Tying action when the forward contract matures. The intervention in the monetary base, it would involve an offset – signed to generate an offsetting rise in the supply of foreign exchange would be balanced by actions de-
in the monetary base resulting from central bank sales intervention takes place in the spot market, the reduction toward foreign exchange market or both. When the in-
ward foreign exchange market does not involve an immediate reduc-
base money (such as through central bank purchases
and notes lies below the U.S. yield curve at maturities up
tion of monetary and financial policies and of regu-
and supervision by the government of the HKSAR.
Article 111 stipulates that the Hong Kong dollar will be the legal tender, backed by a 100 percent reserve fund. Ar-
ticle 112 states that no foreign exchange controls will be applied. Article 113 specifies that the government of the HKSAR will manage the Exchange Fund, primarily to maintain the value of the Hong Kong dollar.
Current market sentiment appears strongly to support the view that over the medium term the transfer of sovereignty will not have any adverse effects on the Hong Kong dollar. Indeed, swapped into U.S. dollars, the yield curve of Hong Kong Monetary Authority (HKMA) bills and notes lies below the U.S. yield curve at maturities up to seven years. This sentiment reflects the generally positive assessment of the Hong Kong financial system and of the professional financial management practiced by the HKMA.

The cornerstone of the financial system is the currency board linking the Hong Kong dollar to the U.S. dollar, which the HKMA has successfully defended in the past, most recently in January 1995 in the wake of the Mexican financial crisis. The first line of defense of the linked exchange rate is a large stock of reserves—US$64 billion at end-April 1997, or 40 percent of 1996 GDP. The second line of defense is the ability of the HKMA to raise short-term interest rates to make it expensive for speculators to obtain Hong Kong dollar credit. The banking system is highly capitalized and liquid, with very low levels of nonperforming loans, and it can tolerate increases in short-term interest rates that may be necessary to defend the exchange rate. Moreover, in 1996 the HKMA put in place other features of the financial system that increase its robustness, implementing a real-time gross settlement system in December and establishing a Mortgage Corporation, which will help to isolate property finance from fluctuations in short-term interest rates.

In addition, the People’s Bank of China, which has reiterated its support for the present exchange rate arrangements in Hong Kong, has stated that it would be prepared to use its own foreign exchange reserves to defend the Hong Kong dollar. The HKMA has also established a swap facility with the People’s Bank to provide liquidity to its reserves in the event of an attack on the exchange rate, as it has with 10 other monetary authorities in the region.

A number of recent empirical studies have attempted to determine under what conditions a speculative attack will take place and when spillover effects are likely to be present (see Annex VI of the Background Material). A common set of factors tend to affect the likelihood that a country’s currency will be attacked either directly or as a result of contagion. In particular, a country would most likely be attacked when it has a highly overvalued real exchange rate, a weak financial system (particularly when the problems arise following a very rapid expansion of credit), a weak fiscal position, an external debt position with a high proportion of short-term maturities, and limited international reserves.

Typically, the first line of defense has involved some form of sterilized intervention in the spot or forward foreign exchange market or both. When the intervention takes place in the spot market, the reduction in the monetary base resulting from central bank sales of foreign exchange would be balanced by actions designed to generate an offsetting rise in the supply of base money (such as through central bank purchases of government securities). While intervention in the forward market does not involve an immediate reduction in the monetary base, it would involve an offsetting action when the forward contract matures. The authorities’ ability to sustain a program of sterilized intervention is ultimately constrained by the quantity of the foreign exchange reserves and the resources they can obtain either from other official institutions or by borrowing on international markets.

Since a speculative attack requires that the speculator establish a net short position in the domestic currency, the authorities have employed a number of tactics to raise the cost of short positions (see Appendix 2 at the end of this chapter). When sterilized intervention has failed to stem the capital outflow, it has been necessary to allow short-term interest rates to rise, that is, to allow the monetary impact of the intervention to tighten conditions in financial markets and thereby make it more costly for the speculators to obtain a net short position by borrowing domestic currency. (Nonresidents borrow domestic currency in anticipation of a devaluation, as well as in order to deliver domestic currency when the forward contracts for sales of domestic currency against, say, dollars come due.) However, it is frequently found that such an increase in short-term money market rates is transmitted quickly to the rest of the economy and hence may be difficult to sustain for an extended period, especially if there are existing weaknesses in either the financial system or the nonfinancial sector.
Box 2. The Brady Bond Market Comes of Age

Since the first restructurings of Mexico’s defaulted sovereign loans into Brady bonds in 1990, the Brady market has grown to become the largest and most liquid emerging debt market. The investor base, composed originally of commercial and investment banks, gradually widened to include mutual funds, insurance companies, and other institutional investors. The number of distinct issuers and diverse characteristics of the different classes of Brady bonds—fixed- and floating-rate, collateralized and uncollateralized—and more recently the availability of derivatives, facilitated a rich set of sovereign and interest rate investment strategies. However, seven years after Mexico turned its defaulted sovereign loans into the first Bradys, some market participants are forecasting a rapid demise of the market. With the conclusion of a debt restructuring deal in March 1997 for Peru, the stock of outstanding dollar-denominated Brady bonds reached a peak of around $156 billion and has been declining following a series of buybacks and exchanges for uncollateralized global and Eurobonds. Côte d’Ivoire and Vietnam are expected to be the last significant entrants to the market, but their additions to the stock of Bradys is unlikely to offset the amounts recently retired by Brazil, Ecuador, Panama, and Poland.

