintain the permission granted to operate. Ongoing supervision implies compliance with the required filings, meetings with officials from the supervisory body, inspections and additional disclosure that may derive from such inspections, and fulfilment of any resolution or sanction that might be imposed by the regulatory body. In the United Kingdom, sections 19 and 21 of the FSMA impose a general prohibition on, in the course of business, engaging in regulated activities and/or communicating an invitation or inducement to engage in investment activity unless authorized by the FSA. Under section 138 of the FSMA, the FSA has the capacity to enact rules, although specific reference is made to EEA firms and the capacity of the firm’s home state regulator. Those persons that have been authorized by the FSA will have to comply on an ongoing basis with the FSMA and the FSA’s Handbook of Rules and Guidance.

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57 EEA stands for Economic European Area and includes the twenty-seven EU Member States plus Iceland, Lichtenstein, and Norway.

58 The FSA Handbook is a consolidated version of FSA’s rule-making instruments. It is divided into seven “Blocks” and each Block is subdivided into modules.

Block 1 deals with the requirements for all authorized persons and approved persons and contains general interpretative material. One of its modules is “FIT” (the Fit and Proper test for approved persons), which sets out the FSA’s minimum standards for becoming and remaining an approved person.

Block 2 sets out the prudential requirements that will affect firms. The Interim Prudential sourcebook (“IPRU”) has five parts, each dealing with the prudential requirements for different sectors, i.e., (1) IPRU(BANK), the prudential and specific notification requirements for banks; (2) IPRU(BSOC), the prudential
Carmichael and Pomerleano argue that in principle there are two fundamentally different models of regulatory structure (i.e., either based on institutions or on functions). However, lines have blurred and most regulatory structures in the world contain elements of both.

The regulatory structure based on "institutions" fosters the establishment of different separate legal entities to regulate different aspects (e.g., prevention, functioning, crisis management, etc.) of different financial service sectors (i.e., banks, insurance, and securities). In some countries, two of the sectors are regulated together (e.g., securities and insurance, banking and securities, or

and specific notification requirements for building societies and guidance on the exercise of certain of the FSA's functions under the Building Societies Act; (3) IPRU(FSOC), the prudential and specific notification requirements for friendly societies; (4) IPRU(INS), the prudential and specific notification requirements for insurers; and (5) IPRU(INV), the prudential and specific notification requirements for investment firms.

Block 3 sets out most of the requirements that will affect firms day to day. Some of its modules deal with codes of conduct, training and competence, and money laundering.

Block 4 consists of modules describing the operation of the FSA's authorization, supervisory and disciplinary functions. This Block is subdivided into four modules: (1) AUTH (Authorization); (2) SUP (Supervision); (3) ENF (Enforcement); and (4) DEC (Decision Making).

Block 5 contains three modules dealing with the processes for handling complaints and compensation.

Block 6 contains specialist modules, which show how the FSA Handbook of Rules and Guidance applies to certain sectors, such as credit unions. The most relevant of the modules included in this Block from the perspective of this paper is REC (Recognized Investment Exchanges and Recognized Clearing Houses), which provides guidance on how the FSA interprets the recognition requirements and other obligations on recognized bodies, such as Recognized Investment Exchanges and Recognized Clearing Houses, under the FSMA.

Finally, Block 7 contains three modules which set out the requirements for issuers listed on, or seeking admission to, the official list of the UK Listing Authority ("UKLA"), rules that apply to a sponsor and a person applying for approval as a sponsor, along with the prospectus and disclosure document requirements.

In addition, the FSA produces 14 sector-specific tailored handbooks of rules and guidance for small firms (e.g., asset managers, corporate finance advisory firms, general insurance brokers) which are about 90% smaller than the full FSA Handbook of Rules and Guidance and provide the most relevant information for each industry segment. To rely upon a tailored handbook, a firm needs to satisfy itself that it matches the attributes listed for that tailored handbook. Financial Services Authority, FSA Handbook, http://www.fsa.gov.uk/Pages/handbook/ (last visited Dec. 4, 2007).

banking and insurance—but at least there are two different regulatory bodies). The weaknesses of this type of regulatory structure are, inter alia: (1) inefficient use of resources; (2) fragmented supervision; and, most importantly, (3) regulatory arbitrage by large financial conglomerates.

The regulatory structure based on “functions” argues for the establishment of separate agencies to regulate different sources of market failure. Market failure is “a consumer oriented theory of regulation, which is rooted in the idea that market forces are the best means of ensuring that consumers’ needs are met.” The theory is based on the assumption that fierce competition among firms will generate benefits for consumers and that there is a disequilibrium that needs to be restored by means of regulation. The rationale behind this theory is that different “function” regulators will tackle the causes of the disequilibrium. The causes of the disequilibrium are competition, market conduct, asymmetric information, and systemic stability. Obviously, this theory has strengths (e.g., alignment of the regulation with the underlying source of the market problem) and weaknesses (e.g., overlap, conflict of agencies, and the resulting compliance inefficiency).

A third possible alternative in financial regulation supervision is a unified regulatory body, as exists in the United Kingdom, Norway, Denmark, Germany, and France. It is said that a single regulator offers the best solution to efficiency, accountability, conflict problems, and effective regulation of conglomerates (reduction of regulatory arbitrage). However, the Centre for Policy Studies produced a report in 2005 stating that the FSA (the United Kingdom’s single regulatory body) is “one of the most powerful, and one of the least accountable, institutions created in the UK since the war.”

Sound and effective regulation is the key to the development and integration of stock exchanges in the global market. Soundness can be achieved by effective regulation. Effective regulation will provide confidence and attract investors.


Confidence and more investors allow the stock exchanges to grow and interact. The interaction might lead to mergers but at the least will facilitate information-sharing, harmonization, and integration facilitating disclosure (pre-trade and post-trade)—one of the pillars in regulation since it promotes transparency, thus fostering investors' protection.

Regarding the rationale behind a merger between cross-border stock exchanges, a report prepared by LECG argues that the integration of the French, Belgian, Dutch, and Portuguese stock exchanges “allowed Euronext to rationalize its operations and significantly reduce its operating costs.” This report analyzed the effects of the creation of Euronext. The process of integration “expanded the set of securities accessible to a Euronext member” and “increased the liquidity of the merging exchanges.” Therefore, it “reduced the implicit costs of trading.” “This increase in liquidity is reflected in lower bid-ask spreads, greater volume, and lower volatility . . . . [S]avings attained by Euronext through the integration of the trading platforms of its constituent exchanges . . . have been the result, in particular, of the elimination of duplications in IT activities and staff cost savings.”

The cost reductions achieved “were passed on to users via lower trading fees.” The econometric analysis they conducted showed “that the impact of integration on the average trading fee in Paris was a reduction of 15%. The average trading fee in Amsterdam fell by approximately 31% as a result of the creation of Euronext. . . . Integration of the Euronext markets has allowed all


64 Id. at 49, 6.

65 Id. at 49.

“Trading costs can be classified as direct (or explicit) and indirect (or implicit) trading costs. Direct costs include broker commissions and exchange and other fees, while indirect costs relate to effective spreads—i.e., the difference between the price of a trade and the midpoint of the best-quoted bid and ask prices, just prior to the trade. The indirect component includes costs and risks associated with the immediacy or ability to trade without delay.”


66 PAGANO & PADILLA, supra note 63, at 49–50.

67 Id. at 20.
members of the exchange to directly access all of the different markets that Euronext provides.\textsuperscript{68}

The revenues of the exchange are mainly derived from the following sources: (1) trading fees (membership and trading fees), (2) listing fees (initial and yearly listing fees), (3) information and price-dissemination fees, (4) settlement fees, and (5) development and sale of proprietary software.\textsuperscript{69}

"[C]ustomers of exchanges can be divided into direct and indirect customers."\textsuperscript{70} Direct customers are issuers who pay to list on an exchange, intermediaries who are admitted to trading, and information vendors. Indirect customers "send orders to intermediaries to be executed on an exchange: institutional investors and all other financial intermediaries (if not allowed to trade directly) [and] single customers, both physical or juridical persons."\textsuperscript{71}

Having had a brief overview of some issues of stock exchanges regulation and before turning to the particular activities of stock exchanges, this Article will briefly address the concept of network externalities, which is of fundamental value for stock exchange activities.

3. NETWORK EXTERNALITIES

According to the network effect theory, the value of a good or service to a customer depends on the number of customers already owning that good or using that service. Each new user of the product derives private benefits, but also confers external benefits on existing users. This amounts to an externality arising from the operation of networks (network externalities).\textsuperscript{72} Thus, the larger the number of customers using a product, the more valuable the product for the next potential customer. "Networks may not reach optimal size, because purchasers do not take account of [external

\textsuperscript{68} Id. at 49.
\textsuperscript{69} Di Noia, supra note 28, at 20–21.
\textsuperscript{70} Id. at 21.
\textsuperscript{71} Id.
\textsuperscript{72} According to Liebowitz and Margolis, "[n]etwork effects should not properly be called network externalities unless the participants in the market fail to internalize these effects." The difference between a network effect and a network externality lies in whether the impact of an additional user on other users is somehow internalized. S.J. Liebowitz & Stephen E. Margolis, Network Effects and Externalities, in 2 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 671 (Peter Newman ed., 1998).
benefits]." Markets in which incompatible standards compete may 'tip' in the direction of a standard that achieves an early advantage."

Direct network effects have been defined as those generated through a direct physical effect of the number of purchasers on the value of a product (e.g., fax machines). Indirect network effects are 'market mediated effects' such as cases where complementary goods (e.g., toner cartridges) are more readily available or lower in price as the number of users of a good (laser printers) increases.

Examples of markets where network effects are important include, inter alia, stock exchanges, software markets, and car markets. Network externalities are characteristic of the trading industry. Externalities concern both investors and market institutions. In general, networks exhibit positive consumption and production externalities. A positive network externality implies that the value of a unit of the good increases with the number of units sold. There are many products for which users' utility increases with the number other users consuming the good. The essential relationship between the components of a network is complementarily.

Networks exhibit positive size externalities, since a product's value to the user increases as the number of users of the product grows. "As a direct consequence of their self-reinforcing nature, networks frequently exhibit positive critical mass." Network effects become significant after a certain subscription percentage has been achieved, called critical mass. At this subscription percentage, the value obtained from the good or service is greater than or equal to the price paid for the good or service. Thus, "no network of size smaller than this positive size, called critical mass, is ever observed, at any price." However, certain networks

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74 Id. at 952.
75 Liebowitz & Margolis, supra note 72, at 671.
77 Nicholas Economides, Network Economics with Application to Finance, 2 FIN. MKTS. INSTS. & INSTRUMENTS 89, 93 (1993).
78 Id.
become congested beyond critical mass, and thus future customers may seek alternatives.

In particular markets, firms may be very reluctant to change their method of operation, especially if they have to pay the costs of transition. Thus, the self-reinforcing nature of networks creates switching costs for the existing customers. The existence of positive critical mass often means that in the presence of one network, a differently-organized one may not even exist.

"Financial exchange networks . . . exhibit indirect network externalities . . . [E]xternalities arise in the act of exchanging assets or goods. [They may also arise] in the array of vertically related services that compose a financial transaction [including] the services of a broker, of bringing the offer to the floor, matching the offer, etc."\textsuperscript{79}

"The act of exchanging goods or assets brings together a trader who is willing to sell with a trader who is willing to buy."\textsuperscript{80} Therefore, a stock exchange brings together the two complementary types of "willingness." The availability of both types of "willingness" is critical for the exchange to occur.\textsuperscript{81} A positive size externality is that the increasing size of an exchange market increases the expected utility of all participants.

Thus, "the benefit to an individual increases in the number of others on the system. This is sometimes called the 'network externality,' because each new user confers a benefit on all other users. In trading terms, [it is referred as the] liquidity effect."\textsuperscript{82} Thus, higher liquidity increases traders' utility.

Stock exchanges can thus be seen as networks where the more traders enter the market, the more market uncertainty is diminished. The greater the network size, the greater the liquidity of the market is and the more efficient price discovery is. "Liquidity plays a crucial role in financial exchange markets. Without the availability of counter-offers, markets cease to exist, and they are replaced by individualized bilateral contracts. . . .

\textsuperscript{79} Nicholas Economides, The Economics of Networks, 14 INT'L J. INDUS. ORG. 673, 679 (1996).
\textsuperscript{80} Id.
\textsuperscript{81} Id.
[Thus,] high liquidity expands the set of potential counter-offers and enhances the probability of a favorable match.\textsuperscript{83}

Liquidity measures the ability to timely execute a buy or sell order. It is also a measure of price resiliency, i.e., investors’ ability to trade without inducing unfavorable movements in the price of securities. Liquidity allows investors to minimize trading friction and benefits corporate issuers; meanwhile, it enhances stock value and provides a ready market for additional stock.

"Liquidity at a market can only be increased by increasing the number of traders at the market."\textsuperscript{84} Liquidity can be viewed in two dimensions: immediacy, the market’s ability to provide immediate execution for an incoming market order; and market depth, the ability to execute market orders without entailing significant changes to the market price. Traders want to trade in the same markets as other traders and do so where they can find the best terms for their trade. It has been argued that liquidity is inversely related to costs (the total cost of dealing on the exchange) and positively related to accessibility.

