In this appendix, we summarize the current state of many of the major non–U.S. exchanges by the major regions of the world: Europe, Asia, and the Americas (excluding the United States). Table 18-2 provides basic data on these exchanges: domestic market capitalization; total value of share trading; number of listed companies; and the exchange broad stock indexes.

### Table 18-2 Non–U.S. Exchange Data as of December 2007

<table>
<thead>
<tr>
<th>Stock Exchange</th>
<th>Domestic Market Capitalization (in millions of U.S.$)</th>
<th>Total Value of Share Trading in 2007 (in millions of U.S.$)</th>
<th>Number of Listed Companies (Domestic plus Foreign)</th>
<th>Broad Stock Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Securities Exchange</td>
<td>$1,298,315.0</td>
<td>$1,378,520.0</td>
<td>1,998</td>
<td>All Ordinary Price</td>
</tr>
<tr>
<td>BME Spanish Exchanges</td>
<td>1,781,132.7</td>
<td>2,970,6160</td>
<td>3,537</td>
<td>IGBM Index (Madrid)</td>
</tr>
<tr>
<td>Bolsa de Valores do Sao Paulo—BVSP</td>
<td>1,369,711.3</td>
<td>607,558.2</td>
<td>404</td>
<td>Ibovespa</td>
</tr>
<tr>
<td>Bolsa Mexicana de Valores</td>
<td>397,724.6</td>
<td>123,907.7</td>
<td>367</td>
<td>IPC</td>
</tr>
<tr>
<td>Bombay Stock Exchange Ltd.</td>
<td>1,819,100.5</td>
<td>347,681.8</td>
<td>4,887</td>
<td>SENSEX</td>
</tr>
<tr>
<td>Borsa Italiana SPA</td>
<td>1,072,534.7</td>
<td>2,311,826.9</td>
<td>407</td>
<td>MIB Hist. Price</td>
</tr>
<tr>
<td>Bourse de Montreal</td>
<td>-</td>
<td>-</td>
<td>866</td>
<td>CDAX Price</td>
</tr>
<tr>
<td>Deutsche Borse AG</td>
<td>2,105,197.8</td>
<td>4,323,675.4</td>
<td>1,421</td>
<td>S&amp;P/ HKEX Large Cap Index</td>
</tr>
<tr>
<td>Hong Kong Exchanges and Clearing</td>
<td>2,654,416.1</td>
<td>2,138,698.5</td>
<td>3,107</td>
<td>FTSE All Share</td>
</tr>
<tr>
<td>London Stock Exchange</td>
<td>3,851,705.9</td>
<td>10,324,334.6</td>
<td>3,307</td>
<td>Nasdaq Composite</td>
</tr>
<tr>
<td>Nasdaq Stock Market</td>
<td>4,013,650.3</td>
<td>15,320,133.4</td>
<td>3,069</td>
<td>S&amp;P CNX 500</td>
</tr>
<tr>
<td>National Stock Exchange of India Ltd.</td>
<td>1,660,096.9</td>
<td>761,074.1</td>
<td>1,330</td>
<td>OMXC (Copenhagen)</td>
</tr>
<tr>
<td>NYSE Euronext</td>
<td>15,650,832.5</td>
<td>29,309,971.2</td>
<td>2,273</td>
<td>NYSE Composite</td>
</tr>
<tr>
<td>OMX Nordic Exchange</td>
<td>1,242,577.9</td>
<td>1,863,306.8</td>
<td>850</td>
<td>OMXC (Copenhagen)</td>
</tr>
<tr>
<td>Osaka Securities Exchange</td>
<td>212,178.5</td>
<td>264,434.4</td>
<td>477</td>
<td>300 Common</td>
</tr>
<tr>
<td>Shanghai Stock Exchange</td>
<td>3,694,348.0</td>
<td>4,070,072.4</td>
<td>860</td>
<td>SSE Composite Index</td>
</tr>
<tr>
<td>Singapore Exchange</td>
<td>539,176.6</td>
<td>381,622.3</td>
<td>762</td>
<td>All Share</td>
</tr>
<tr>
<td>Tokyo Stock Exchange Group, Inc</td>
<td>4,330,921.9</td>
<td>6,475,765.1</td>
<td>2,414</td>
<td>TOPIX</td>
</tr>
<tr>
<td>TSX Group</td>
<td>2,186,550.2</td>
<td>1,648,617.1</td>
<td>3,951</td>
<td>S&amp;P/TSX Composite</td>
</tr>
</tbody>
</table>

