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4. Derivatives markets

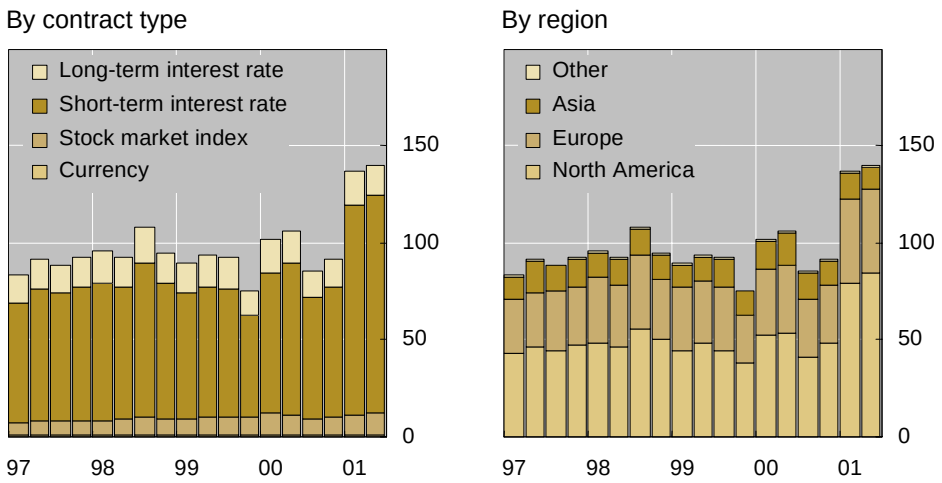
Aggregate turnover on exchange-traded derivatives markets reached a new high in the second quarter of 2001, with the dollar notional value of contracts monitored by the BIS rising by 3%, to $139.7 trillion. Although the markets' rate of expansion moderated sharply relative to the record increase seen in the previous quarter, business in fixed income instruments, particularly on US money market rates, remained exceptionally buoyant. While monetary policy easing appears to have been an important element in the high turnover of interest rate instruments, changes in risk management practices may have also played a role. In Japan, by contrast, turnover in most fixed income products remained on a downward trend.

US policy rate cuts continue to support money market business

The pace of activity in interest rate contracts moderated significantly in the second quarter of 2001. Turnover expanded by only 2%, to $127.4 trillion,

Turnover of exchange-traded futures and options

Quarterly data, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.1

compared with an increase of 55% in the previous quarter. Business in money market instruments rose by 4%, to $111.3 trillion, while that in government bond contracts declined by 8%, to $16 trillion.

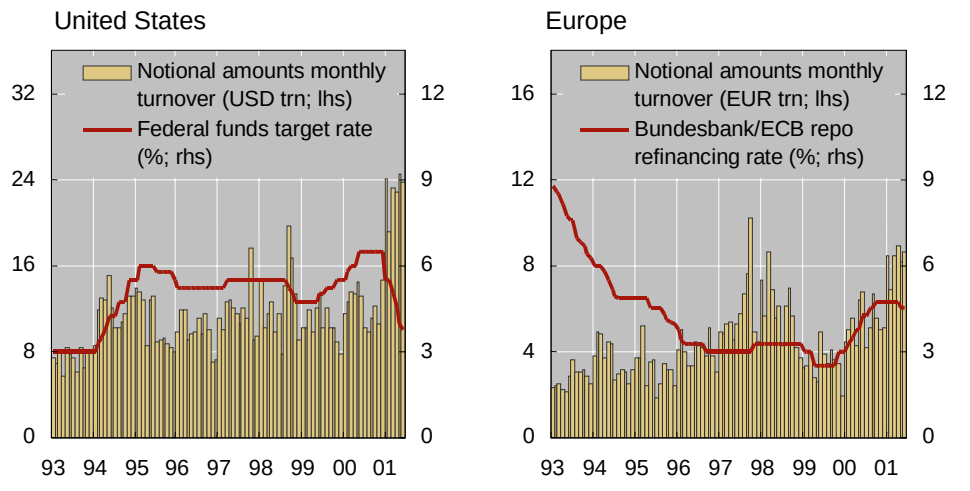
Buoyancy of short-rate US business seems related to US easing …