A liquid asset can be sold rapidly and at a very low transaction cost. In addition, the transaction involving a liquid asset can take place worldwide. The main measure of liquidity is the bid-offer spread on that share.\textsuperscript{85} On a stock exchange where a share is liquid, the bid offer spread will be narrow; where the same share is quoted on a less liquid stock exchange, the spread will be wide. We have selected AstraZeneca to illustrate the variation on the spread according to the liquidity of the stock exchange. For example, AstraZeneca is quoted on the LSE at 3386.0p (bid) and 3387.0p (offer)—a spread of 1p.\textsuperscript{86} For an AstraZeneca share quoted on virt-x\textsuperscript{87} the spread was 3373.5–3397.5 a spread of 24p.\textsuperscript{88}

The most efficient network may not prevail at the outset or

\textsuperscript{83} Nicholas Economides, \textit{How to Enhance Market Liquidity?}, in \textit{GLOBAL EQUITY MARKETS} 90, 91 (Robert A. Schwartz ed., 1995).

\textsuperscript{84} Nicholas Economides & Aloysius Siow, \textit{The Division of Markets Is Limited by the Extent of Liquidity (Spatial Competition with Externalities)}, 78 AM. ECON. REV. 108, 109 (1988).

\textsuperscript{85} The bid price is the price at which an investor can sell the share to a buyer via the exchange. The offer price is the price at which an investor can buy a share via the exchange.

\textsuperscript{86} Note that “p” stands for pence, 1/100 of GBP.

\textsuperscript{87} Virt-x is an electronic order-driven system for more liquid European securities.

\textsuperscript{88} This was the price as of August 30, 2006.
remain the most efficient. Network size is important to the value of any given trading network. An entrant, by developing its network ahead of its competitors, may acquire size advantages and may exploit tipping effects in order to achieve a significant share of the market.

"A market that settles on a single standard is said to have 'tipped.'"89 Once the market reaches this standard, it may illustrate inertia even in the presence of a better alternative. Network markets tend to tip, which induces intense competition early in the market's existence. Farrell and Shapiro have identified practices that firms may adopt in order to become the standard; such practices include pricing that resembles predatory behavior: deterrence of entry by low pricing in order to become the standard.90

Attempts to coordinate a liquidity switch are likely to be particularly undermined by the heterogeneity of market participants. To take the example of stock exchanges, companies seeking a listing are likely to list on exchanges that are considered to be an established standard, due to the beneficial network effects that such an exchange can offer. These companies do not consider the fact that their listing on a new exchange may benefit the companies that will seek to list on that exchange in the future. Tipping effects can be expected to dissuade market participants from coordinating a switch in liquidity with less than a significant number of other participants.91 Private coordination will produce at least temporary illiquidity. Thus, a significant switch of liquidity would be disruptive, not only to the undertakings involved in the switch, but also to the market as a whole.

The "tipping" theory has received significant criticism. "Liebowitz and Margolis92 argue that the marginal gains of network size are often exhausted at sizes above a critical mass that is small relative to the total market. If the benefits of size are

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89 Page & Lopatka, supra note 73, at 960.
91 See Robert B. Ahdieh, Making Markets: Network Effects and the Role of Law in the Creation of Strong Securities Markets, 76 S. CAL. L. REV. 277, 333 (2003) (noting that these participants may worry that the outcome will "lose any subsequent network competition.").
exhausted, multiple networks can exist." Thus, multiple stock exchanges can exist on which companies will actively seek a listing or where traders will trade.

As the above analysis indicates, the stock exchange industry is characterized by network effects. Firms may derive more utility from being listed on exchanges where there are more analysts and intermediaries, as they give more liquidity to the market. In addition, increasing competition could lower trading fees. Efficiency and quality of the activities are enhanced by the greater number of traders that stock exchanges attract. "The value of being listed for a firm is higher the more listed firms and the more intermediaries trading on the same exchange." 

Other network effects identified in the literature include:

1. There may be indirect effects as a bigger market (more listed firms and intermediaries) may have better side services like clearing and settlement.
2. The bigger the market, the more product-information may be easily available.
3. A bigger the market share, the more this is a sign of market quality.
4. Psychological effects.

Liebowitz and Margolis distinguish between network effects and network externalities. They limit the term network externality to those specific network effects in which "the equilibrium exhibits unexploited gains from trade regarding network participation." Economides and White argue that network externalities embrace network effects.

In markets characterized by network effects, a likely entrant will need to take the risk of developing the new infrastructure but may not induce the necessary demand so as to make the development of a new network profitable. Thus, network effects may pose a significant barrier to entry. In the stock exchange industry, entry costs are substantial, and variable costs are minimal. Unless the likely entrant is able to develop a new

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93 Page & Lopatka, supra note 73, at 962.
94 Di Noia, supra note 28, at 25.
95 Id. at 27.
96 Uncommon Tragedy, supra note 92, at 135.
platform, which can entice adequate liquidity, the platform will not be profitable. As mentioned above, tipping effects in network industries induce lock-in effects. Once a network has achieved a significant market share, it may be difficult for a new entrant to obtain a significant position in the market, since the participants' inertia will render a sufficient movement of liquidity to the new entrant unlikely.

In summary, according to the network effect theory, network effects in the stock exchange industry may induce barriers to entry and lock-in effects, arguably leading to a lack of competitive challenge of the incumbent from potential entrants in the market. In order for new entrants to compete viably with incumbents, a significant move of liquidity to the new entrant is necessary.

Before addressing the implications of a merger between stock exchanges, it would be useful to outline the stages as well as the players involved in completing a particular trade.

4. COMPLETING A TRADE: STAGES AND DIFFERENT PLAYERS

The value chain of trading of stock involves three complementary stages. The stages required to complete a trade are trading itself, clearing, and settlement. In contraposition, it can be said that the value chain for derivatives exchanges is different from that of a stock exchange in several ways. There is no equivalent to the listing service that an equities exchange provides to issuers (derivatives contracts are created by the exchange or by market participants), and contracts are generally settled via a cash payment, reducing the need for settlement services.

In Europe, the three main exchanges at the trading level (in terms of domestic market capitalization) are the LSE, Euronext, and Deutsche Börse. In Germany, all three stages identified above are under common ownership, the so-called "vertical silo." In both the United Kingdom and France, clearing is performed by LCH-Clearnet. In the United States, the main cash equity exchanges are Nasdaq and the NYSE, while there is a monopoly provision of both clearing and settlement by the Depository Trust & Clearing Corporation (DTCC). The relative size of the major stock exchanges of the world is illustrated in Table 1 below.

98 See Depository Trust & Cleaning Corporation, DTCC: Our Structure, http://www.dtcc.com/about/subs/ (last visited Dec. 1, 2007) (graphically detailing the subsidiaries and joint ventures of the DTCC). The Depository Trust & Clearing Corporation ("DTCC"), through its subsidiaries, provides clearance,
TABLE 1: THE TEN BIGGEST STOCK EXCHANGE MARKETS IN THE WORLD BY DOMESTIC MARKET CAPITALIZATION, 2005

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>US$ billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYSE</td>
<td>13,310,592</td>
</tr>
<tr>
<td>Tokyo SE</td>
<td>4,572,901</td>
</tr>
<tr>
<td>Nasdaq</td>
<td>3,603,985</td>
</tr>
<tr>
<td>London SE</td>
<td>3,058,182</td>
</tr>
<tr>
<td>Osaka SE</td>
<td>2,969,815</td>
</tr>
<tr>
<td>Euronext</td>
<td>2,706,804</td>
</tr>
<tr>
<td>TSX Group</td>
<td>1,482,185</td>
</tr>
<tr>
<td>Deutsche Börse</td>
<td>1,221,106</td>
</tr>
<tr>
<td>Hong Kong Exchanges</td>
<td>1,054,999</td>
</tr>
<tr>
<td>BME Spanish Exchanges</td>
<td>959,910</td>
</tr>
</tbody>
</table>

The analysis will follow with a schematic overview of the value chain for equities exchanges (Figure 1 below). The initial offering of securities (bonds and shares) to investors is referred to as the primary market, while subsequent trading of those securities is referred to as the secondary market.

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settlement, and information services for equities, corporate and municipal bonds, government and mortgage-backed securities, and over-the-counter credit derivatives.


100 See COMPETITION COMMISSION REPORT, supra note 26, at 17-18 (noting, as examples of the differences between the value chain for derivative exchanges and equity exchanges, that there is nothing equivalent to a listing service for derivative exchanges and that derivative exchanges experience reduced need for settlement services).
FIGURE 1

Value chain for equities exchanges and related services

Source: CC's analysis.

101 Id. at 18 fig. 1 (reprinted with authorization).
Competition among marketplaces occurs on two levels. Marketplaces compete for listings and for orders (trading services). To elicit more listings, stock exchanges have to attract issuers. To elicit more orders, stock exchanges have to attract traders. Thus, both kinds of competition are related. Marketplaces that have more listings attract more traders, and marketplaces with more traders catch the attention of more issuers. The main services offered by exchanges in the primary market are: (1) admission of equities to trading; and (2) listing services for equities.

Once equity has been admitted to trading, the exchange provides a platform to match the offers and bids of the trading firms, under rules set by the relevant regulator and the exchange. Exchanges also provide a series of ancillary services, including market information services and IT. Revenue is generated by processing market data and related information, and selling this on to customers. Some exchanges also derive revenue from the sale of exchange-related software solutions (e.g., Click XT, Horizon).102

In the analysis of the market structure as a result of a possible merger between LSE, Euronext, and Deutsche Börse, the UK Competition Commission considered the following possible markets:

1. the provision of primary listing services to domestic companies, which for the UK includes only LSE;
2. the provision of secondary listing services and primary listing services to companies seeking listings outside their domestic market constitute separate relevant markets with an international geographic dimension;
3. the provision of on-book equities trading services within the UK and more widely, to include Europe and the United States;
4. markets for bonds and derivatives trading;
5. the provision of clearing services to LSE; and
6. the national provision of settlement services.

These activities, also illustrated in Figure 1, supra, incorporate the main activities of stock exchanges worldwide. The following

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102 See also About OMX, http://www.omxgroup.com/omxcorp/About_OMX/ (last visited Nov. 28, 2007) (providing an overview of OMX Corporate's activities in the securities industry, especially in the Nordic and Baltic region, where it owns exchanges).
sections of this Article will address the activities of stock exchanges and the competition and regulatory implications they may have in the event of a stock exchange merger.

5. LISTING SERVICES

Listing is a service provided by a regulated exchange—on request—to an issuing company with an aim for the admission of its securities to trading. It is a necessary first step undertaken before cash securities may be traded on a regulated financial exchange. By listing the security on an exchange, the issuing company is able to raise capital from investors, both at the time of initial listing and at the time of any additional offering, thereby enabling the issuer to obtain financing for its commercial activities.

The provision of listing services incorporates other services and denotes certain characteristics of the securities: liquidity, the monitoring of exchange trading, while serving as a signal to inform investors that the listed securities have met certain standards.

The following table illustrates the number of listed companies in some of the major stock exchanges around the globe.
### Table 2: Listed Companies in Some of the Major Stock Exchanges

<table>
<thead>
<tr>
<th>Exchange</th>
<th>2005 Total</th>
<th>Domestic Companies</th>
<th>Foreign Companies</th>
<th>2004 Total</th>
<th>Domestic Companies</th>
<th>Foreign Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>American SE</td>
<td>595</td>
<td>495</td>
<td>100</td>
<td>575</td>
<td>502</td>
<td>73</td>
</tr>
<tr>
<td>Nasdaq</td>
<td>3,164</td>
<td>2,832</td>
<td>332</td>
<td>3,229</td>
<td>2,889</td>
<td>340</td>
</tr>
<tr>
<td>NYSE</td>
<td>2,270</td>
<td>1,818</td>
<td>452</td>
<td>2,293</td>
<td>1,834</td>
<td>459</td>
</tr>
<tr>
<td>Hong Kong Exchanges</td>
<td>1,135</td>
<td>1,126</td>
<td>9</td>
<td>1,096</td>
<td>1,086</td>
<td>10</td>
</tr>
<tr>
<td>Shanghai SE</td>
<td>833</td>
<td>833</td>
<td>0</td>
<td>837</td>
<td>837</td>
<td>0</td>
</tr>
<tr>
<td>Tokyo SE</td>
<td>2,351</td>
<td>2,323</td>
<td>28</td>
<td>2,306</td>
<td>2,276</td>
<td>30</td>
</tr>
<tr>
<td>Australian SE</td>
<td>1,714</td>
<td>1,643</td>
<td>71</td>
<td>1,583</td>
<td>1,515</td>
<td>68</td>
</tr>
<tr>
<td>Bombay SE</td>
<td>4,763</td>
<td>4,763</td>
<td>0</td>
<td>4,730</td>
<td>4,730</td>
<td>0</td>
</tr>
<tr>
<td>National Stock Exchange India</td>
<td>1,034</td>
<td>1,034</td>
<td>0</td>
<td>957</td>
<td>957</td>
<td>0</td>
</tr>
<tr>
<td>Singapore Exchange</td>
<td>686</td>
<td>564</td>
<td>122</td>
<td>633</td>
<td>608</td>
<td>25</td>
</tr>
<tr>
<td>Borsa Italiana</td>
<td>282</td>
<td>275</td>
<td>7</td>
<td>278</td>
<td>269</td>
<td>9</td>
</tr>
<tr>
<td>Deutsche Börse</td>
<td>764</td>
<td>648</td>
<td>116</td>
<td>819</td>
<td>660</td>
<td>159</td>
</tr>
<tr>
<td>Euronext</td>
<td>1,259</td>
<td>966</td>
<td>293</td>
<td>1,333</td>
<td>999</td>
<td>334</td>
</tr>
<tr>
<td>London SE</td>
<td>3,091</td>
<td>2,757</td>
<td>334</td>
<td>2,837</td>
<td>2,486</td>
<td>351</td>
</tr>
<tr>
<td>OMX</td>
<td>678</td>
<td>656</td>
<td>22</td>
<td>685</td>
<td>665</td>
<td>20</td>
</tr>
<tr>
<td>Swiss Exchange</td>
<td>400</td>
<td>284</td>
<td>116</td>
<td>409</td>
<td>282</td>
<td>127</td>
</tr>
<tr>
<td>Warsaw SE</td>
<td>241</td>
<td>234</td>
<td>7</td>
<td>230</td>
<td>225</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,260</strong></td>
<td><strong>23,251</strong></td>
<td><strong>2,009</strong></td>
<td><strong>24,830</strong></td>
<td><strong>22,820</strong></td>
<td><strong>2,010</strong></td>
</tr>
</tbody>
</table>

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103 Data exclude investment funds. *ANNUAL REPORT, supra* note 99, at 68.
It is not essential for a company to list on a stock exchange to raise capital. Capital can be raised from a number of other sources, such as:

(1) private investors;
(2) bank finance;
(3) private equity;
(4) issue rights from existing shareholders; and
(5) debt instruments such as bonds or debentures.