As in previous Brady deals, Peru’s debt restructuring operation offered a menu of options to creditors, with the government repurchasing $2.6 billion of principal and past-due interest and issuing $4.8 billion of Brady bonds. Creditor preferences determined the issuance of $2.4 billion in past-due interest bonds (PDIs), $1.7 billion in front-loaded interest reduction bonds (FLIRBs), $560 million in discount bonds, and $182 million in par bonds. The PDI bonds and FLIRBs carry below-market interest rates for the first 10 years, paying LIBOR plus 1/4% percent thereafter, and have a graduated amortization schedule to maturity in 2017. The discount and the par bonds are collateralized and mature in 2027.

Improved conditions in emerging debt markets following the sustained rally since the Mexican crisis have led several countries to buy back and/or exchange their outstanding Brady bonds, mainly the collateralized instruments, at significantly lower spreads. Following the high-profile exchange in April 1996, Mexico used the proceeds of a 20-year global bond to retire $1.2 billion of discount bonds in September and called the remaining $1.1 billion of Aztec bonds in early 1997. In a deal that mimicked the Mexican swap, the Philippines exchanged one-third of its par bonds for a $690 million 20-year uncollateralized Eurobond in September 1996. The exchange freed up $183 million of collateral in U.S. treasury bonds. Ecuador, Panama, and Poland also followed this strategy and bought back some $250 million, $600 million, and $1.7 billion of Brady bonds, respectively. More recently, Brazil—the largest Brady country, with almost $50 billion in bonds outstanding—exchanged $2.7 billion of Brady bonds for a 30-year uncollateralized global bond.

entire stock of outstanding Brady bonds. As discussed below, the small size of emerging debt markets, and the potential ability of large trades to move the market, have contributed to inefficiencies and arbitrage opportunities between segments of the markets. In particular, persistent spread differentials between Brady bonds and Eurobonds with equivalent sovereign risk have raised questions as to whether these securities are priced appropriately and why these differentials have not been arbitrag ed. Since several countries have recently retired their Brady bonds, and others are expected to do so in the near future, this has raised further concerns about the size and liquidity of emerging debt markets as the stock of Brady bonds diminishes (see Box 2).

Market Segmentation: The Brady-Eurobond Differential

Figure 25 suggests that yields on Eurobonds have typically been lower than on Brady bonds. (Note the differences in scale for the Latin Brady bonds and Eurobonds.) The reported differential, however, reflects in part the fact that these bonds have different maturities, and the yields are not directly comparable. Moreover, many Brady bonds are partially collateralized by U.S. treasury discount bonds, while the more recently issued Eurobonds are not. The yield spreads reported on those Bradys that are collateralized are “stripped” yields, that is, yields after the value of the collateral has been subtracted from the value of the bond. Since the Bradys and Eurobonds have very different cash-flow patterns, rather than comparing yields and maturities, Figure 27 compares yields relative to duration. It is apparent that spreads on Brady bonds exceed those on Eurobonds, and the differentials can be substantial. On the date shown (April 11, 1997), for example, the Argentine floating-rate bond was some 175 basis points above the comparable Eurobond, while the par bond was some 285 basis points above. The yield differential between the Mexican par and discount Bradys and the Eurobond yield spreads was some 210 basis points.

Market participants have offered various explanations for the persistence of these yield differentials.

14In practice, different approaches (assumptions in the event of default) have been used to value the rolling interest guarantees, resulting in a range of stripped yield estimates.
15Duration is defined as the weighted average term to maturity of the cash flows from a bond, where the weights represent the present value of the cash flow relative to the price of the bond.
ing foreign investment in them. Traditionally, Latin America has had developed domestic markets, and sometimes by capital controls prevent been hindered in some emerging markets by the lack of well-devel -oped domestic markets, and sometimes by capital controls prevent ing foreign investment in them. Traditionally, Latin America has had better-developed and more accessible domestic bond markets than Asia.

Box 3. Repackaged Brady Bonds

“Repackaged” or “synthetic” Brady bonds are structured asset-backed securities in which the underlying asset is a portfolio of Brady bonds and the structure is provided by a credit derivative providing for a reduction, or suspension, of payment if a credit event involving the issuer of the Brady bond occurs (see Appendix 1, “Credit Derivatives,” to Annex III). These credit-linked notes are issued by an offshore trust or special purpose vehicle that holds the underlying Brady bonds, usually with a significant degree of overcollateralization. Most repackaged Brady bonds are sold to retail investors in Germany and are denominated in deutsche mark at fixed interest rates, so the issuer will, if necessary, swap the income from the Brady bonds into fixed-rate deutsche mark. Hence, the investor acquires a hedged exposure to emerging market credit that earns a significant premium over German government bonds.