As in the first quarter, one of the key features of the second quarter was the exceptional buoyancy of turnover in US money market contracts. The ongoing strength of business in that market segment seems to have been related to attempts to hedge or take positions ahead of further US monetary easing. In particular, the 50 basis point inter-meeting cut in the federal funds target rate in mid-April, the second such reduction since January 2001, apparently once again caught market participants by surprise, creating uncertainty about the timing of additional easing moves. In the euro zone, expectations about the course of short-term rates were somewhat more stable than in the United States, but the ECB's decision to lower its policy rate by 25 basis points in May appears to have been unexpected. By contrast, short-term activity in Japan remained on a downward trend as the de facto return to a policy of zero interest rates since March, and a widespread market perception that monetary policy would continue to be accommodating, weakened the incentive to trade. This slowdown was in line with the lower volume of activity reported in Japan's underlying money market.

… and to a broader switch to Libor-based hedging

The sharp increase in the turnover of US money market contracts since the beginning of the year may also have reflected other underlying factors. For one thing, the first two quarters witnessed high levels of gross issuance of dollar-denominated corporate and agency debt (see Sections 1 and 3). This generated activity in the interest rate swap market and, in turn, in eurodollar futures since such instruments are commonly used in the hedging of swaps.

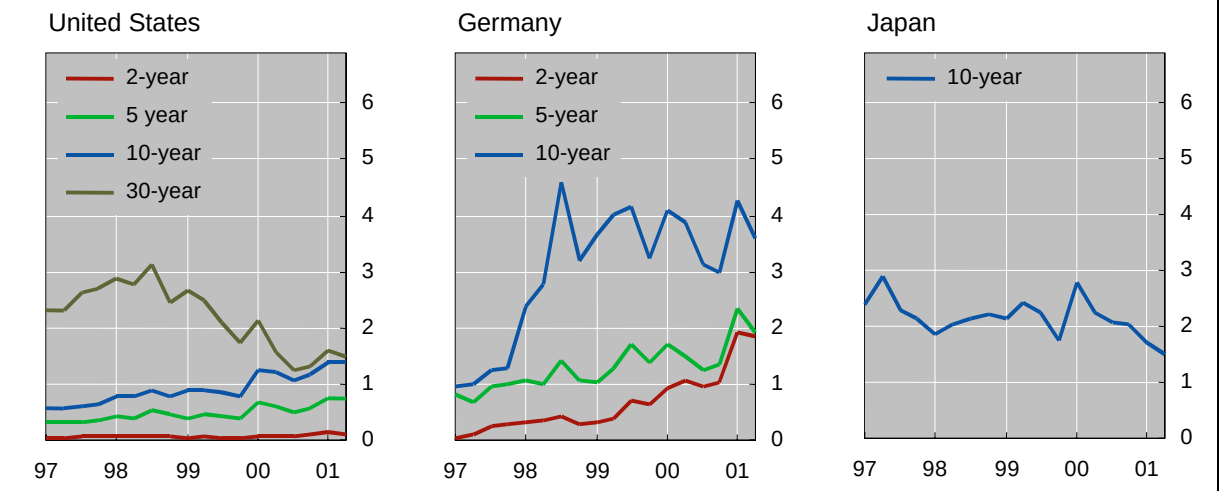
Short-term interest rate contracts and central bank target rates



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.2

Turnover in government bond contracts

Quarterly futures contract turnover, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.3

Activity may also have benefited from a broader movement of hedgers and traders away from the US Treasury yield curve and towards the Libor-based swap curve. Indeed, higher turnover in eurodollar futures and options was accompanied by an even more rapid expansion of shorter-maturity contracts (one-month Libor and one-month federal funds) in the first half of 2001. Although such contracts accounted for a small share of total turnover in US money market instruments (with about 10% of second quarter turnover), they may experience further expansion in coming periods as the US Treasury moves to the issuance of shorter-term liabilities.[1]

A drop in turnover of bond contracts

Meanwhile, a decline in activity in longer-term instruments contrasted with the buoyancy of money market business. Much of the drop resulted from a 13% contraction of turnover on Eurex, particularly in five-year and 10-year government bond contracts. This contraction represented a return to a more normal trading pattern, following the 50% increase in Eurex's fixed income contracts in the previous quarter. Matif (Euronext Paris) saw an even more pronounced decline in activity in its key bond contract. Market commentators attributed the 28% drop to the winding-down of a market support operation for the Euro Notional established by French banks in late 1999.[2] In the United States, activity in bond contracts proceeded at a steady pace as medium- and long-term US interest rates moved within a fairly narrow range. Since this subdued volume of business was somewhat at odds with that observed in the

[1] In May, the US Treasury announced that it would begin issuing four-week maturity Treasury bills to provide it with greater flexibility and efficiency in managing its cash balances.