As with U.S. exchanges, there have been four similar trends for non–U.S. exchanges. First, exchanges have demutualized and then become public companies. Most of the remaining few that have not are likely do so in the near future. Second, floor trading has been replaced by electronic trading. There are not many trading floors left in the world. And even where trading floors remain, there is often a choice between floor execution and electronic execution, with electronic execution being dominant. Third, exchanges have become international, that is, not limited to a single country. Finally, exchanges have become multi-asset class exchanges, trading both cash instruments (bonds as well as stocks) and derivatives.

**EUROPE**

The major European exchanges that we describe below are

* Deutsche Borse
* LSE/AIM
* Euronext
* OMX
* Madrid Stock Exchange (Bolsa de Madrid)

**Deutsche Borse AG**

The Deutsche Borse (DB) AG organizes and operates marketplaces for trading equity shares, derivatives, and other securities, as well as providing transactions services. DB is largely owned by international and German banks, official ledger brokers (Kursmakler and Freimakler), and the other regional German stock exchanges.

The DB owns and operates two exchanges: (1) the Frankfurt Stock Exchange, and (2) the Eurex (European Exchange). The Frankfurt Stock Exchange (FWD Frankfurter Westpapierbourse), denoted by FWD but commonly referred to as the FSE, is not only the largest stock exchange in Germany but is one of the world’s largest stock exchanges. In January 1990, the DB formed the Deutsche TerminBorse, the German Financial Futures and Options Exchange (DTB), a fully computerized exchange for trading equity options and futures. In 1998, the DTB and the Swiss Options and Financial Futures Exchange (SOFFEX) merged to form the world’s derivatives exchange, Eurex. This became one of the first exchanges providing access to derivatives via fully electronic trading and clearing platforms. In addition to the two exchanges, DB owns Clearstream, which provides clearing and settlement services.

In 1997, DB introduced a new electronic trading system, Exchange Electronic Trading (Xetra). Xetra is a modern, cost-efficient, order-driven trading system with automatic matching, which brings together wholesale and retail trading in a central order book. Limit and market orders can be entered with various validity constraints, trading limits, and conditions for execution, and can be kept in the order book for up to one year. The order book, which is basically transparent, is designed to give all market participants the opportunity to react quickly to changes in the market while preserving their anonymity. In addition to its use by DB, Xetra is used by other non–German exchanges throughout the world. Although a large share of DB’s trading is conducted electronically via Xetra, it nevertheless maintains the FSE trading floor for a small number of trades, and to the public the floor remains the “face” of DB.


**London Stock Exchange**

The LSE has traditionally been one of the world’s major exchanges. It was founded in 1801 and has had international listings as well as British listings. The LSE became a public company in July 2001 (ticker symbol: LSE), listing its shares on its own exchange.

A critical time in the LSE’s history occurred during 1986 with the so-called “Big Bang,” which significantly changed the way the exchange operated. The Big Bang reforms related to the LSE included the abolition of minimum commissions and the introduction of “dual capacity” whereby member firms could be both brokers (agents) and “jobbers” (the British term for dealers who are principals in a transaction). One outcome of these and other changes was that the LSE’s trading floor was closed and replaced by “screen trading,” that is, a dealer OTC market.

In October 1997, the introduction of the new order book transformed the method by which the FTSE 100 shares, the major U.K. stock index, are traded. Under the new system (called the Stock Exchange Trading Service, or SETS), when bid and offer prices match, orders are
automatically executed against one another on the screen. Shares outside the FTSE 100 are traded using the quote-driven trading structure introduced during the Big Bang. This system is based on the competing market-maker system. Throughout the trading day, registered market-makers are obliged to display to the market their bid and offer prices and the corresponding maximum sizes. These quotes are displayed on the exchange’s Stock Exchange Automated Quotations (SEAQ) bulletin board.