The first public repackagings of Brady bonds in 1992 involved Venezuelan Debt Conversion Bonds, but the market for Brady repackagings really only developed in 1996—in 1993–94 there had been a large number of repackagings of Mexican tesobonos and some other non-Brady debt. Since 1992 there have been at least 76 public repackagings of emerging market debt with a total value of $6.6 billion. Repackaged Brady bonds have accounted for $2.1 billion—most of the remainder was composed of Brazil Multi-Year Deposit Facility Agreement bonds ($1.3 billion) and repackaged Mexican tesobonos ($1.1 billion). The most common sovereign risks identified in the repackagings were Brazil ($2 billion in repackaged bonds), Mexico ($1.2 billion), Venezuela ($737 million), and Argentina ($513 million). Other countries whose bonds have been repackaged include Ecuador, Mexico, Russia, and Turkey.

These bonds provide a means of arbitraging yield differentials between different investor bases—a comparatively high demand in Germany for deutsche mark-denominated emerging market credit—and between different classes of bonds (Eurobonds versus Bradys). However, if such transactions increase in popularity, credit-linked bonds may have a detrimental effect on liquidity in the markets for emerging market debt—since the Brady bonds are stored in trusts and replaced by relatively illiquid Eurobonds. Also, credit-linked bonds are issued by private firms but provide exposure to sovereign credit risk, and therefore compete for investor interest against new sovereign debt, possibly increasing the borrowing costs for emerging market issuers.

The proportion of dollar issuance by Asian entities on the other hand was some 10 percentage points higher in 1996 than it has been historically.

International issuance of emerging market debt has traditionally been in the major convertible currencies, requiring issuers to bear or manage the inherent exchange rate risk. While investment in domestic currency debt has represented a viable alternative to foreign investors in many emerging debt markets, this channel has been relatively limited. By avoiding domestic currency instruments and thus avoiding exchange rate risk, however, given the typically higher interest rates in emerging markets, they sacrificed yield. With investors searching for higher yields, and in another sign of the coming of age of emerging market debt as an international asset class, the last two years have seen the international issuance of debt—by entities from both the emerging and mature markets—in previously untapped emerging market currency sectors. Many of these markets were created by inaugural issues by supranationals (including the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank, the International Bank for Reconstruction and Development, and the International Finance Corporation), and some have grown rapidly to include sovereign, bank, and corporate borrowers. Since the development of these sectors, many supranationals have continued to find them attractive sources of funding, tapping them repeatedly as investors have traded higher yields for emerging market currency risk.

Among the Asian currencies, the New Taiwan dollar, the Philippine peso, and the Korean won sectors have been quite small, with issuance of under $1 billion each. In Eastern Europe, the Polish zloty and the Slovak koruna have also featured among the smaller markets. The Czech koruna market, on the other hand, has been very popular, growing quickly to reach $3.4 billion. The market has largely been tapped by supranationals through short-dated bonds at high yields with the supranationals accounting for about a third of issuance, and Austrian, German, and Dutch banks accounting for the remainder. The Argentine peso ($650 million) market generated considerable interest following the issue in January 1997 of a 10-year Arg$500 million bond that focused attention on relatively cheap peso debt and extended the local currency yield curve from 2 to 10 years. The most active emerging market currency sector has been the South African rand, growing from its inception in 1995 to $17.9 billion of issuance by end-May 1997 (see Box 4).

The favorable environment facing potential issuers in emerging debt markets caused a frenzy of first-time

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*19Foreign investment in domestic currency debt instruments has been hindered in some emerging markets by the lack of well-devel-oped domestic markets, and sometimes by capital controls prevent ing foreign investment in them. Traditionally, Latin America has had better-developed and more accessible domestic bond markets than Asia.*
Box 4. Emerging Market Currency Eurobonds: The Eurorand Market

Recently, offshore issuance and trading in South African rand-denominated debt have grown rapidly. Following its inception in September 1995, issuance activity in the Eurorand market remained relatively modest, with issuance of around $1 billion annually in 1995–96. During the first half of 1997, issuance surged to over $15 billion, while the yield curve was extended out to first 10 and then 30 years. The sector has been particularly popular with supranational issuers, who have accounted for about half of the issues. While a wide range of other entities have been active in the sector, including international banks and corporations, these have been almost exclusively from the mature markets. By May 1997, only two South African entities had tapped the sector. It is estimated that less than 10 percent of the funds raised in the sector have been for use in South Africa.