However, the choice of financing used has important implications for ownership and control of a company. In reality most companies will have specific financing requirements and will seek an optimal ratio of equity to debt. Therefore, non-equity sources of finance can be viewed as providing a different service than listing on an exchange. In particular, a stock exchange facilitates investment in a company by multiple investors as opposed to a single investor.

In the case of the bids of Deutsche Börse AG and Euronext NV for LSE, the UK Competition Commission also “considered whether, in cases where raising funds was the primary purpose of a listing, alternative sources of finance were equally substitutable.” It concluded, however, “that this is unlikely to be the case: there are limits to the substitutability of debt for equity, and other sources of equity may place constraints on owners, for example, by providing a less liquid form of capital than an equity listing . . . .”

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104 A debt-to-equity ratio measures the leverage of the company along with the potential risks the company faces in terms of its debt load, i.e. to what extent equity can cushion creditors' claims. This ratio provides an idea of the amount of money that can be borrowed in the long term. It is calculated by dividing the total liabilities of the company by its equity. The result of this equation is the percentage of the company that is indebted or leveraged. The normal level of debt-to-equity has changed over time, and depends on both economic factors and society's general feeling towards credit. It also is dependant on the industry and the country. Any company that has a debt to equity ratio of over 4-5 percent should be looked at more carefully to make sure there are no liquidity problems. Subject to their debt-to-equity ratio, corporations have to decide if they are going to finance themselves with debt or equity. However, if a company is too leveraged, the costs of obtaining financing would be too high and from a business point of view it would have no other option than financing itself by means of equity. For further details on the practical side of debt-to-equity ratio, see generally Jack S. Levin, Structuring Venture Capital, Private Equity and Entrepreneurial Transaction (2005).

105 Competition Commission Report, supra note 26, para. 4.7.

106 Id.
In regards to the possibility of new exchanges offering listing services, a rival exchange would first have to obtain significant liquidity to attract issuers to its exchange. Liquidity creates barriers to entry and gives rise to lock-in situations that are difficult to overcome. Because of inertia induced by liquidity, it is almost impossible for users to react to an increase in exchange listing fees by switching to the new entrant.

Companies may have listings on multiple exchanges. A company's main listing is referred to as its primary listing, while subsequent listings on other exchanges are referred to as "secondary listings." The vast majority of companies obtain only a primary listing, almost invariably on their domestic exchange. This "home bias" is a product of a broad range of factors. Of foremost importance, "companies list on the exchange that raises the capital required at the least cost. In general, this will be where the company has a strong market presence and a good reputation . . . generally their domestic market." This tendency towards a home bias means that "demand for listing is inelastic" and "lessens the parties' ability to influence customers' choice of listing venue through listing fees."  

Home bias was initially explained in terms of barriers to international investment, such as government restrictions on foreign and domestic capital flows, taxes, tariffs, and fees. French and Poterba suggest that investors may simply be relatively more optimistic about their domestic markets. Strong and Xu found evidence that fund managers tend to expect higher return from their domestic market. Gehrig argues that home bias in the early 1990s could be explained by informational asymmetries regarding the valuation of foreign securities. Hau states that linguistic and cultural barriers, rather than geographic distance per se, are key to the informational advantage.

Despite factors such as globalization, internationalization,
integration, deregulation, technological advances and legislative changes, empirical evidence reports the existence of home bias in equity portfolios. Local proximity is positively correlated with intra-day profits, indicating local informational advantages. It has been argued that a decrease in home bias is expected because communications will be improved by computerization advances, and information costs of European cross-border investment will be reduced by the economic and monetary union ("EMU"), as well as by technological advances. However, no significant reduction of home bias in the listing of companies is evident in the current state of the stock exchange industry. As the UK Office of Fair Trading ("OFT") stated in the analysis of the possible merger between NYSE and Euronext, there is "a tiny fraction (approximately 0.4%) of listed companies incorporated in the UK that have a primary listing on an exchange other than the LSE for idiosyncratic reasons specific to their business or corporate history.

Due to the intensity of home bias, a cross-border merger between stock exchanges is unlikely to create any competition concerns, as far as the actual competition between these stock exchanges is concerned. Regarding the issue of potential competition between cross-border stock exchanges, the issue of liquidity makes the establishment of a new stock exchange in the home country of another unlikely. Thus, in the absence of any actual or potential competition between cross-border stock exchanges, such mergers are not likely to raise any competition issues, as far as primary listings of companies are concerned.

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115 The OFT is the first phase competition authority for the assessment of mergers. If “the OFT believes that it is or may be the case that...[the merger] has resulted, or may be expected to result, in a substantial lessening of competition,” the OFT refers the merger to the Competition Commission, which will conduct a more thorough investigation of the likely adverse impact of the merger on competition. Enterprise Act of 2002, c. 40, § 22 (Eng.).


117 That may not be true in all cases, but is likely to be true in jurisdictions within the EU, United States, Japan, and Australia.
Apart from primary listings, companies may also have secondary listings. As Table 2 above indicates, the number of foreign companies in each stock exchange is much smaller than the number of domestic companies.

There are, inter alia, two categories of companies that may be interested in secondary listings: companies from countries that lack robust capital markets but that nonetheless maintain their primary listings on their home country exchanges (sometimes for non-economic reasons), and multinationals from countries that enjoy strong capital markets and efficient stock exchanges. In general, reasons for secondary listings might include a complex nationality heritage, a widespread investor base, the existence of a large overseas business division, as well as the regulatory environment of the exchange. In addition, an important set of factors concerns the quality of an exchange. This includes the exchange’s rules and practices, such as those concerning the required levels of disclosure, the transparency of the take-over rules, and other corporate practices.

The Competition Commission Report found that “competition takes place on a global basis for secondary listing services.”\textsuperscript{118} The OFT in the NYSE/Euronext decision argued that “[i]t is conceivable that a UK company seeking greater U.S. exposure may be choosing between these U.S. exchanges, but again, the choice will be within that national capital market, and not between exchanges based in Europe (e.g., Euronext Paris, Amsterdam, Brussels, Lisbon) and these U.S. venues.”\textsuperscript{119} This implies that a company which seeks a secondary listing is likely to identify the capital market that it wishes to access and then consider the relative merits of admitting its shares to secondary listing on the exchanges operating within that region.\textsuperscript{120}

\textsuperscript{118} \textit{COMPETITION COMMISSION REPORT}, supra note 26, para. 5.34. When the EU Prospectus Directive was implemented in July 2005, it introduced a “passport” mechanism that allows companies listed on an EU “regulated market” to make offers across the EEA with a single prospectus approved by the competent authority of the company’s home Member State. Council Directive 2003/71/EC, 2003 O.J. (L 345) 64. This mechanism, in conjunction with improvements in the efficiency of cross-border securities trading, is likely to largely obviate the need for companies incorporated in EU Member States to seek secondary listings on an EU exchange other than their home exchange.

\textsuperscript{119} OFT NYSE/EURONEXT, supra note 116, para. 31.

\textsuperscript{120} Another factor which should be taken into account is that the vast majority of traded shares are at the exchange on which companies are primarily listed.
The Oxera Report\textsuperscript{121} provided the following two tables with admission fees and annual fees for different exchanges on 2005.

**TABLE 3: ADMISSION FEES FOR EXCHANGES, 2005\textsuperscript{122}**

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>Market Capitalisation of £100m</th>
<th>Market Capitalisation of £500m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(£)</td>
<td>(%) of value</td>
</tr>
<tr>
<td>LSE Main Market</td>
<td>45,390</td>
<td>0.05</td>
</tr>
<tr>
<td>LSE AIM</td>
<td>4,180</td>
<td>0.00</td>
</tr>
<tr>
<td>NYSE\textsuperscript{2}</td>
<td>81,900</td>
<td>0.08</td>
</tr>
<tr>
<td>Nasdaq National\textsuperscript{2}</td>
<td>54,600</td>
<td>0.05</td>
</tr>
<tr>
<td>Nasdaq Small Cap\textsuperscript{2}</td>
<td>51,870</td>
<td>0.05</td>
</tr>
<tr>
<td>Euronext</td>
<td>56,512</td>
<td>0.06</td>
</tr>
<tr>
<td>Deutsche Börse</td>
<td>3,440</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Notes:

\textsuperscript{1} The table documents only initial fees that are classified by exchanges as ‘admission fees.’ In some instances, exchanges, or the competent authorities, charge additional fees (e.g., vetting and introduction fees).

\textsuperscript{2} The admission fee on NYSE and Nasdaq is calculated with reference to the number of shares outstanding; for the purpose of this illustration, a median level of share prices observed on the NYSE (c. £14) and Nasdaq (c. £7) is assumed to enable estimation of admission fees.

Source: Oxera calculations based on information available from the exchanges.

\textsuperscript{121} Oxera, supra note 65.

\textsuperscript{122} Id. at 24.


**TABLE 4: ANNUAL FEES FOR DIFFERENT EXCHANGES, 2005**

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>Market Capitalisation of £100m</th>
<th>Market Capitalisation of £500m</th>
<th>Market Capitalisation of £10 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(£)</td>
<td>% of value</td>
<td>(£)</td>
</tr>
<tr>
<td>LSE Main Market</td>
<td>4,029</td>
<td>0.00</td>
<td>8,235</td>
</tr>
<tr>
<td>LSE AIM</td>
<td>4,180</td>
<td>0.00</td>
<td>4,180</td>
</tr>
<tr>
<td>NYSE¹</td>
<td>19,110</td>
<td>0.02</td>
<td>19,110</td>
</tr>
<tr>
<td>Nasdaq National¹</td>
<td>16,653</td>
<td>0.02</td>
<td>24,297</td>
</tr>
<tr>
<td>Nasdaq Small Cap¹</td>
<td>11,466</td>
<td>0.01</td>
<td>11,466</td>
</tr>
<tr>
<td>Euronext¹</td>
<td>2,752</td>
<td>0.00</td>
<td>8,256</td>
</tr>
<tr>
<td>Deutsche Börse</td>
<td>5,160</td>
<td>0.01</td>
<td>5,160</td>
</tr>
</tbody>
</table>

Notes:

1 The annual fee on NYSE, Nasdaq and Euronext is calculated with reference to the number of shares outstanding: for the purpose of this illustration, a median level of share prices observed on the NYSE (c. £14), Nasdaq (c. £7) and Euronext (c. £27) is assumed in order to allow estimation of annual fees.

Source: Oxera calculations based on information available from the exchanges.

As Tables 3 and 4 indicate, the listing and annual fees contribute marginally to the cost of listing of a company. Thus, the major competitive drivers are non-price factors. Non-price factors include, inter alia, the access to capital/pool of equity capital, openness and cultural/economic integration (e.g., willingness of local investors to invest in foreign companies, economic links, financial links, cultural and geographic proximity), liquidity of exchange/sectors, regulatory environment particular to exchange, location of business, listing requirements (e.g., minimum levels of shareholder equity, minimum number of publicly held shares, minimum operating track record), reputation, corporate governance of the exchange, presence of analysts covering that exchange, product innovation (e.g., new products), post trade

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¹²³ *Id.* at 25.
services, process innovation (e.g., trading technology), other direct
IPO costs, surveillance rules, advertising of the exchange's services,
etc. Although changes in the listing and annual fees may not
induce any significant harm to the companies, and thus may not
constitute significant factors affecting the choice of the exchange of
listing, changes in the aforementioned non-price factors may
induce a more significant impact on the choice of the exchange on
which a company will list its securities.