Traditional trading on the LSE occurs on the Main Market. In 1995, the LSE launched the Alternative Investment Market (AIM), which is a submarket of the LSE. AIM permits smaller companies to have their shares trade via a more flexible regulatory system. As of May 2008, there were 2,200 companies that had shares listed. In AIM, there is less regulation and there are no requirements for capitalization or number of shares listed. Some companies begin on the AIM and move to the Main Market, but many more have transferred from the Main Market to AIM. AIM has also become an international exchange; as of the end of 2005, over 270 foreign corporations had become active on the AIM. Many of these AIM listings are due to its lower regulatory burden. An important aspect of AIM’s regulatory approach is a set of principle-based rules based on comply-or-explain options that permit each company to either comply with AIM’s relatively few rules or explain why it has not complied with them.

AIM has continued to grow via both domestic and international firms.

Euronext

Euronext N.V. was a pan-European stock exchange based in Paris that was formed in September 2000 in a merger of the Amsterdam Stock Exchange, the Brussels Stock Exchange, and the Paris Bourse. In December 2001, Euronext acquired the London International Financial Futures and Options Exchange (LIFFE), which operates independently from Euronext and is called the Euronext LIFFE. All derivatives trade on LIFFE’s electronic trading platform, LIFFE CONNECT. In 2002, Euronext merged with the Portuguese Stock Exchange, which was renamed Euronext Lisbon.

As indicated in the chapter, the merger between the NYSE Stock Exchange and Euronext was approved in April 2007, resulting in the NYSE Euronext, which is the first global stock exchange.

OMX

OMX (also called OMX Nordic Exchange) is a Swedish-Finnish financial services company formed via a merger between OM AB and HEX plc (Helsinki Stock Exchange) in September 2003. In August 2004, the name of this merged company was changed to OMX. During February 2008, Nasdaq acquired OMX and the combined exchange was renamed Nasdaq OMX Group.

OMX has two divisions, the first called OMX Exchanges, which operates eight stock exchanges in the Nordic and Baltic countries. OMX Exchanges are all electronic; that is, there are no trading floors. The second division, called OMX Technology, develops and provides transaction services used by exchanges, both OMX’s exchanges and other exchanges. OMX provides trading systems to over 60 exchanges internationally. These transactions services include trading systems and a regulatory body.

Madrid Stock Exchange (Bolsa de Madrid)

Spain has four regional stock exchanges located in Madrid, Barcelona, Valencia, and Bilbao, which trade equities, convertible bonds, and fixed-income securities. The combination of the four exchanges is called the BME Spanish Exchange. The Madrid Stock Exchange (Bolsa de Madrid), the largest and most international of the four, was founded in 1831.

ASIA

The major Asian exchanges that we describe below are

- Tokyo Stock Exchange
- Osaka Stock Exchange
- Australian Stock Exchange
- Hong Kong Stock Exchange
- Singapore Exchange
- Shanghai Stock Exchange
- Bombay Stock Exchange
- National Stock Exchange of India

Tokyo Stock Exchange

The Tokyo Stock Exchange (TSE) was established in May 1878 and is the second largest exchange in the world by market value. During the 1980s, the Japanese
securities market changed substantially, with rapid deregulation and globalization. Its trading floor was closed in April 1999, and it converted entirely to electronic trading. Stocks listed on the TSE are divided into the First Section for large companies (1,721 companies as of March 2006); the Second Section for mid-sized companies (489 companies); and the “Mothers” Section for start-up high-growth companies (156 companies).

Until the late 1970s, Japan's financial markets were highly regulated. In November 1996, Japan's prime minister proposed the Japanese version of the Big Bang to engage in significant financial market reform with the goal of revitalizing the Japanese financial market and making Tokyo competitive with New York and London by 2001. The Japanese Big Bang was partially a response to two factors. The first was the increasing internationalization of the financial markets and Japan's inability to compete. The second was the bursting of the Japanese asset bubble in stocks and real estate from 1990 to 1995.