For investors, the attraction of Eurorand debt has been the combination of high yields and highly rated issuers. Investors have, therefore, been able to earn rand interest rates, but at lower perceived credit risks than if they invested directly in South Africa, where entities are bound by the sovereign ceiling. By permitting the separation of exchange rate and (sovereign) credit risk, Eurorand debt has been extremely popular with retail investors—particularly in Europe—willing to accept rand exchange rate risk but preferring the lower credit risk of an investment grade issuer, and with institutional investors bound by fund management rules to investment grade issues. The attraction for issuers to the Eurorand market has been the low cost of funding. By offering rand exposure without sovereign risk, triple-A-rated issuers have been able to price primary deals typically some 75 basis points below the South African gilts yield curve. The fact that investors have been willing to accept lower yields from the more highly rated issuers than is available on South African gilts has created a yield gap that has allowed issuers to swap the proceeds with, for example, a highly rated international investment bank or a South African counterparty, to obtain dollar funding rates of 35–40 basis points below LIBOR.

The fact that a majority of the funds raised have not been intended for use in South Africa raises the question of what effect the Eurorand market has on capital flows to South Africa and on the value of the rand. In the first instance, when the rand required for purchase of a Eurorand issue is obtained on the domestic spot market by surrendering dollars, there is a capital inflow into South Africa. There are then a variety of possibilities, and the net effect could be neutral or positive for capital flows and foreign exchange markets. First, the issuer could exchange the rand raised for dollars on the domestic spot market, implying a capital outflow that offsets the original inflow, and the net effect is zero. Second, the issuer could invest the proceeds in South Africa. In this case there is a net capital inflow equal to the value of the issue. Third, after exchanging the proceeds into dollars, the issuer could enter into a swap to buy rand forward from a domestic South African counterparty, and this would reduce pressure on the forward rand exchange rate. If the issuer enters into a swap with an international investment bank, the investment bank in turn could hedge its risk by, for example, making a leveraged purchase of gilts. In this case, there would be some net inflow, but less than the value of issue.

ratings by the major international credit-rating agencies. During 1996, 16 sovereigns, primarily from Eastern Europe and the Middle East (7 from each), were assigned ratings by at least one of the two major international credit-rating agencies. By comparison, only five new sovereigns were assigned ratings in 1995. By May 1997, an additional five countries had received ratings. The number of countries with sovereign ratings from at least one of the major ratings agencies has grown rapidly from 11 in 1989 to 58 in 1996. In addition to the increase in the number of sovereigns rated, there has been a rapid increase in the number of nonsovereign entities in emerging markets that have been rated. This latest round of ratings has more or less completed the waves of regional ratings through the major emerging market regions, again with the exception of Africa.20 The fact that a majority of the new ratings have been in the investment grade category, coupled with upgrades of existing ratings over the last few years, has resulted in a steadily increasing proportion of investment grade emerging market sovereigns. Compared with 44 percent in 1993, the proportion had risen to 55 percent by May 1997 (based on Moody’s ratings). Systematic regional differences among the emerging markets persist, however, as a majority of the Asian emerging markets are rated investment grade, while in Latin America, though ratings have been improving, the majority are still rated below investment grade. The European emerging markets are somewhat evenly split.

Spread Compression in Emerging Debt Markets

Numerous market participants and observers have argued that the low level of interest rates in the mature markets caused investors to substitute risk for increased returns, and that the resulting increase in demand pushed down spreads on riskier securities. This is evidenced, it is argued, not only by the decline in

20 Many of the Asian economies were assigned ratings in the late 1980s, followed by Latin America in the early 1990s, and now the Middle East and Europe.
by the rise of the market during 1996, and a market fall back would presumably not induce a sharp fall in final demand. Moreover, the strength of the economy and financial institutions along with an improved securities market infrastructure all suggest the consequences of a significant correction could be managed without having major consequences for the health of the economy. Such expectations are consistent with the experience after the 1987 crash (see Box 6 on Circuit Breakers).

**Derivative Markets**

**Recent Developments**

Growth of the global derivative markets during the past decade has been phenomenal both in the exchange-traded sector and in the over-the-counter markets (Statistical Appendix Tables A5–A7; see also Tables 9–10). During the period 1986–96, the annual trading volume of exchange-traded contracts—including interest rate futures and options, currency futures and options, and stock market index futures and options—nearly quadrupled, reaching 1.16 billion contracts at end-1996. The growth of these markets has been even larger when measured by outstanding notional principal: the average annual growth rate of outstanding notional principal of exchange-traded contracts has been 32 percent over the past decade and stood at $9.9 trillion at end-1996. The growth and the size of the over-the-counter markets is even more impressive: the notional principal of outstanding currency and interest rate swaps and interest rate options reported by members of the International Swaps and Derivatives Association (ISDA) rose from $0.9 trillion in 1987 to $24.2 trillion in 1996, representing an annual average growth rate of 45 percent.