In respect to non-domestic listings, there are a number of
factors that companies consider when deciding whether and where
to take a non-domestic listing. Although companies will also
consider the cost, encompassing not only the admission fee paid to
the relevant exchange, but also the ongoing cost of a listing, having
regard to the regulatory standards with which a listed company
must continue to comply, the most influential factors include the
status and credibility of the market as well as the profile and
prestige of listing on a major international exchange. Additional
considerations include:

the size and depth of the pool of equity capital in a market;
a market's openness to foreign companies and
cultural/economic links between the country of origin of
the issuer and the listing venue; and industry expertise and
a possible desire of companies to list where their peers are
listed (i.e., industry clustering).124

According to the Oxera report, in relation to IPO costs, the
evidence suggests that issuing equity on the London markets is
cheaper than on NYSE or Nasdaq, mainly because of the
systematically higher underwriting fee charged for U.S.
transactions.125 London's position on the cost of IPOs is similar to
that of Euronext and Deutsche Börse.

As mentioned above, a company seeking a secondary listing
aims at benefiting from the size and depth of the pool of equity
capital in a market, the status and credibility of the market as well
as the profile and prestige of listing on a major international
exchange, and the market's openness to foreign companies. Thus,

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124 Id. at 35. Listing in the same exchange as peer companies may be
motivated by a desire to increase their global profile and valuation (e.g.,
technology stocks).

125 Id. at 40 (noting that "the average underwriting fee in the USA is around
6.5-7% of gross IPO receipts, compared with around 3-4% in Europe").
companies of a particular region are more likely to seek a listing in exchanges within that region so as to maximize the benefits they may achieve from their secondary listing.

Since companies make regional choices of stock exchanges, competition is limited to these regions. Thus, Hong Kong and Tokyo are more likely to receive secondary listings of Asian companies. The competition between exchanges does not include LSE, NYSE, Nasdaq, Euronext, Deutsche Börse, Bolsa de Valores de Buenos Aires, or Borsa de Valores de Sao Paulo, but is constrained to exchanges in Asia. Thus, mergers between exchanges that are not on the same continent or in the same region are unlikely to induce any adverse competition concerns as far as the market for secondary listings is concerned.\textsuperscript{126}

Finally, stock exchanges may elicit international listings. The Competition Commission Report identified a separate international market for primary listing services to companies seeking listings outside their domestic market.\textsuperscript{127} These listings are generally sought by companies that do not have a well-developed home exchange, or that require access to international pools of capital (e.g., Russian or Chinese companies). The main exchanges competing for such listings include NYSE, Nasdaq, and LSE.

The United States has traditionally received most of the listings of international companies. Cochrane, Shapiro and Tobin argue that firms are looking for equity as a source of finance, more so now than in the past, and U.S. investors are more receptive to invest in foreign equity.\textsuperscript{128} The U.S. market had benefited from these two trends, acting as an intermediary between the increasing demand and supply. Pagano, Roell, and Zechner studied the geographic pattern of foreign listing from 1986–97 and concluded that while European companies are more outward oriented, European stock exchanges are not.\textsuperscript{129}

\textsuperscript{126} See OFT NYSE/EURONEXT, supra note 116 (identifying a regional geographic frame of reference for secondary listings).
\textsuperscript{127} See COMPETITION COMMISSION REPORT, supra note 26, para. 4.14.
\textsuperscript{128} See generally James L. Cochrane et al., Foreign Equities and U.S. Investors: Breaking Down the Barriers Separating Supply and Demand, 2 STAN. J.L. BUS. & FIN. 241 (1996). The authors point out that in the five years preceding the article, the representation of foreign stocks in U.S. investors' portfolios almost doubled, from 3\% to 5.5\%. \textit{Id.} at 245. The United States' declining share in world equity supply is offered as an explanation for this trend of increased investment in international equity by American investors. \textit{Id.} at 244.
\textsuperscript{129} See Marco Pagano et al., The Geography of Equity Listing: Why Do Companies List Abroad? 24–26 (Ctr. for Stud. in Econ. & Fin., Working Paper No. 28, 2001)
This trend, however, is reversing due to the Sarbanes-Oxley Act of 2002. As regards the impact of this Act, SEC Commissioner Paul Atkins mentioned that the increased costs and risks associated with the implementation of Sarbanes-Oxley had been identified as possible reasons for the substantial shift in new stock listing by foreign companies away from New York.

In a report prepared by Ernst and Young ("Ernst and Young Report"), Goldman Sachs argued that companies performing large capital raises have historically chosen to list in London or New York. This was driven in part by the concern that there was insufficient liquidity in Hong Kong. Increasingly though, Hong Kong has become an alternative for big deals. In addition, since Chinese companies—which are likely to list in Hong Kong—constitute the biggest share of Asia IPO activity and the second highest share of Global IPO activity, Hong Kong remains a significant competitor for these listings. The head of listing of the Hong Kong Stock Exchange stated that as a result of Hong Kong's proximity to China, as well as language and cultural similarities, the Hong Kong Stock Exchange is the natural overseas market for Chinese enterprises.

The Ernst and Young Report indicates that there may be some regional exchanges in competition for some international listings, especially from India and China. Hong Kong Stock Exchange received the biggest Chinese transactions in 2006. It received the three of the five biggest IPOs in 2005, all from Chinese companies. The Ernst and Young Report on the Global IPO (arguing that U.S. exchanges have two comparative advantages over European exchanges: the presence of analysts and investors that specialize in evaluating high-tech companies and greater liquidity).

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131 See Paul S. Atkins, Comm'r, Sec. & Exch. Comm'n, Remarks Before the 4th Annual Financial Services Conference (Jan. 31, 2006) available at http://www.sec.gov/news/speech/spch013106psa.htm ("[T]he reasons why companies may choose not to list in the United States are multifaceted...[I]ncreased costs and risks associated with the implementation of the Sarbanes-Oxley legislation passed in 2002 may be partly responsible.").


133 See id. at 11. These IPOs include: China Construction Bank ("CCB").
Trends states that Hong Kong is expected to complete a steady stream of additional multi-billion dollar deals. Also, the referred report argues that the Chinese government appears to be encouraging companies to list in Hong Kong.\(^\text{134}\)

The Ernst and Young Report includes examples of stock exchanges having representatives in the country in which they seek listings. According to the report, the Hong Kong Stock Exchange has representative offices in Beijing and Shanghai, which enable the exchange to have meetings with companies and their advisors to discuss the benefits of listing in Hong Kong. The same report mentions that Charlotte Crosswell, Head of International Listings for Nasdaq, was recently in Greece in order to elicit listings and that the LSE has dedicated specialist teams in China, Russia and India.\(^\text{135}\)

The two paragraphs above illustrate a degree of regional competition between exchanges eliciting international listings. Although the argument can be made that the market for the international listing of companies is international, the fact that international companies seek exchanges that have similar language and cultural features as well as close proximity constitute evidence of regional competition between exchanges eliciting international listings. The implication of this regional competition is that the major stock exchanges that elicit such listings may not compete for all these listings. For the listing of a Chinese company LSE, NYSE, Nasdaq, as well as the Singapore Stock Exchange and the Hong Kong Stock Exchange may compete. For the listing of a Russian company, LSE, NYSE, and Nasdaq may be more likely competitors. For the listing of an Argentine company, besides NYSE and Nasdaq, Bolsas y Mercados Españoles may also be one of the competing exchanges.

Thus, depending on the country of origin of the international company, not all exchanges may compete for the listing of that company. Taking into account that 25% of the global IPO activity in 2006 is raised by Asian companies, the list of competing exchanges is not limited to NYSE, Nasdaq, and LSE. In addition, the fact that exchanges tend to elicit international listings by representatives in the country of the issuer, indicates that the

\[^{134}\] \textit{Id.} at 12.

\[^{135}\] \textit{See id.} at 24.
competition for these listings takes place in these countries. These two facts indicate that competition between exchanges eliciting international listings may be regional. The regionalism of competition may imply that not all exchanges are competing for all international listings and there may be no overlap in some cross-border exchange mergers. If on the other hand, the competition takes place at an international level, some permutations of exchange mergers may lead to competition concerns.

This outcome is based on an assessment of the publicly known facts. An assessment by competition authorities may determine whether there is an adverse impact on competition in the market for international listings resulting from a merger between cross-border exchanges.

6. **CASH EQUITIES TRADING**

Equities are traded by brokers and dealers for a profit, both on their own account and acting as intermediaries for other investors, principally private individuals ("retail" investors) or institutions lacking direct access to a securities trading system. Equities trading may be conducted either on or off the central order book operated by an exchange. It is estimated that approximately two-thirds of equities trading is conducted off-book.\(^{136}\)

When choosing where to trade, traders can trade "on exchange" or "off exchange". Off-exchange trading involves either:

1. on an alternative trading system ("ATS")—mainly Electronic Trading Networks that facilitate bilateral trading between investors;
2. bilateral trades (often called OTC trading); and
3. internalizing a trade across a bank's own books by matching the buy and sell instructions from their own clients.

The Competition Commission Report identified a relevant market for the provision of on-book equities trading services,\(^{137}\) and concluded that the geographic market should be defined to include Europe and the United States, on the basis that exchanges in these regions place a competitive constraint through the threat of head-to-head competition. Although off-exchange trading poses

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136 *COMPETITION COMMISSION REPORT*, supra note 26, para. 2.4.
137 *Id.* para. 4.55.
significant competitive constraints on on-exchange trading, they do not belong to the same product market. On-exchange trading is suitable for the trading of standardized financial instruments, whereas off-exchange trading is suited for the trading of customized financial instruments.\textsuperscript{138}

An important competition factor is technological advancement. Trading fees do not play an important role in trading. Technological advancements contribute to cross-border trading as well as to more efficient trading by minimizing the delays and thus reducing the associated costs and contributing to beneficial spreads. According to the Financial Times, “Richard Nesbitt, chief executive of the Toronto Stock Exchange (TSX), says consolidation is being driven by technology which—with staff—is one of the two big costs facing any exchange.”\textsuperscript{139} A merger of exchanges can contribute to the reduction of the costs of the technology by sharing platforms. The impact of technology on competition is indicated by the fact that LSE installed a new data transmission system which makes it faster for an order to deal in shares to be reflected on the LSE’s electronic trading platform. According to Furse, the CEO of LSE, behind the resulting significant shift in trading volumes “is the rapid pace of technological innovation which has made high-speed, high-volume trading possible.”\textsuperscript{140}

The intensity of competition in the form of technological advancement is illustrated by the fact that NYSE acquired one of the most successful electronic trading networks, Archipelago. In response, Nasdaq acquired Island, a rival of Archipelago, and Brut, another order routing system. NYSE’s reverse takeover of electronic exchange Archipelago, and Nasdaq’s deal to buy Instinet’s Inet platform have already ensured that both will be well-positioned as speed-of-execution becomes the key to long term prosperity of trading venues.\textsuperscript{141}

A report by the Financial Times ("FT Report") states that, given the rise of algorithmic trading,\textsuperscript{142} which induces increasing volumes of trading, exchanges compete through trading systems

\textsuperscript{138} Id. paras. 4.37–4.39 (providing a detailed analysis of off-exchange trading).
\textsuperscript{139} Christopher Brown-Humes, Consolidation is Fevered but All Bets Are Still On, Fin. Times, Nov. 28, 2006, at 1.
\textsuperscript{140} Norma Cohen, Headlong Scramble for Speed, Fin. Times, Nov. 28, 2006, at 4.
\textsuperscript{141} Id.
\textsuperscript{142} Algorithmic trading refers to trades generated electronically based on very small movements in share prices.
that can withstand very high speed trading. Chris Concannon, a vice-president at Nasdaq, argued that the demand for speed from investors will continue, with even small differences of a few milliseconds in trading time continuing to give an edge in competition.\footnote{143}{Cohen, supra note 140 (quoting Chris Concannon, stating “A few years ago we said when trading times fall below 100 milliseconds, it won’t matter. Now, it is obvious that it does.”).}

As the previous analysis in this work indicates, the intensifying competition in the market is due to commitments by regulators to promote competition (e.g., MiFID)\footnote{144}{According to MiFID there are no requirements in individual member states to trade through a regulated exchange. MiFID may encourage a variety of potential competitors to enter the market. See supra text accompanying note 2.} as well as advancements in technology. New technology allows investors such as hedge funds to execute complex trades in milliseconds. This is likely to build pressure on exchanges to respond with technology capable of equally high speeds.\footnote{145}{See Cohen, supra note 140 (noting how increase speed in completing trades at the LSE will lead to higher demand among investors seeking an edge in competition for greater speed at Nasdaq).}

Finally, pressure from customers has also contributed to intensifying competition. In November 2006, several investment banks announced their plans to set up a European equity trading system (“Project Turquoise”) in direct competition with the LSE, Deutsche Börse and Euronext.\footnote{146}{Project Turquoise Seeks to Create Pan-European Electronic Trading Platform, TRANSACTION NETWORKS & TECHS., Dec. 2006, at 1, available at http://qtt.pelynch.com/news/pdfs/TNT.pdf. The seven banks participating in “Project Turquoise” include Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, Merrill Lynch, Morgan Stanley and UBS. Id.}

These investment banks account for a substantial share (approximately 55%) of LSE’s trading volume.\footnote{147}{James Moore, Search Starts for Chief Executive to Run Rival London Exchange, THE INDEPENDENT, Jan. 13, 2007, at 1, available at http://news.independent.co.uk/business/news/article2149796.ece.} Factors that will determine the success of this project include whether sufficient trading volume will be attracted to the new platform, the availability of alternative clearing and settling mechanisms, and whether stock exchanges will reassess their current fee/innovation structures in response to the new equity trading system. As mentioned above, attempts to coordinate a liquidity switch are likely to be particularly undermined by the heterogeneity of market participants. Such customer-driven initiatives seem to overcome any such coordination difficulties.
The Competition Commission concluded that trading services are in a separate market from listing services for two reasons. First, they "received no evidence to suggest that listing and trading fees are jointly determined . . . . Second, it is not necessary for an exchange to provide both listing and trading services." The Commission offered the example of virt-x in the United Kingdom, which offers a trading service for UK equities, but does not offer a listing service. The Competition Commission also points to LSE's data transmission service, which offers a trading service without a parallel listing service. In addition, of seven "Recognized Investment Exchanges" in the United Kingdom, only LSE accepts listings.