In general, the goals of the Big Bang were for the Japanese financial markets to be “fair, free, and global.” More specifically, the four general goals of the Big Bang reforms were to develop

1. a free market that employs market principles
2. a fair and transparent market
3. a market that is global
4. a market that is less susceptible to domestic political pressures

More pragmatically, the Big Bang intended to lower the barriers separating banks, securities companies, and insurance companies, and to ease the regulation of the products financial companies offered and the fees they could charge. These Big Bang developments continue to evolve.

Osaka Securities Exchange

Although the Osaka Stock Exchange (OSE) dates to June 1878, the modern OSE was established in April 1949. The OSE is Japan's leading derivative exchange. While the TSE deals mainly in cash stocks, the OSE specializes in derivatives (futures and options). In December 1997, the trading floor for stocks was closed and trading was converted entirely to a computer-assisted trading system.

Australian Securities Exchange

The Australian Stock Exchange (ASX) was the result of the merger of the Australian Stock Exchange and the Sydney Futures Exchange in December 2006. The ASX no longer has a trading floor and is entirely electronically traded. It operates two vertically integrated trading, clearing, and settlement systems: one for equity and related equity derivative products, and the other for a group of interest rate, equity and commodity futures, and options on futures.

Hong Kong Stock Exchange

In 2000, the Stock Exchange of Hong Kong Limited, the Hong Kong Futures Exchange Limited, and the Hong Kong Securities Clearing Company merged to become the Hong Kong Stock Exchange (HKSE). This exchange is Asia's second largest stock exchange behind only the TSE.

Singapore Exchange Limited

The Singapore Exchange Limited (SGX) was formed on December 1, 1999, from the merger of two established exchanges, the Stock Exchange of Singapore (SES) and the Singapore International Monetary Exchange (SIMEX). The SGX is an integrated securities and derivatives exchange.

Since there are a limited number of public companies in Singapore, SGX looks to other parts of the world for alliances. Among their actual or prospective alliances are the following: (1) it acquired a 5% strategic alliance in the Bombay Stock Exchange; (2) in 2007, the TSE purchased a 4.99% stake in SGX and is discussing other areas of mutual interest; and (3) the LSE considers SGX a major strategic partner in Asia and is planning to take a large stake in the SGX.

Shanghai Stock Exchange

Although the Shanghai Stock Exchange (SSE) dates to 1866, the current exchange began operations at the end of 1990. The SSE is much larger than any other exchange on mainland China, the second largest exchange on mainland China being the Shenzhen Stock Exchange. The largest exchange in China, which is not on the mainland, is the HKSE.

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1 The Japanese Big Bang was known locally as “Kinyu biggo ban,” literally “financial big bang.”
The SSE is not a publicly owned exchange but is a nonprofit organization administered by the China Securities Regulatory Commission (CSRC).

Prior to February 2001, the Chinese stock market was divided into two types: (1) A shares, which were restricted to Chinese investors; and (2) B shares, which were reserved for foreign (non-Chinese) investors. The A share market was denominated in Chinese yuan (which were nonconvertible) and was much larger than the B share market. While very large, the A share market was primarily limited to state-owned companies; private companies have very limited access to the larger A share market. The B share market was started in 1991 to give private companies and entrepreneurs access to foreign capital (although there are government listing requirements) and to give foreigners with hard currency the opportunity to invest in Chinese companies. Shanghai B shares are quoted in U.S. dollars and Shenzhen B shares are quoted in Hong Kong dollars, although these two currencies are linked. The B share market, however, never developed and grew as the Chinese government intended. In fact, B share trading was not dominated by foreigners but by Chinese using various trading strategies. Another indication of the lack of success of the B share market was that the prices of the few companies listed on both the A and B share markets were considerably higher on the A share market.

In addition, Chinese disclosure and accounting standards, which foreign investors have deemed inadequate, led to offerings of Chinese shares in Hong Kong (called H shares). As a result of these failings in the B share market and China’s increasing participation in the global markets of all types, several reforms were instituted in early 2001. However, these reforms permitted foreign investors to trade A shares, with some limitations under a Qualified Foreign Institutional Investor (QFII) system. The Chinese government also legalized Chinese ownership of B shares and Chinese investors were allowed to transfer foreign currencies into a trading account under new rules by the CSRC to fund these purchases. All Chinese companies, private and state-owned, were permitted to sell either A or B shares. In fact, these changes have caused, to some degree, an amalgamation of the Class A, B, and H markets.