More comprehensive surveys of the current size of global derivative markets paint an even more striking
...dental. In comparison, the 300th largest asset manager at the end of 1995 controlled $2.7 billion in assets, just slightly more than the $2.4 billion (in 1995 dollars) managed by the 300th-largest asset manager in 1985. This points clearly to a consolidation of assets, with the largest asset managers growing much more rapidly than the smaller asset managers. Although Fidelity’s growth in total assets under management slowed in 1996—it received just 10 percent of net equity mutual fund inflows versus 20 percent in 1995—it is a very large player, with some estimates attributing 12–15 percent of turnover in U.S. equities to Fidelity alone. In Europe, too, consolidation in the fund management industry has taken hold in recent years. In late 1996, two French insurance groups, AXA and UAP, announced plans to merge to create one of the world’s largest asset managers, with combined assets of $420 billion (end-1995 figures), rivaling Fidelity of the United States.

So, while it is clear that consolidation is having profound effects on the size of the larger asset managers, can one conclude that investment assets are concentrating in the hands of just a small number of mammoth asset managers? The evidence does suggest that consolidation is working in this direction, but the pace is not as fast as might be imagined, particularly in the United States. In 1985, the top 10 asset managers accounted for 23 percent of the assets of the largest 300 asset managers, and this share was the same five years later. By end-1995, however, this figure had increased modestly, to 27 percent. Moreover, the top 100 asset managers increased their share of the assets managed by the top 300 asset managers by 9 percentage points over 1985–95, accounting for 83 percent of assets at end-1995. Similarly, in Europe, the top 10 asset managers increased their share of assets managed by the top 100 asset managers by 7 percentage points over the period 1991–95, from 31 to 38 percent of the assets of the largest 100. Consolidation activity, therefore, seems to have increased the relative size of the largest asset managers much more in Europe than in the United States. In the United States, consolidation activity has been more broadly based, increasing the relative size of the largest hundred or so asset managers. However, it is noteworthy that classification of asset managers geographically is becoming increasingly meaningless—as mentioned above, recently some large European asset managers have consolidated global asset management activities in the United States. Moreover, consolidation activity has increasingly been across borders, reflecting a tendency toward the evolution of global asset managers.

In light of the forces affecting the fund management industry in recent years and the response of the industry to those forces, it is widely held that the outlook for the industry contains considerably more consolidation in the industry as well as geographically. An oft-painted scenario for the industry early in the next century is one in which there are a relatively small number of very large global companies each managing assets well in excess of $150 billion and a number of smaller management companies surviving in regional niche markets.

In April 1995, the Bank for International Settlements (BIS) coordinated the first survey by central banks in 26 countries of OTC and exchange-traded derivative markets in these countries, providing the most comprehensive survey to date and believed to capture about 90 percent of the intermediaries active in the derivative markets. The survey included swaps, forwards, and options for foreign exchange, interest rates, equities, and commodities, whereas the ISDA survey was limited to interest rate and foreign exchange swaps and options. Moreover, the BIS survey included many derivatives positions that were not recorded in the ISDA survey, not only because the BIS survey captured more market participants, but also because it reported many arm’s-length derivatives contracts that are netted out in the ISDA survey.
most likely to be successful in OTC markets. Most important, the market for credit risk derivative contracts—in which banks in particular could trade loan credit risk—is inherently a highly heterogeneous product market (see Appendix I to Annex III), which exchanges are not conducive to handling efficiently. Finally, the OTC derivative markets have an important regulatory advantage over the exchange-traded markets. Specifically, whereas the Commodity Exchange Act of 1974 gives the Commodity Futures Trading Commission regulatory authority over the derivative exchanges, the so-called Treasury Amendment effectively exempted from CFTC oversight certain financial futures traded off of U.S. exchanges. There has been a great deal of uncertainty about the extent of the amendment’s reach, which has in turn prompted numerous lawsuits and legal uncertainty. Legislation introduced in early 1997 would, among other things, limit the CFTC’s oversight of OTC markets only with respect to foreign currency products and would also permit the exchanges to establish separate, unregulated markets that are restricted to institutional investors. If passed into law, this latter feature would reduce the competitive advantage of the OTC markets, but the significance of this effect is unclear.

21If the proposed legislation is passed into law it would reverse the February 25, 1997, Supreme Court ruling that off-exchange trading in foreign currency options is exempt from CFTC regulation.
that market participants learn something during a trading halt that helps them determine the instrument’s price: both fundamental information and order flow information are important. Depending on the trading mechanism, either indicative quotes or postings of bids and offers and the amounts underlying them should be given at intervals during the halt to provide information about order imbalances. If open outcry is used, market participants should freely announce their willingness to buy or sell at various prices.

In addition, there needs to be an established and well-known method for resuming trade. A single call auction, whereby a specialist gathers the bids and offers over a set period of time and establishes a market-clearing price at which all the existing orders receive the same execution price, is thought to be one of the most equitable. It helps to relieve an element found in most panics—the desire to get an order executed before the price falls farther.

In addition to the immediate microstructure issues surrounding the trading environment, there are also infrastructure issues that may require attention. When clearing and settlement procedures are not well established or take extended periods of time to operate, uncertainty regarding the solvency of the participants can arise, limiting liquidity and participation when it is most needed and, in some instances, inhibiting the use of the exchange entirely as a venue for trading.