Furthermore, supply-side substitution between post-trade and trading services would not be straightforward. According to the Competition Commission Report, the supply of trading services requires a significantly different infrastructure from the supply of clearing or settlement services. Switching supply from post-trade to trading services would require substantial time and investment.

The primary factor influencing the choice of exchange on which to trade is the existence of liquidity, which is particularly important, as one tends to trade where others are trading. Concentration of liquidity creates barriers to entry and gives rise to lock-in situations that are difficult to reverse. Attempts to coordinate a liquidity switch are likely to be particularly undermined by the heterogeneity of market participants. Tipping effects can be expected to dissuade market participants from coordinating a switch in liquidity with fewer than a significant number of other participants.

148 COMPETITION COMMISSION REPORT, supra note 26, para. 4.17.
149 Id.
151 See Robert B. Ahdieh, Making Markets: Network Effects and the Role of Law in
The following table indicates the trading costs in the secondary market, in the United Kingdom, United States, France, and Germany. According to Oxera,

the direct costs of trading (brokerage commissions and fees) incurred by institutional investors differ significantly across countries. . . . Trading costs can be classified as direct (or explicit) and indirect (or implicit) trading costs. Direct costs include broker commissions and exchange and other fees, while indirect costs relate to effective spreads—i.e., the difference between the price of a trade and the midpoint of the best-quoted bid and ask prices, just prior to the trade. The indirect component includes costs and risks associated with the immediacy or ability to trade without delay. 152

Thus, trading costs represent the fees perceived by exchanges for their intermediation and services.

TABLE 5: TOTAL TRADING COSTS: SAMPLE OF INSTITUTIONAL INVESTORS153

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Direct</th>
<th>Total Indirect</th>
<th>Total Trading Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>40.1</td>
<td>10.1</td>
<td>50.2</td>
</tr>
<tr>
<td>United Kingdom excl. stamp duty</td>
<td>15.4</td>
<td>10.1</td>
<td>25.5</td>
</tr>
<tr>
<td>Germany</td>
<td>18.1</td>
<td>9.0</td>
<td>27.1</td>
</tr>
<tr>
<td>France</td>
<td>18.0</td>
<td>9.1</td>
<td>27.0</td>
</tr>
<tr>
<td>United States—Nasdaq</td>
<td>18.8</td>
<td>11.9</td>
<td>30.8</td>
</tr>
<tr>
<td>United States—NYSE</td>
<td>16.1</td>
<td>7.4</td>
<td>23.5</td>
</tr>
</tbody>
</table>

As the table above indicates, trading fees marginally contribute to the cost of equity trading. Therefore, the major competitive

152 Oxera, supra note 65, at 4, 28.
153 Id. at 29 tbl. 3.8.
drivers behind equities trading are non-price factors. As mentioned above, technology is an essential factor driving competition. Non-price factors include the speed at which the client’s order can be executed, the likelihood of execution of the order, the depth of visible liquidity, and the likelihood of settlement of the client’s order.

The following table presents the value of share trading in some major stock exchanges in the EU and United States.

**Table 6: Total Value of Share Trading in Different Stock Exchanges, 2005**

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>Total Value of Share Trading (US$ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athens Exchange</td>
<td>65,131</td>
</tr>
<tr>
<td>BME Spanish Exchanges</td>
<td>1,566,107</td>
</tr>
<tr>
<td>Borsa Italiana</td>
<td>1,293,682</td>
</tr>
<tr>
<td>Budapest SE</td>
<td>24,151</td>
</tr>
<tr>
<td>Cyprus SE</td>
<td>483</td>
</tr>
<tr>
<td>Deutsche Börse</td>
<td>1,915,305</td>
</tr>
<tr>
<td>Euronext</td>
<td>2,906,208</td>
</tr>
<tr>
<td>Irish SE</td>
<td>67,423</td>
</tr>
<tr>
<td>Ljubljana SE</td>
<td>1,351</td>
</tr>
<tr>
<td>London SE</td>
<td>5,677,721</td>
</tr>
<tr>
<td>Luxembourg SE</td>
<td>330</td>
</tr>
<tr>
<td>Malta SE</td>
<td>150</td>
</tr>
<tr>
<td>OMX</td>
<td>951,421</td>
</tr>
<tr>
<td>Oslo Børs</td>
<td>234,390</td>
</tr>
<tr>
<td>Swiss Exchange</td>
<td>973,509</td>
</tr>
<tr>
<td>Warsaw SE</td>
<td>30,422</td>
</tr>
<tr>
<td>Wiener Börse</td>
<td>46,468</td>
</tr>
<tr>
<td>American SE</td>
<td>608,091</td>
</tr>
<tr>
<td>Nasdaq</td>
<td>10,086,740</td>
</tr>
<tr>
<td>NYSE</td>
<td>14,125,292</td>
</tr>
</tbody>
</table>

As explained in the Competition Commission Report:

Market shares can often give a good indication of the relative market power of different suppliers, and can assist in the assessment of the impact of any proposed merger.

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154 *ANNUAL REPORT, supra* note 99, at 70.
[When comparing exchanges], however, market shares are not a good direct indicator of the market power of exchanges because they will, to a great extent, simply reflect the relative size of the capital markets associated with each exchange.¹⁵⁵

Due to network effects, competition between exchanges manifests itself either through direct head-to-head competition for the trading of equities conducted on the incumbent stock exchange, or the threat of such head-to-head competition. The network effects arise since there are benefits to both the buyer and seller involved in trading where other buyers and sellers exist. The act of exchanging goods or assets brings together a trader who is willing to sell with a trader who is willing to buy.

In order for actual competition to exist in the case of two merging exchanges, the exchanges must trade the same cash equities and be in the same geographic market. However, even if these two factors are satisfied, the actual competition between these exchanges is unlikely to be significant.

In order for the two merging exchanges to trade the same equities, the companies that have issued these equities must have more than one listing. In that case, the primary listing is likely to contain the vast majority of the listed shares. The exchange where the secondary listing will have occurred is likely to have only a small amount of the issued stock.¹⁵⁶ The amount of trade that originates in the “primary” exchange is likely to be significantly bigger than the volume of trade originated in the “secondary” exchange.¹⁵⁷ Thus, the competition between these two exchanges is not likely to be significant.

An additional argument that can be made regarding actual competition is that when choosing the equity in which they want to invest, investors make their decision based upon the cash-flow they want to earn, irrespective of the actual equity they choose. This implies that a different form of actual competition can be identified, since exchanges compete in the bundles of shares that

¹⁵⁵ COMPETITION COMMISSION REPORT, supra note 26, para. 5.18.

¹⁵⁶ Since the “secondary” exchange is likely to have a small proportion of the listed shares of the company, the competitive constraint between the “primary” and “secondary” exchange is likely to be insignificant.

¹⁵⁷ The “primary exchange” is the exchange where the primary listing is located, and the “secondary exchange” is the exchange where the secondary listing is located.
are likely to achieve the same cash-flow to investors. Thus, a
different bundle of shares in two different stock exchanges can
induce the same cash-flow, and thus can be substitutable.
According to this aspect of actual competition, stock exchanges
compete with each other since, in most stock exchanges,
combinations of equities can be found that are likely to satisfy the
investment needs of investors.

Although such a practice may be followed by investors and, in
general, institutional investors, individual investors are likely to
trade on the exchange where their chosen equities are listed. In
addition, an investor trades a particular equity depending on its
characteristics. The trading of these instruments is driven by his
desired return on his investment and satisfies certain criteria that
the investor wishes to meet including, inter alia, liquidity, price,
risk allocation, return on the investment, reputation of the
company whose equity the investor trades, efficiency and
transparency of the trading systems, as well as the efficiency of
clearing and settlement systems.

As mentioned above, exchanges where these equities are
primarily listed will receive a higher number of trades compared to
the secondary exchanges, due to the fact that the majority of the
issued shares are on the primary exchange. When both primary
and secondary exchanges have the same number of shares of a
company, if a single trader switched from one exchange to the
other, the liquidity would shift to that exchange. Hence, due to the
impact of liquidity and network effects, companies have the
tendency to concentrate the trading in one exchange.

An additional aspect of competition for equities trading is
potential competition between stock exchanges. The threat of
head-to-head competition for the trading of equities conducted on
the incumbent stock exchange places competitive constraints on
the incumbent, and any merger between a potential entrant and
the incumbent will remove these competitive constraints, possibly
allowing the merged entity to behave anti-competitively.

As the above analysis indicates, the actual competition between
cross-border stock exchanges is not likely to be strong, if it exists at
all. Thus, the effects of a cross-border stock exchange merger on
competition are not likely to be significantly adverse.

In order for potential competition to exist, a transfer of liquidity

158 See, e.g., Ramos, supra note 10, at 19 (explaining that institutional investors
represent between 70% and 80% of the NYSE's average volume traded).
from the incumbent exchange to the new entrant in the market must be likely. The Competition Commission Report noted that “network effects make a liquidity shift hard to achieve” and that “in order for liquidity to shift, the incentives for trading firms have to be substantial.”\(^{159}\) The Competition Commission went on to identify seven necessary conditions for switching to take place:

(a) the new entrant must provide lower pricing and better quality of services;\(^{160}\)

(b) the new services must be able to be delivered by the entrant at a low cost;

(c) the customers must be dissatisfied with the incumbent provider;

(d) there must be a powerful, concentrated customer group, which has the ability to switch its trading business from the existing venue to the new provider;

(e) this customer group must move in a coordinated fashion;

(f) there must be no regulatory or political barriers in place fettering the entrant; and

(g) there must be full access to existing clearing and settlement infrastructure.\(^{161}\)

The exchange brings together the two complementary types of “willingness”—the willingness of two parties to sell and buy at Price “\(p\)” The availability of both types of “willingness” is critical for the exchange to occur.\(^{162}\) A positive size externality is that the increasing size of an exchange market increases the expected utility of all participants. Each investor benefits from the presence of other investors trading on the same platform. This is because the presence of larger numbers of traders tends to bring liquidity to the market. Thus, volume tends to concentrate on one trading platform. Traders are likely to send their orders simultaneously

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\(^{159}\) COMPETITION COMMISSION REPORT, supra note 26, para. 5.59.

\(^{160}\) The Competition Commission was referring to pricing towards the exchange’s customers (e.g., banks, etc.).

\(^{161}\) COMPETITION COMMISSION REPORT, supra note 26, para. 5.60.

\(^{162}\) See Nicholas Economides, The Economics of Networks, 14 INT’L J. INDUS. ORG. 673, 679 (1996) (explaining that an exchange of assets “brings together the ‘willingness to sell at price \(p\)’ (the ‘offer’) and ‘willingness to buy at price \(p\)’ (the ‘counteroffer’) and creates a composite good, the ‘exchange transaction’”).
since the likelihood of these orders being executed increases. For a credible threat of head-to-head competition, a competitor must offer a service with sufficient incentives to induce trading firms to overcome the disadvantages associated with switching costs.

Clearing and settlement arrangements are also obstacles to competition for trading. Any entrant arguably requires access to the same or equivalent back office infrastructure as the incumbent. Other key issues include the quality of regulation and stock exchange rules, costs of trading and post-trading, technology improvements that benefit users, the costs of investment in IT systems, and technology and the extent to which markets offer access to a rich variety of fund managers and investors.