**Bombay Stock Exchange**

The Bombay Stock Exchange (BSE), also called the Mumbai Stock Exchange, was founded in 1875 and lists stocks of approximately 4,800 Indian companies (more stocks than any exchange in the world). The BSE was a traditional floor trading exchange but changed to electronic trading after the onset of the National Stock Exchange of India, which will be discussed next. The SGX has a 5% strategic investment in the BSE and Deutsche Borse also has a strategic partnership with the BSE.

**National Stock Exchange of India**

Although the BSE was India’s historic exchange, the National Stock Exchange of India (NSE) now has a large share of India’s trading volume, as shown in Table 18-2. The NSE was recognized as a stock exchange by the Indian government in 1993. The Equities (or Capital Market) of the NSE began operations in mid 2000. The NSE is based in Mumbai (or Bombay). It is mutually owned by a group of banks, insurance companies, and other financial institutions. The NYSE and Goldman Sachs own strategic stakes in the NSE.

The NSE was the first national electronic limit order book that traded securities in India. The BSE subsequently converted to this “NSE model.” NSE also set up India’s first clearing corporation, the National Securities Clearing Corporation, Ltd.

**THE AMERICAS (EXCLUDING THE UNITED STATES)**

The three non–U.S. stock exchanges in the Americas that we will review are the Toronto Stock Exchange/Montreal Stock Exchange, the Mexican Stock Exchange, and the Sao Paulo Stock Exchange.

**Toronto Stock Exchange and Montreal Exchange**

The Toronto Stock Exchange dates to 1852. This exchange, now abbreviated TSX but abbreviated TSE until its IPO in 2001, is Canada’s largest stock exchange. In April 1997, the TSE closed its trading floor, converting to a floorless, electronic trading environment.

The Montreal Exchange (previously the Montreal Stock Exchange), which dates to 1832, trades futures
and options. The change in name occurred in 1982 to reflect the fact that futures and options were becoming more important to it than stocks.

During 1999, there was a fundamental realignment among the four Canadian exchanges, including the Toronto Stock Exchange and Montreal Exchange, to reflect the changes in market specialization. These changes were intended to remain for 10 years. According to this realignment the TSE would be Canada's only exchange for large (senior) equities. The Montreal Exchange assumed the position of the Canadian Derivatives Exchange, that is, trading futures and options. Finally, the Vancouver Stock Exchange and the Alberta Stock Exchange merged to form the Canadian Venture Exchange (CDNX) for trading small (junior) stocks. The equities portion of the Montreal Exchange subsequently merged with the CDNX and the Montreal Exchange became the sole market for derivatives.

In 2001, the TSE acquired the CDNX, which was renamed the TSE Venture Exchange in 2002. TSX Group was the combination of the TSX and the TSX Venture Exchange. In 2000, the TSE became a nonprofit company and in 2001 its acronym was changed to TSX.

In December 2007, approximately two years before the end of the specialization agreement, the TSX Group announced that it would acquire the Montreal Exchange. The Montreal Stock Exchange previously bought the majority of the Boston Options Exchange (Box). Thus, equity and derivative trading are unified in Canada. Consequently, unlike many other countries, Canada has a very concentrated market for trading stocks and derivatives.

**Mexican Stock Exchange**

The Mexican Stock Exchange, Bolsa Mexicana de Valores (BMV), is Mexico's only stock exchange and the second largest stock exchange in Latin America, behind the Sao Paulo Stock Exchange. In addition to stocks, it also trades mutual fund shares, warrants, and several types of debt instruments. It remains a private company, although it had planned an IPO in 2007 but delayed it.

**Sao Paulo Stock Exchange**

On May 8, 2008, Brazil's stock exchange, Bovespa Holdings SA (called Bovespa), and its futures exchange, Bolsa de Mercadorias e Futures SA (Brazilian Mercantile and Futures Exchange (BM&F)), merged, creating the new BM&F Bovespa. The exchange, also known as the Sao Paulo Stock Exchange, is the largest stock market in Latin America.