As an alternative to circuit breakers, share repurchases by corporate issuers may help stem a dramatic price decline in equity markets. At some point, a firm may deem the price of its stock low enough to buy it back and reissue it at a later date for a profit, thereby obtaining additional equity from the market. Share repurchases signal to the market that the firm, with inside knowledge of its value, believes that the shares are undervalued. Similarly, purchases from a major participant in the market can show confidence and help inhibit further sales. To allow these mechanisms to operate, a country may need to relax or eliminate restrictions regarding corporate repurchases.

Other institutional features that may reduce the incidence of a crisis include (1) restrictions on bank lending for stock purchases by requiring various amounts of collateral; 2 (2) better audit trails to detect market-trading abuses, such as price manipulation that may start a panic; and (3) education of market participants, especially small retail investors, to enable them to understand the practices and procedures surrounding trading during normal times as well as the different procedures that may occur during stressful periods.

While certain types of circuit breakers may achieve some goals, they are all impediments to a freely functioning market—preventing buyers and sellers from executing trades at mutually agreed prices—and have some deleterious effects. Circuit breakers may limit trading by participants that are attracted only by large price moves, and hence eliminate a stabilizing factor. In most instances, the existence of circuit breakers is likely to alter participants’ behavior around their imposition. For instance, a “magnet effect” may occur when participants recognize that as the price approaches a price limit they will be unable to execute their desired trades and so they execute early. Alternatively, an opposite “repelling effect” may occur when participants prevent the limit from being hit because they know their ability to trade will be impaired. While these behavioral trading effects are certainly present, the most basic criticism of circuit breakers is that when fundamental information implies a large price movement, circuit breakers merely lengthen the time involved in obtaining the new price level.

The increasingly central role of the OTC markets is reflected also by the approach that market participants took in establishing convergence positions in 1996 in Europe. As noted previously, these convergence positions were heavily concentrated in the swaps market, which pushed deutsche mark–denominated swaps activity up 44 percent in the first half of 1996. Earlier in 1996 these positions entailed paying deutsche mark and receiving a higher-yielding currency. Perhaps the most notable positioning in the context of EMU occurred later in 1996 and focused on the French franc versus the deutsche mark yield spread. Earlier in 1996, convergence positions in this market were mounted on the belief that this yield spread would narrow. However, the French forward curve actually traded below deutsche mark’s later in the year, which in turn caused very large deconvergence position taking—estimates and commentary from market participants suggest that the magnitude of these deconvergence trades made them some of the largest speculative positions ever mounted in international capital markets, with some estimates putting positions amassed by U.S. investors alone in excess of $50 billion at end-1996.

Developments in Systemic Risk Management

As financial markets become more integrated and increases in technology and telecommunications per-
Box 7. ERM2

The Treaty of Maastricht does not specify the exchange rate arrangement between EMU and the EU countries that are not initial members. To eliminate this uncertainty, in December 1995, the European Council in Madrid announced that the current ERM will be replaced by a new exchange rate mechanism, called ERM2, whose main features were agreed on in the Resolution of the Amsterdam European Council in June 1997.

The main objective of ERM2 will be to support the single market by avoiding the disruption of trade flows resulting from real exchange rate misalignments or excessive nominal exchange rate volatility. Participation will be voluntary but expected, especially by countries planning to join EMU with a delay. To allow for different degrees and strategies of convergence, the structure of ERM2 will be flexible. Target fluctuation bands vis-à-vis the euro will be wide: plus or minus 15 percent. Narrower bands between the ECB and non-EMU national central banks are foreseen, but they will be “without prejudice to the interpretation of the exchange-rate criterion” of the Maastricht Treaty. Also, bilateral fluctuation bands and intervention arrangements between two non-EMU national central banks will be possible. Intervention at the margin should be automatic and unlimited, but the ECB and the EMU national central banks will be entitled to suspend intervention if the primary objective of price stability is threatened. Intramarginal intervention will remain discretionary. The Very Short Term Financing Facility (VSTF) of the current ERM will be available also in ERM2 “broadly on the basis of the present arrangements.”

The main uncertainty about the functioning of ERM2 regards the commitment of the ECB to support a currency of the system under attack. This commitment seems to be limited by the provision that intervention could be suspended “if this were to conflict with the primary objective of price stability.” Threats to price stability, however, are likely to be much rarer than in the present ERM because the large scale of EMU will allow easier sterilization of any ERM2-related intervention; in addition, the latter will have a much more limited impact on the liquidity of the euro area. At the same time, intervention by a non-EMU national central bank will not be very effective in stabilizing its parity with the much larger euro zone. Thus, non-EMU countries can reasonably be expected to exercise their obligation for stabilizing ERM2 parities primarily through the maintenance of appropriate monetary, fiscal, and structural policies, rather than through foreign exchange market intervention.