The UK Competition Commission identified “two broad strategies that can be adopted to engage in head-to-head competition with an incumbent exchange, which could lead both [exchanges] to a shift in liquidity and/or induce the incumbent exchange to react by improving its offer.”163 A potential entrant may offer the same type of service as the incumbent, at a lower price. The Commission further stated that “in order for this strategy to succeed, the competitor needs to be able to afford to offer a sustainable incentive to switch liquidity in the form of a lower price.”164 In addition, the competitor exchange

may focus[] on product differentiation and [aim] to capture market share from the incumbent by introducing an offer which is seen as superior to the incumbent by a significant number of its users. In any attempt to shift liquidity there may be elements of both strategies as firms attempt to offer both a better and cheaper service.165

The Competition Commission identified a number of exchanges that exercise a competitive constraint on the LSE, including Euronext, Deutsche Börse, Nasdaq, NYSE Group, and OMX.166 The Competition Commission argued that “the threat that [these exchanges] will expand their services and compete directly with LSE which disciplines LSE, forcing it to maintain higher service levels and lower fees than would otherwise be the case.”167

163 COMPETITION COMMISSION REPORT, supra note 26, para. 5.38.
164 Id.
165 Id.
166 Id. paras. 5.64–71.
167 Id. para. 5.80.
Given the number of credible potential competitors to the LSE, the Competition Commission concluded that the elimination of the horizontal constraint exercised by any one potential competitor is insufficient to give rise to a substantial lessening of competition within the market for on-book equities trading services in the United Kingdom.\textsuperscript{168}

In Europe, the examples of competition for trading in listed securities (such as, in 2004, the Dutch Trading Service) should be seen as credible threats—effective in gathering support among users and forcing incumbent exchanges to react—rather than as shifts in market shares. The degree of competition for trading is consequently low, and the threat of competitive entry (including from a non-European/U.S. exchange) is not likely to place a strong constraint on the major European exchanges.

As mentioned above, it is unlikely that there is any significant actual competition in the market for the trading of cash equities between stock exchanges. As far as potential competition is concerned, network effects make a liquidity shift hard to achieve and, in this sense, represent a switching cost for customers. These costs imply that in order for liquidity to shift, the incentives for trading firms have to be substantial. Incentives may take the form of lower trading costs or incentive payments by the entrant exchange. However, for exactly the same reasons, the potential benefits for a competitor to induce such a shift are proportionately higher. Once gained, it will be hard for the incumbent exchange to win these customers back. Thus, the liquidity for a particular equity or group of equities will typically rest in one exchange. The shifting of that liquidity is crucially dependent on network effects. The stickiness of liquidity therefore represents the greatest barrier to entry in trading.

Even if the argument of strong potential competition is valid, the potential entrants in the EU include, inter alia, LSE, Euronext, Deutsche Börse, Nasdaq, the NYSE Group, and OMX. Thus, any merger between two of these stock exchanges is unlikely to induce significant anticompetitive concerns in the EU, since there are adequate stock exchanges in the post-merger market to impose a credible threat of head-to-head competition on an incumbent.
7. TRADING OF DERIVATIVES

Derivatives are securities whose value is derived from some other time-varying, underlying instrument, usually the price of bonds, stocks, currencies, or commodities, as well as the movement of an index. Derivatives aim at providing insurance against market fluctuations. Trading in derivatives does not involve actual issuance of physical securities.

Examples of derivatives are futures and options. A futures contract is a standardized, transferable, exchange-traded contract that requires delivery of a commodity, bond, currency, or stock index, at a specified price, on a specified future date. While options entail a right, futures convey an obligation to buy. An option is a right to buy (call option) or sell (put option) an asset by a set date for a set price.

Exchanges may trade in equity derivatives, equity index derivatives, capital market or long-term interest rate derivatives, money market or short interest rate derivatives, commodity derivatives, and currency derivatives. An argument can be made that the above-mentioned types of derivatives constitute separate product markets. Each type of derivative has different characteristics and is used to achieve a different investment outcome. Derivatives exchanges may trade products in these areas.

Liquidity for each product tends to be concentrated on one exchange. Exchanges tend not to compete directly with each other but may impose a competitive constraint through the threat of launching a trading service for a specific derivative contract in direct competition with an existing exchange.

A significant number of derivatives trades are completed off-exchange. OTC trading of derivatives is more intense than OTC trading of equity. OTC provides a customized service, including less regulation than applicable to on-exchange trading, private

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170 With regards to bonds, this Article will focus on the listing and trading of bonds rather than on post-trade services related to bonds.

171 SCOTT & WELLONS, supra note 51, at 939.

172 See COMPETITION COMMISSION REPORT, supra note 26, para. 2.4 (discussing equity trades that can occur off-book).
negotiations, as well as discretion in the price. In particular, negotiations for on-exchange trading are transparent; whereas they are private in OTC trading, trading on-exchange is a regulated market where trades are standardized and are cleared and netted. OTC trading involves unregulated markets, where standardization as well as clearing and netting is limited. In addition, traders may have access to a wider pool of liquidity on exchange, including customers whose credit standing precludes them from using OTC trading.

OTC and certain types of on-exchange derivatives tend to be complementary, since OTC occurs in complex transactions that cannot be completed on-exchange. For certain types of derivatives (e.g., when the underlying asset is equity), OTC plays a less significant role, compared to derivatives having other underlying assets.

Criteria that investors take into account in choosing between on-exchange and OTC trading, include inter alia, the risk against which investors want to hedge, the availability of a suitable on-exchange traded product, the size of the trade, the customization of the trade needed, the anonymity as well the desired impact on the price of the instrument, and the costs involved in the trade.

Not all exchanges offer trading in all types of derivatives. If derivatives using different underlying assets are not substitutable from the customers' perspective due to the fact that they satisfy different customer needs, then each type of derivative may constitute a separate product market. In order for investors to substitute between two derivatives contracts having different underlying assets, these contracts must provide the same investment outcome that the investors want to achieve. For example, the financial market risk against which the investor aims at insuring, will determine the type of derivative he will use. Factors such as the duration of the derivative contracts, as well as the legal aspects also contribute to the substitutability of different types of derivatives contracts.

However, if investors can achieve the same investment outcome by trading two different types of derivatives, or a bundle of different types of derivatives, then there is some substitutability between these types, and the product market may include more than one type of derivative. For example, customers may trade on derivatives that have equity of multinational companies as their underlying asset. This type of investment incorporates derivatives traded on more than one exchange as a means to hedge the market
risks they face. Thus, these derivatives may be considered substitutes for one another.

In order for all the types of derivatives, irrespective of the underlying asset, to constitute one market, exchanges must be able to easily switch between the provisions of trading of these types of derivatives. However, as is the case with equity trading, liquidity plays an important role on the exchange that will have the majority of trading of a particular type of derivative. As the Competition Commission Report stated, derivatives exchanges may trade products in “equity derivatives, equity index derivatives, capital market or long-term interest rate derivatives, money market or short interest rate derivatives, commodity derivatives, and currency derivatives.” In addition, “liquidity for each product tends to be concentrated on one exchange.”

Another possible angle of the product frame of reference for derivatives is whether derivatives are substitutable according to the type of derivative (e.g., future vs. option) rather than according to the underlying asset. Investors are driven by the return on their investment. Thus, it seems likely that investors will use the underlying asset as the major choice factor. They are more likely to invest based on underlying assets familiar to them (e.g., stock index, interest rate) rather than on the type of contract. The choice of the type of contract (e.g., option, future) is likely to be made after the underlying asset has been chosen. Thus, it seems unlikely that the market will be defined according to the type of contract.

The OFT in the analysis of the Euronext NV/Liffe Holdings plc merger argued that, in the short term, exchanges tend to specialize in certain product areas. Liquidity for each product tends to be concentrated on one exchange, and, therefore, exchanges do not always compete directly with each other. Although some customers substitute between products, each product has different characteristics and is traded in different situations for different investment aims.

The OFT defined five separate derivative products: (1) single
stock, (2) equity indices, (3) capital (medium- to long-term interest rates), (4) money (short-term interest rates), and (5) commodities. In addition, the OFT argued that OTC trading provides some degree of competitive constraint on exchanges, in terms of both prices and services. In the long term, the OFT argued that exchanges compete with each other in terms of innovation, rules, cost reductions, and other services. The relevant product market in the longer term was defined as the supply of derivative exchange services. However, in contrast to the OFT's position, the Competition Commission Report argued that derivatives exchanges "may trade products . . . in a selection of . . . areas." 177

Although no concrete conclusions can be made regarding the product and geographic market of derivatives trading, it seems likely that each type of derivative constitutes a separate product market with an international dimension. Thus, separate product markets may be identified for equity derivatives, equity index derivatives, long-term interest rate derivatives, short-term interest rate derivatives, commodity derivatives, and currency derivatives. There may be some scope for derivatives having similar underlying assets (e.g., long-term interest rate and short-term interest rate derivatives) to constitute one single market. However, this will depend on the actual substitutability between these two financial instruments in hedging against the same type of risk and achieving the same investment aims of investors. Such substitutability, without further investigation of customers and competitors of merging exchanges is ambiguous.

"The four largest derivatives exchanges globally (by value of turnover) are the Chicago Mercantile Exchange; Euronext/Liffe; the Chicago Board of Trade; and Eurex." 178 The following tables indicate the market share of the largest exchanges for stock options and stock futures as well as in short term interest rate options and futures. 179

177 Competition Commission Report, supra note 26, para. 4.60.
178 Id. para. 5.11.
179 Annual Report, supra note 99, at 104. The percentages have been calculated based on the total value of trading on all exchanges that a particular derivative is traded.
### Table 7\(^{180}\)

<table>
<thead>
<tr>
<th>Stock Options</th>
<th>2005 Notional Value in US$ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Board Options Exchange</td>
<td>1,264,511 35%</td>
</tr>
<tr>
<td>Eurex</td>
<td>752,434 21%</td>
</tr>
<tr>
<td>Euronext.liffe</td>
<td>618,732 17%</td>
</tr>
<tr>
<td>Sao Paulo SE</td>
<td>392,331 11%</td>
</tr>
<tr>
<td>Australian SE</td>
<td>270,423 7%</td>
</tr>
<tr>
<td>Borsa Italiana</td>
<td>67,776 2%</td>
</tr>
<tr>
<td>Bourse de Montreal</td>
<td>51,498 1%</td>
</tr>
<tr>
<td>Philadelphia SE</td>
<td>49,318 1%</td>
</tr>
</tbody>
</table>

### Table 8\(^{181}\)

<table>
<thead>
<tr>
<th>Stock Futures</th>
<th>2005 Notional Value in US$ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Stock Exchange India</td>
<td>510,701 75%</td>
</tr>
<tr>
<td>Euronext.liffe</td>
<td>64,062 9%</td>
</tr>
<tr>
<td>Borsa Italiana</td>
<td>41,798 6%</td>
</tr>
<tr>
<td>BME Spanish Exchanges</td>
<td>31,708 5%</td>
</tr>
<tr>
<td>JSE</td>
<td>10,100 1%</td>
</tr>
<tr>
<td>Budapest SE</td>
<td>7,842 1%</td>
</tr>
<tr>
<td>Australian SE</td>
<td>5,872 1%</td>
</tr>
</tbody>
</table>

### Table 9\(^{182}\)

<table>
<thead>
<tr>
<th>Short term Interest Rate Options</th>
<th>2005 Notional Value in US$ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Mercantile Exchange</td>
<td>188,001,090 61%</td>
</tr>
<tr>
<td>Euronext.liffe</td>
<td>89,041,892 29%</td>
</tr>
<tr>
<td>Chicago Board of Trade</td>
<td>32,672,935 11%</td>
</tr>
<tr>
<td>Bourse de Montreal</td>
<td>311,501 0%</td>
</tr>
</tbody>
</table>

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\(^{180}\) Id. at 100.

\(^{181}\) Id. at 101.

\(^{182}\) Id. at 104.
Table 10\textsuperscript{183}

<table>
<thead>
<tr>
<th>Short term Interest Rate Futures</th>
<th>(Notional Value: US$ millions-2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Mercantile Exchange</td>
<td>413,781,671 52%</td>
</tr>
<tr>
<td>Euronext.liffe</td>
<td>281,718,123 35%</td>
</tr>
<tr>
<td>Chicago Board of Trade</td>
<td>58,011,410  7%</td>
</tr>
<tr>
<td>SFE Corp.</td>
<td>15,666,591  2%</td>
</tr>
<tr>
<td>MexDer</td>
<td>10,348,810  1%</td>
</tr>
<tr>
<td>Tokyo Financial Exchange</td>
<td>10,200,010  1%</td>
</tr>
<tr>
<td>Bourse de Montreal</td>
<td>8,598,080   1%</td>
</tr>
</tbody>
</table>

As these tables indicate, not all exchanges have a material overlap in these types of derivatives. Thus, not all likely mergers between these exchanges lead to post-merger entities having significant market shares. The same conclusion can be drawn for all types of derivatives.

Competition for derivatives trading can take two forms, as can competition for equities trading:

(1) direct (head-to-head) competition for the same derivatives contract,

(2) threat of head-to-head competition.

In regards to actual competition, not all exchanges are direct competitors for all types of derivatives. For example, there is unlikely to be any significant overlap in index derivatives since derivative products based on national indices are available on the exchanges where the listed equities are traded.

As was the case for equities trading, and was outlined in the beginning of this Article, the possibility of potential competition will depend on the likelihood that liquidity will switch between exchanges. Unless there is an important technological development, a switch in liquidity is unlikely.