The two-week maturity and the weekly frequency selected for the ECB’s operations are identical to those of the reverse transactions in Germany. The maturity of reverse transactions is shorter in most other countries. There is a clear-cut distinction between the higher frequencies of intervention (up to three times a day in the United Kingdom) in the United States, the United Kingdom, Canada, Australia, and Japan, and the lower (generally weekly) frequencies in all other countries, especially those that are likely to be inaugural members of EMU. Additional irregular fine-tuning operations are used in every country with the exceptions of Germany and Austria. Also fairly common are long-term refinancing operations, though these are not used in Canada, Australia, Spain, and Sweden.

Most countries also have marginal lending and marginal deposit facilities. Where a formal standing facility does not exist, similar arrangements are in place. In the United Kingdom, there are several facilities charging escalating rates aimed at limiting the rise in the overnight rate. In Canada, discretionary reverse transactions operate as quasi-standings facilities. In Germany, issuance of short-term paper plays the role of a deposit facility. Although some countries still maintain a subsidized below-market facility (discount window), it has generally not been used in recent years for liquidity management purposes.

Average reserve requirements exist in Australia, Austria, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, and the United States, but they are remunerated only in Australia, Italy, the Netherlands, and Switzerland. To reduce the volatility of the overnight rates, some countries without reserve requirements have introduced averaging provisions. In Canada, for example, there is a “zero” reserve requirement with averaging and banks are penalized when they have negative average settlement balances on a one-month period. In the United Kingdom, reserve requirements have been replaced by a small cash deposit ratio, but without averaging.

Although frequent interventions have not been ruled out, the announced framework for the ECB’s monetary policy appears much closer to the continental European model than to that of one of the other industrial countries. Key decisions remain, however, and events could force the ECB to play a more active role.

Framework for General Financial Policies

Banking Supervision and Functions of Lender of Last Resort

Among the industrial countries, there is no clear tendency to combine banking supervision functions with monetary policy functions (Table 42). About half of the countries combine the two functions within the central bank. The other countries separate these func-
The relation between exchange rate stability and the volatility of asset prices has been one of the most debated issues in the economic literature. One view is that a fixed exchange rate regime—hence EMU—increases the volatility of securities prices. According to this view, when the exchange rate is not allowed to change, shocks to productivity, consumer preferences, or other real shocks of domestic origin will be reflected to a larger extent in securities prices (“volatility transfer hypothesis”).

Several arguments have been put forward to counter or qualify this view. First, the volatility transfer hypothesis holds unambiguously only when real domestic shocks prevail; if domestic or foreign money demand shocks prevail, a fixed exchange rate regime would have, instead, an opposite, dampening, effect on the volatility of securities prices. Furthermore, for foreign real shocks, the consequences of fixing the exchange rate become ambiguous. Second, if the volatility of the exchange rate is created by uninformed “noise traders” or “chartists” responding to nonfundamental factors, then credibly fixing the exchange rate would eliminate the excess volatility without transferring it to other sectors of the economy. Finally, if the fixed exchange rate regime is imperfectly credible and stochastic shocks may trigger a speculative attack, then the volatility of interest rates is higher than it would be with a perfectly credible parity or a single currency, as in EMU; in this case, the impact of a fixed-rate regime on the volatility of interest rates provides no indication of what would happen with a perfectly credible fixed exchange rate regime or EMU.

The question can only be settled empirically. A recent study by Flood and Rose (1995) of various episodes of fixed and flexible exchange rates over the 1960–91 period for OECD countries concludes that there is little evidence that “reducing exchange rate volatility compromises the stability of other macroeconomic variables” (p. 36). Similar results are obtained for EMS countries by Artis and Taylor (1994) and Fratianni and von Hagen (1990). Following a methodology similar to Mussa (1988), Bodart and Reding (1996) compare the volatility of bond and equity market returns across different exchange rate regimes. They use high-frequency data (daily returns between January 1989 and December 1994) for Belgium, France, Germany, Italy, Sweden, the United Kingdom, and the United States. They find that the countries with the lowest foreign exchange volatility (Germany, France, and Belgium) have the lowest volatility of bond returns also. In these countries, the volatility of equity prices is also lower than in Sweden and Italy. Furthermore, after breaking up the sample into subperiods, they find that, as long as the EMS regime was credible, the low volatility in foreign exchange markets was associated with a low volatility in bond markets. When foreign exchange volatility increased, bond market volatility did also. Analogous—although weaker—results were obtained for equity prices. Frankel (1996) conducts a similar experiment on stock prices and reaches similar conclusions. This evidence suggests that lower—not higher—volatility of securities prices is associated with lower exchange rate variability.

There are two main reasons why securities prices could be correlated across countries: a common fundamental factor or contagion effects. In both instances, the correlation is likely to be affected by EMU. First, if EU securities prices share a common fundamental, EMU can increase their correlation because it reduces the variance of idiosyncratic shocks due to independent monetary policies. EMU might also reduce the correlation of securities prices by increasing the variance of the credit risk component. In the government bond market, this may happen because EMU eliminates the possibility of using the inflation tax to resolve country-specific budgetary difficulties. Similarly, in the corporate bond market, EMU eliminates the possibility of using the exchange rate instrument to compensate for real idiosyncratic shocks. In stock markets, EMU is expected to have a lower impact on price correlations because of the much higher potential for idiosyncratic shocks. A higher cross-country correlation of equity prices should, however, also be expected because EMU eliminates idiosyncratic monetary policy shocks and is likely to increase the correlation of business cycles.

Second, international correlations of securities prices can also be explained by contagion effects due to noise trading or herd behavior unrelated to fundamentals. In this case, cross-country correlations should be higher in periods of high market volatility, when there is a large dispersion of expectations about fundamentals. As long as fixing exchange rates or introducing a single currency reduces the uncertainty about monetary policy, periods of high market volatility should become less frequent and contagion and correlation of securities prices should fall. Thus, if international correlations of securities prices stemmed mainly from contagion effects, EMU would not increase the correlation—as suggested by the fundamental approach—but reduce it.

Two studies on the effects of exchange rate regimes on the cross-country correlation of securities prices suggest that a smaller exchange rate volatility, and thus EMU, should increase cross-country correlations. Bodart and Reding (1996) find that correlations of both bond and equity prices were stronger for the countries with the lowest exchange rate volatility. Moreover, correlations weakened in the turbulent period of the ERM. Interestingly, the correlation between German and U.K. bond markets was higher during the short period in which the British pound was part of the ERM. Frankel (1996) conducts a similar experiment on Irish stock market data and obtains similar results. The existing empirical evidence suggests that the exchange rate regime matters and that exchange rate stability tends to increase cross-country correlations of securities prices. EMU may then be expected to have a similar effect. These results should, however, be interpreted with caution because they do not rule out the possibility that changes in the volatility of idiosyncratic fiscal and political shocks—affecting simultaneously foreign exchange markets and securities markets—could account for the observed changes in correlations.
Box 9. Liberalization of Capital Controls in Emerging Markets

The figure plots an index of capital controls in emerging markets. This index is based on information on 163 countries obtained from the IMF’s annual survey of Exchange Arrangements and Exchange Restrictions and constructed using the methodology of Bartolini and Drazen (1997). Three dummy variables for each country for each year were constructed corresponding to whether a country restricted capital account transactions, used multiple exchange rate practices, or enforced surrender requirements for export proceeds. An index for each country for each year is obtained by summing its dummy variables and dividing by three. It varies between zero and one, with zero representing a complete lack of controls and one the existence of all the restrictions mentioned above. The aggregate capital control index shown is the mean of the country indices for each year.

The loosening of capital controls in emerging markets since the mid-1980s is clearly brought out by the index. The figure also suggests that the decline in capital account restrictions may have contributed to the recent boom in capital flows to emerging markets. The correlation between the index and capital inflows is \(-0.3\) over the period shown and provides some simple corroboration for the claim that liberalization of external transactions has been instrumental in attracting foreign capital.

\[ \text{Capital controls index} \]
\[ \text{Capital flows/GDP} \]

Sources: International Monetary Fund, Annual Report on Exchange Arrangements and Exchange Restrictions; and World Economic Outlook.

An index of integration developed by the World Bank shows that while many more emerging markets are now better integrated into the international financial system, the process is at an early stage. Recent empirical studies provide a similar picture: there is a growing degree of de facto integration of domestic and international financial markets, in the sense that it is becoming increasingly difficult to keep domestic financial market conditions isolated from developments in international markets. The growing importance of portfolio flows (both bond and equity) in the 1990s has reflected two other fundamental structural changes in international financial markets, namely, the growing role of institutional investors and securitization. Institutional investors, including mutual funds, insurance companies, pension funds, and, more recently, hedge funds, have become increasingly important purchasers of emerging market securities. To an important degree, their participation in such markets has been driven by the desire both to increase the overall return on their portfolios and to diversify the risks associated with these portfolios. Although these institutional investors typically allocate only a relatively small proportion of their total portfolios to emerging market assets, their sheer size has contributed to the rising tide of capital flowing to emerging markets.

Securitization has involved a greater use of direct debt and equity markets—in which the lender or investor holds a tradable direct claim on the borrower or firm—and a shift away from indirect finance—in which an intermediary holds a nontraded loan asset and the saver holds a liability (which may be tradable) on the intermediary. Another form of securitization has involved the creation of exchange-traded futures and options contracts. In this case, a certain type of risk, usually one associated with price volatility, is securitized. While the substitution of direct for indirect instruments has been driven in part by the lower relative cost of borrowing on securities markets by the more creditworthy borrowers (who often have a higher credit rating than banks), the growing importance of both exchange-traded and over-the-counter (OTC) derivative products has been strongly affected by the desire of portfolio managers (particularly from large institutional investors) to either hedge or increase their exposure to certain types of asset-price risks.

A final “structural” factor that has been especially important for the pricing of derivative products has...