Other aspects of competition include the provision of immediacy, price discovery, low price volatility, liquidity, transparency, transaction cost, reputation, quality, innovation, and rules. The provision of derivatives trading entails services such as pre-trade price discovery, trade matching, as well as post-trade management services. Elements of this service competition include trading hours, regional offices, and most importantly, the trading

\textsuperscript{183} Id.
technology. Malkamäki argued that scale economies exist only in the very large exchanges but that there are significant scale economies with respect to the processing of trades. This author also argued that "legislation and interim regulation of stock exchanges, as well as the microstructure of the trading system, are important elements of a liquid and efficient trading environment. It would . . . be optimal to centralize the trading systems so as to maximize scale economies arising in the processing of trading."185

Transaction costs indicate the explicit costs, which include broker commissions and exchange and other fees, effective spreads, as well as the implicit costs of the time required for its settlement. Because investors look for markets with smaller transaction costs, transaction costs are also associated with higher liquidity. Higher liquidity increases the utility of market participants. Transaction costs can have a negative impact on price discovery and volatility.186 Price discovery is the process by which a market attempts to find transaction prices that bear the least risk. Investors prefer markets that have a greater flow of information.187 Technological advancements such as computerized trading systems contribute to cross-border trading. Such advancements also contribute to more efficient trading by minimizing the delays and thus reducing the associated costs and contributing to beneficial spreads. Investors also look for operational efficiency and transparency. They are concerned about facilitation of their transactions (by matching buy and sell orders).188 As the Competition Commission Report mentions,

the extent to which off-book trading of derivatives, or the threat of head-to-head competition by a new derivatives exchange, represent a competitive constraint to an incumbent exchange, turns on . . . [many factors, including]

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185 Id. at 25, 29.
188 See Ramos, supra note 10, at 26 (identifying factors that investors and firms look for in deciding whether to trade or list which exchanges can use to attract volume).
the degree of substitutability between on- and off-exchange trading of derivatives and the responsiveness of trading volumes to increases in exchange fees.\textsuperscript{189}

Off-exchange trading—although a separate market from on-exchange trading—poses a significant competitive constraint on on-exchange trading. Thus, exchanges are likely to take the possibility of OTC trading into account in setting their pricing and innovation strategies. Regarding a shift in liquidity due to an increase in the trading fees, as the Competition Commission Report notes,

network effects make a liquidity shift hard to achieve, and in this sense represent a switching cost for customers. These costs imply that in order for liquidity to shift, the incentives for trading firms have to be substantial. These incentives may take the form of lower trading costs or incentive payments by the entrant exchange. However, for exactly the same reasons, the potential benefits for a competitor to induce such a shift are proportionately higher. Once gained, it will be hard for the incumbent exchange to win these customers back.\textsuperscript{190}

As mentioned above in the analysis of the equities trading market, an important competition factor is technological advancement. Trading fees do not play an important role in trading. Technological advancements contribute to cross-border trading as well as to more efficient trading by minimizing the delays and thus reducing the associated costs and contributing to beneficial spreads. The intensifying competition in the market is due to commitments by regulators of promoting competition, as well as due to advancements in technology. Finally, pressure from customers has also contributed to intensifying competition.

As the above analysis has illustrated, exchanges face strong competitive constraints from OTC trading. In addition, the driving force of competition seems to be technological advancement.\textsuperscript{191}

\textsuperscript{189} \textsc{Competition Commission Report, supra} note 26, para. 4.61.

\textsuperscript{190} \textit{Id.} para. 5.59.

\textsuperscript{191} Stock exchange mergers may have both positive and negative effects on technological advancement. A positive impact involves economies of scale in innovation, whereas the negative impact may include less incentive to innovate, as well as limited ability for competitors to enter the market. An additional essential factor for competition is the post-trade services. Without a unified post-
Improved technology can lead to efficiency in matching and executing orders, to lower trading costs, as well as to an increase in the volume of trading. Competition seems to be strong, and a merger between two of the exchanges may lead to a dampening of this competition in technological advancement. However, not all exchanges are direct competitors for all types of derivatives. Thus, the likely overlaps are likely to be fewer than the types of derivatives available. As regards the threat of head-to-head competition, a significant number of exchanges exist and may pose competitive constraints on each other (e.g., Chicago Mercantile Exchange, Euronext/Liffe, the Chicago Board of Trade, and Eurex).

Turning to the framework of competition assessment, taking into account the fact that the majority of derivatives trading occur OTC, as well as the fact that competition takes place in the form of competition for technological advancement and the existence of a significant number of major exchanges, a merger between two exchanges may not create severe competition concerns. However, as Tables 7, 8, 9, and 10 indicate, on some types of derivatives a potential combination of some of exchanges may lead to a significant market share of the merged entity. In such hypothetical merger situations, a merger between two leading exchanges in these markets may lead to an adverse impact on competition.

This outcome is based on an assessment of the publicly known facts. An investigation by a competition authority may reveal an adverse impact on competition in derivatives trading resulting from a merger between exchanges. Any potential competition concerns may arise as a result of a worsening of the derivative exchange services incorporating innovation, rules, cost reductions and other services.

trade system, users need to net positions against each other, incurring higher costs. However, as mentioned in the introduction of this paper, post-trade services are outside the scope of this paper. Thus, no further analysis will be provided. See id. para. 5.136 (providing a detailed account of the likely impact of mergers on post-trade services).

Assuming that each type of derivative constitutes one separate product market, this is a reasonable assumption to make.

An indicating factor of likely concern may be the market share of the post-merger entity. However, market shares as well as concentration ratios can only provide an initial indication as to the effects of the merger and are not conclusive. In this particular case, market shares may not be a good direct indicator of the market power of exchanges because they will, to a great extent, simply reflect the relative size of the capital markets associated with each exchange.
Bonds are issued by credit institutions, governments, or companies and serve as long-term credit financing for the issuer. Bonds can be classified in different forms, namely, interest rate bonds (floating rate bonds, fixed rate bonds, zero coupon bonds), government issued bonds (government/federal bonds, Eurobonds, emerging market bonds), and private issued bonds (corporate bonds, collateralised mortgage bonds, Tier 1 bonds). Other types of bonds include foreign currency bonds and convertible bonds.

With regards to bonds, this Article will focus on the listing and trading of bonds rather than on post-trade services related to bonds. Bond issuers are likely to list the bonds on the exchange having a significant pool of liquidity. In addition, they are likely to choose exchanges where other bond issuers having similar characteristics to them (e.g., same nationality) have chosen as their listing venue. Government bonds (public sector bonds) are more likely to be listed on national exchanges than foreign exchanges (except the case of developing countries that usually issue sovereign bonds abroad), whereas corporate bonds are likely to be listed both on the domestic as well as on foreign exchanges. It should be noted that once the bond is listed, trading of the bond occurs on a multitude of on-exchange as well as off-exchange platforms, irrespective of the listing exchange.

The relevant product frame of reference may include both government and corporate bonds. Further investigation will be needed by competition authorities, with respect to the substitutability between these two types of bonds, in order to determine whether the market for the listing of bonds should include both government and corporate bonds. This Article attempts to address the issues that are likely to determine the product and geographic frame of reference.

In Europe, the bond market is dominated by government bonds and bonds issued by financial intermediaries. Researchers at The Center for Economic Policy Research write, "In the United States, the proportion of bonds issued by the non-financial corporate sector is much larger. In addition, municipal bonds and agency bonds are major components of this market."194  The

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following table indicates the top exchanges according to the value of bond listings.

**TABLE 11: TRADING OF BONDS IN US$ MILLIONS, 2005**

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>Total</th>
<th>Domestic Private Sector</th>
<th>Domestic Public Sector</th>
<th>Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxembourg SE</td>
<td>6,655,030</td>
<td>184,102</td>
<td>322</td>
<td>6,470,606</td>
</tr>
<tr>
<td>Osaka SE</td>
<td>4,807,650</td>
<td>12,177</td>
<td>4,795,472</td>
<td>0</td>
</tr>
<tr>
<td>Tokyo SE</td>
<td>4,730,812</td>
<td>15,693</td>
<td>4,715,119</td>
<td>0</td>
</tr>
<tr>
<td>London SE</td>
<td>2,574,316</td>
<td>1,041,935</td>
<td>633,820</td>
<td>898,561</td>
</tr>
<tr>
<td>Borsa Italiana</td>
<td>1,978,524</td>
<td>69,536</td>
<td>1,371,676</td>
<td>537,312</td>
</tr>
<tr>
<td>NYSE</td>
<td>968,029</td>
<td>160,381</td>
<td>744,697</td>
<td>62,951</td>
</tr>
<tr>
<td>Korea Exchange</td>
<td>714,295</td>
<td>106,150</td>
<td>607,893</td>
<td>252</td>
</tr>
<tr>
<td>OMX</td>
<td>686,294</td>
<td>442,192</td>
<td>244,102</td>
<td>n/a</td>
</tr>
<tr>
<td>Swiss Exchange</td>
<td>368,633</td>
<td>91,223</td>
<td>102,615</td>
<td>174,795</td>
</tr>
<tr>
<td>National Stock Exchange India</td>
<td>344,223</td>
<td>10,917</td>
<td>333,207</td>
<td>99</td>
</tr>
<tr>
<td>Singapore Exchange</td>
<td>245,460</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Wiener Börse</td>
<td>223,345</td>
<td>73,707</td>
<td>141,053</td>
<td>8,585</td>
</tr>
<tr>
<td>Athens Exchange</td>
<td>211,046</td>
<td>1,897</td>
<td>209,150</td>
<td>0</td>
</tr>
<tr>
<td>Istanbul SE</td>
<td>187,537</td>
<td>0</td>
<td>187,537</td>
<td>0</td>
</tr>
<tr>
<td>Shanghai SE</td>
<td>181,589</td>
<td>16,940</td>
<td>164,648</td>
<td>0</td>
</tr>
<tr>
<td>Buenos Aires SE</td>
<td>105,531</td>
<td>3,548</td>
<td>99,495</td>
<td>2,488</td>
</tr>
<tr>
<td>Taiwan SE Corp.</td>
<td>95,720</td>
<td>6</td>
<td>95,653</td>
<td>61</td>
</tr>
<tr>
<td>Warsaw SE</td>
<td>88,386</td>
<td>52</td>
<td>87,987</td>
<td>347</td>
</tr>
<tr>
<td>Australian SE</td>
<td>85,861</td>
<td>38,659</td>
<td>47,202</td>
<td>n/a</td>
</tr>
<tr>
<td>Tel Aviv SE</td>
<td>79,710</td>
<td>22,899</td>
<td>56,811</td>
<td>0</td>
</tr>
<tr>
<td>Oslo Børs</td>
<td>74,187</td>
<td>35,037</td>
<td>38,571</td>
<td>578</td>
</tr>
<tr>
<td>Colombia SE</td>
<td>56,200</td>
<td>16,933</td>
<td>38,513</td>
<td>755</td>
</tr>
<tr>
<td>Hong Kong Exchanges</td>
<td>55,464</td>
<td>9,639</td>
<td>23,118</td>
<td>22,707</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,759,704</strong></td>
<td><strong>2,425,582</strong></td>
<td><strong>14,907,858</strong></td>
<td><strong>8,180,803</strong></td>
</tr>
</tbody>
</table>

Total represents all exchanges listed, not only those included in this list.

1 The total figures for domestic public sector, domestic private sector and foreign do not sum to the value for the total, since for some exchanges (OMX or Singapore), no specific values exist for these three categories.

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As Table 11 illustrates, exchanges receive listings of both domestic public and private sector bonds, as well as of foreign bonds. However, not all exchanges receive listings of foreign bonds. From the top 23 exchanges receiving bonds listing, only in five of them do foreign bonds listings represent more than 25% of the total value of bonds listed. The majority of the value of listed bonds represents domestic bonds in all cases except for the Luxembourg Stock Exchange.

This table indicates that domestic public sector bond issuers tend to list on the domestic exchange, which may not be the case for domestic private bond issuers. Thus, a degree of home bias is indicated for domestic public sector bond issuers. Thus, the geographic frame of reference is likely to be national.

As regards the listing of private sector bonds, in the majority of these exchanges, the value of the public sector-listed bonds is higher than the value of private sector listed bonds. This indicates a tendency of private sector bonds being listed outside the domestic market. Since not all exchanges receive listings of foreign bonds, the geographic frame of reference for the listing of private sector bonds may include certain exchanges (e.g., Luxembourg Stock Exchange, LSE, Borsa Italiana, Swiss Stock Exchange). The above analysis indicates that the geographic frame of reference is likely to be regional/international.

As the European Central Bank states, "[t]he growing importance of the euro as an international investment currency has made the market for euro-denominated issues more attractive for both investors and issuers." Thus, a regional "Euro-zone" geographic frame of reference may be relevant for both public and private sector bonds of "Euro-zone" countries.

Assuming that the listing of private sector bonds constitutes a separate market from the listing of public domestic bonds, further investigation is needed to confirm whether national exchanges can constitute the geographic frame of reference for the listing of government bonds. Investigation is also needed to determine

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196 This is true assuming that the total value of domestic public sector bonds is not much higher than the figures of this table. In addition, the assumption is made that the total value of domestic private sector bonds is higher than the values indicated in the table. If any of these assumptions is not satisfied, then the product frame of reference may not be the one alleged above.

whether the geographic frame of reference for the listing of private sector bonds can include regional and/or transnational exchanges. A more complete analysis of the degree to which domestic public sector bonds are listed on the domestic exchange as well as of the degree of "non-domestic" listings of private sector bonds will shed light on the relevant geographic frames of reference.

If the frame of reference can be defined in these terms, then any cross-border exchange merger is unlikely to have any impact on competition, since domestic exchanges are complementary as far as the listing of public sector bonds is concerned. Regarding the listing of corporate bonds, under a regional (or even international) geographic frame of reference, certain permutations of mergers between two or more of the above exchanges are likely to have a significant anticompetitive impact.

If the product frame of reference includes both public and private sector bonds, then the geographic market is likely to be regional/international, since private sector bonds are more likely to list outside the national market. As mentioned above, a regional geographic frame of reference may include, inter alia, the Luxembourg Stock Exchange, LSE, Borsa Italiana, and the Swiss Stock Exchange.

As mentioned above, trading of bonds occurs on a multitude of on-exchange as well as off-exchange platforms, irrespective of the listing exchange. Although the Luxembourg Stock Exchange has the largest value of bonds listed, it is not in the top 19 trading exchanges with regards to bond trading, as the following table indicates.

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198 A further segmentation may be made into trading by institutional investors (wholesale trading) and trading by private investors (retail level). This segmentation is not addressed in this Article further, but may constitute the subject of an investigation by competition authorities.
TABLE 12: TRADING OF BONDS IN US$ MILLIONS, 2005\textsuperscript{199}

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>Total</th>
<th>Domestic Private Sector</th>
<th>Domestic Public Sector</th>
<th>Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME Spanish Exchanges</td>
<td>4,092,371</td>
<td>1,081,704</td>
<td>3,010,667</td>
<td>0</td>
</tr>
<tr>
<td>OMX</td>
<td>3,100,531</td>
<td>1,419,412</td>
<td>1,678,764</td>
<td>2,355</td>
</tr>
<tr>
<td>London SE</td>
<td>3,008,686</td>
<td>30,808</td>
<td>2,946,850</td>
<td>31,028</td>
</tr>
<tr>
<td>Istanbul SE</td>
<td>531,063</td>
<td>0</td>
<td>531,063</td>
<td>0</td>
</tr>
<tr>
<td>Colombia SE</td>
<td>472,518</td>
<td>55,186</td>
<td>416,565</td>
<td>747</td>
</tr>
<tr>
<td>Deutsche Börse</td>
<td>381,053</td>
<td>64,737</td>
<td>276,096</td>
<td>40,219</td>
</tr>
<tr>
<td>Korea Exchange</td>
<td>355,088</td>
<td>1,894</td>
<td>353,194</td>
<td>0</td>
</tr>
<tr>
<td>Euronext</td>
<td>176,179</td>
<td>n/a</td>
<td>112,888</td>
<td>63,311</td>
</tr>
<tr>
<td>Borsa Italiana</td>
<td>154,241</td>
<td>12,163</td>
<td>136,475</td>
<td>5,603</td>
</tr>
<tr>
<td>Swiss Exchange</td>
<td>149,334</td>
<td>25,418</td>
<td>38,695</td>
<td>85,220</td>
</tr>
<tr>
<td>National Stock Exchange</td>
<td>138,203</td>
<td>3,309</td>
<td>134,828</td>
<td>66</td>
</tr>
<tr>
<td>India</td>
<td>128,828</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Oslo Børs</td>
<td>100,233</td>
<td>22,760</td>
<td>77,348</td>
<td>124</td>
</tr>
<tr>
<td>Tel Aviv SE</td>
<td>72,957</td>
<td>11,681</td>
<td>61,276</td>
<td>0</td>
</tr>
<tr>
<td>Shanghai SE</td>
<td>39,346</td>
<td>5,458</td>
<td>33,889</td>
<td>0</td>
</tr>
<tr>
<td>Buenos Aires SE</td>
<td>34,086</td>
<td>1,245</td>
<td>32,840</td>
<td>1</td>
</tr>
<tr>
<td>Irish SE</td>
<td>31,780</td>
<td>n/a</td>
<td>31,780</td>
<td>n/a</td>
</tr>
<tr>
<td>Singapore Exchange</td>
<td>6,734</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Tokyo SE</td>
<td>6,076</td>
<td>6069</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Total\textsuperscript{1}</td>
<td>13,003,334</td>
<td>2,751,310</td>
<td>9,885,032</td>
<td>231,223</td>
</tr>
</tbody>
</table>

Total represents all exchanged listed, not only those included in this list.
\textsuperscript{1} The total figures for domestic public sector, domestic private sector and foreign do not sum to the value for the total, since for some exchanges (OMX or Singapore) no specific values exist for these three categories.

Thus, the geographic frame of reference for bond trading is not confined to national boundaries. Bonds are likely to be traded on exchanges that can provide sufficient liquidity. As the ECB Report stated, the key element behind the development of the European

\textsuperscript{199} ANNUAL REPORT, supra note 99, at 92.
bond market was the impetus for a better integrated and more liquid market.200 "Liquid bond markets bring transaction costs down for investors, who therefore achieve greater gains . . . and minimize the cost of funds to firms."201 Competition is a key driver of liquidity, so public policy should focus on openness and competition. In addition, trading of a particular bond is likely to take place on exchanges where other bonds having similar characteristics (e.g., same nationality) are traded. One particular characteristic may be the currency; thus, a possible geographic frame of reference may be regional, comprising bonds traded in the same currency (e.g., Eurozone).202 Improved access to financial markets within the EU allows investors to diversify their portfolios and invest more easily in foreign markets. Thus, investors are likely to trade on exchanges other than their domestic one. Thus, the geographic reference is likely to be at least regional (or even international).

Assuming the frame of reference is defined as the trading of bonds at a regional geographic reference, any merger between stock exchanges from different regions is unlikely to lead to competition concerns, since there will be no overlap between the activities of exchanges of different regions. If the geographic reference is international, then certain permutations of mergers between two or more of the above exchanges are likely to have a significant anticompetitive impact.

An important factor in the assessment of the impact of competition on the market for bond trading is the extent of bond trading that occurs OTC. The ECB Report emphasizes the importance of OTC trading in bonds. It argues that “[t]he secondary market activity traditionally takes place in the wholesale [OTC] market.”203 “The euro-denominated bond secondary market has been characterized by the growing use of multilateral electronic trading systems . . . . [Such systems have] lower costs, higher liquidity, transparency and easier cross-border trading. This trend was clearly visible in the more homogenous and liquid

200 EUROPEAN CENTRAL BANK, supra note 197, at 5.
201 BIAIS, ET AL., supra note 194, at 1.
202 The ECB Report stated that “since many investors prefer assets denominated in local currency, the introduction of the euro has reduced the home bias of euro area investors and further promoted the diversification of investments within the euro area.” EUROPEAN CENTRAL BANK, supra note 197, at 5.
203 EUROPEAN CENTRAL BANK, supra note 197, at 21.
government bond sector."\textsuperscript{204} The European Central Bank also states that due to "the large size of the OTC bond market, competition among trading markets caused the proliferation of new trading platforms [including] regulated markets and alternative trading systems ("ATSs").\textsuperscript{205} A report by the Centre for Economic Policy Research ("CEPR") also states that the corporate bonds are mostly traded OTC.\textsuperscript{206} Thus, OTC poses a significant competitive constraint on the provision of bond trading services by exchanges. However, it is unlikely that OTC and on-exchange trading will constitute one single market, since these two types of trading satisfy different needs.

In assessing the impact of a merger between two of the above exchanges on competition, it should be noted that OTC trading is a very important factor in the trading of bonds. The mere impact of OTC bonds trading mitigates the severity of anticompetitive effects on the market for the trading of bonds, since it is likely to exert significant competitive constraints on on-exchange trading.

In some jurisdictions, the impact of a merger on the bond trading market is unlikely to be important due to the fact that the vast majority of bond trading occurs OTC. As the Competition Commission argued, nearly 100 percent of bond trading in the United Kingdom takes place off-book.\textsuperscript{207} In such cases, any merger between cross-border exchanges is unlikely to induce any materially adverse impact on competition, due to the lack of on-exchange bond trading.

9. MARKET INFORMATION SERVICES AND INFORMATION TECHNOLOGY SERVICES

Listing and trading is dependent upon detailed information about the exchange, its returns, etc. Exchanges provide to end-users and to third party data vendors proprietary market information—information which is generated on an exchange—such as real-time pricing data and trading volume data, and non-proprietary market information such as indices and historical information.\textsuperscript{208}

\textsuperscript{204} Id. at 30–31.
\textsuperscript{205} Id. at 31.
\textsuperscript{206} Biais, et al., supra note 194, at 2.
\textsuperscript{207} Competition Commission Report, supra note 26, para. 2.4.
\textsuperscript{208} Id. para. 4.74.
According to the Competition Commission Report, "[a]n exchange is the sole provider of its proprietary market information, [and such] information is not necessarily substitutable for market information from another exchange."\(^{209}\) It is likely that non-proprietary market data is part of a wider financial services data market.\(^{210}\) In such a wide market, there are a multitude of providers of such information. Stock exchanges and financial services companies, such as Reuters and Bloomberg, provide non-proprietary information. Thus, the geographic frame of reference is likely to be worldwide.

With respect to proprietary information, there is no overlap amongst the different exchanges. A merger between stock exchanges is unlikely to lead to any competition concerns due to the lack of overlap. As regards non-proprietary information, due to the large number of providers of such information, a merger between stock exchanges is unlikely to lead to any competition concerns.\(^{211}\)

Turning to the market for information technology services, such services relate to the development and provision of software for electronic trading as well as for clearing and settlement. OMX\(^{212}\) states that it is the world's largest provider of technology solutions for securities trading, with a customer base that currently encompasses more than 60 exchanges, clearing organizations, and central securities depositories in more than 50 countries.\(^{213}\) In order to strengthen its offering to marketplaces, OMX acquired Computershare's Markets Technology operations. According to OMX, the combination of OMX and Computershare's product portfolios will have the effect of substantially expanding their offering to global exchanges.\(^{214}\)

Accenture, which is a global management consulting,
outsourcing, and technology services company, established itself as a leader in the global marketplace. It assists capital markets in offloading non-distinctive corporate and securities operations. Accenture transformed how trading operations are executed and how information is disseminated among investors. Some of its customers include the LSE, Hong Kong Stock Exchange, Johannesburg Stock Exchange, as well as DTCC, which is the world's largest securities clearing, settlement, and servicing organization.215

Tata Consultancy Services Limited ("TCS") is one of the world's leading information technology consulting, services, and business process outsourcing organization. TCS has developed IT solutions for over 500 customers all over the world. One of its clients is the Bombay Stock Exchange.216

Thus, from the examples included above, it can be concluded that the relevant geographic frame of reference is likely to be global. Several companies provide exchange-related IT services.

As was the case for non-proprietary information, due to the existence of a multitude of companies providing IT services to exchanges, on a global scale, any competition concerns as a result of a merger between exchanges are unlikely to occur. However, if the merger involves exchanges which hold shares in providers of exchange-related IT services (e.g., OMX), then competition concerns may arise. Such a conclusion needs to be based on a careful assessment of the impact of such a merger.

10. CONCLUSION

It would be useful to present the benefits of financial integration. London Economics prepared a report for the European Commission on the integration of EU financial markets. In that report, it argued that:

Through a more open and effective European financial market a number of benefits are expected for both investors and the corporate sector. Investors will benefit from higher risk-adjusted returns on savings, through enhanced


opportunities for portfolio diversification and more liquid and competitive capital markets. The corporate sector will benefit from generally easier access to financing capital. Competition in the financial intermediation sector will offer corporations a wider range of financial products at attractive prices. \textsuperscript{217}

In particular, regarding equity markets, trading costs could fall sharply as a result of full European financial market integration. As regards corporate bond markets, financial market integration will result in a deeper and more liquid market and should lead to further reductions in the credit spread (or risk spread relative to a comparable risk-free security) required by investors.

Some permutations of mergers may induce competitive harm and thus lead to a post-merger market characterized by a lower degree of competition. This would lower the degree of innovation as well as the improvement of exchange services. As the London Economics Report states, "competition in the financial intermediation sector will offer corporations a wider range of financial products at attractive prices." \textsuperscript{218}

It should be emphasized that sound and effective regulation is the key to the development and integration of stock exchanges in the global market. Effective regulation will provide confidence and attract investors, allowing stock exchanges to grow and interact. However, there is no single regulation structure that will be suitable to all countries. \textsuperscript{219} Each country has to develop the regulatory structure that best suits its need, taking into account historical, cultural, political, social, and economic issues.

The burden falls on competition/regulation authorities to ensure that effective and sufficient competition remains after any consolidation in the stock exchange industry.

\textsuperscript{217} \textsc{London Economics, Quantification of the Macro-Economic Impact of Integration of EU Financial Markets i (2002) available at http://ec.europa.eu/internal_market/securities/docs/studies/summary-londonecon_en.pdf.}

\textsuperscript{218} \textit{Id.}

\textsuperscript{219} Abrams & Taylor, \textit{supra} note 32, at 27.