[2] It should be noted that the drop seen on Matif occurred in spite of the reintroduction in mid-May of a five-year Euro Notional contract aimed at exploiting a window of opportunity created by the recent squeeze on Eurex's five-year German government bond contract (see the previous issue of the *BIS Quarterly Review*).

cash market for Treasury securities, where turnover has expanded sharply since the beginning of the year,[3] it may confirm anecdotal evidence that risk management is shifting away from the Treasury yield curve. In Japan, activity continued on a downward trend, with a 9% decline in the turnover of Japanese government bond contracts. Although long-term interest rates rebounded slightly in the early part of the quarter, the weakness of overall economic conditions probably led market participants to believe that long-term interest rates would not alter significantly.

Subdued activity consistent with shift to Libor-based instruments

Growing market acceptance of new futures contracts on swap rates and single equities

Market seems receptive to LIFFE's Swapnote contracts

One of the most notable developments in the second quarter of 2001 was the positive reception given to LIFFE's Swapnote futures. The contracts, which were introduced at the end of March 2001, are indexed on two-year, five-year and 10-year euro-denominated swap rates. Although business in Swapnote contracts accounted for only a marginal share of second quarter trading in fixed income instruments on LIFFE ($99 billion or 0.4% of such trading), activity progressed gradually during the course of the quarter, helped by a temporary elimination of transaction fees.

Recent developments create a niche for swap-based futures

Recent developments in European fixed income markets may have created a niche for swap-based futures. In particular, the introduction of European monetary union in January 1999 has led to a decline in the importance of European government bond markets as pricing benchmarks for fixed income securities. In spite of the high credit quality of European government bond markets, they remain heterogeneous, a situation that has been exacerbated by supply/demand imbalances resulting from declining government issuance in some countries. As a result, the swap curve has in effect become a homogeneous benchmark for European fixed income markets.[4] This could help ensure market acceptance of swap-related contracts.

Recent squeezes on Eurex could encourage trading in Swapnotes

Moreover, Swapnote contracts could benefit from the recent squeezes that have affected trading in government bond contracts on Eurex (see the previous issue of the *BIS Quarterly Review*). They should be less prone to squeezes owing to their cash-settled nature and to the large size of the euro-denominated swap market relative to the stock of government securities underlying government bond futures ($16.6 trillion in notional terms, versus roughly $3.3 trillion at the end of 2000). Swap-based contracts could also receive an additional boost from the decision of some European national debt

[3] On the back of Federal Reserve easing, a steepening of the Treasury yield curve and record issuance of US dollar-denominated fixed income securities.

[4] The impact of the introduction of the euro on European bond markets is discussed by Kostas Tsatsaronis and Gabriele Galati in "The impact of the euro on Europe's financial markets", *BIS Working Papers*, no 100, July 2001.

management offices to use interest rate swaps in the management of public debt.[5]

Introduction of swap-related contracts forms part of a broader "tipping" process

The growing trading and pricing role played by interest rate swaps in US financial markets, particularly in a context of long-term debt repayment by the US Treasury, could also provide fertile ground for the introduction of similar contracts in the United States. Indeed, the Chicago Board of Trade recently announced that it would launch futures and options contracts on five-year and 10-year dollar swap rates in the autumn of 2001. It should be noted that the introduction of swap-related contracts probably forms part of a broader "tipping" process in which market participants find it advantageous to shift away from reliance on government securities for hedging and positioning to private sector benchmarks.[6]

Swap futures could attract new participants

One of the difficulties faced by exchanges in developing swap-based contracts is that the swap market has traditionally been dominated by a narrow group of highly rated banks (generally AA/Aa). These banks have been able to maintain a central role in interest rate and credit intermediation by providing liquidity in plain-vanilla contracts, while at the same time offering a wide range of custom-made instruments. The development of liquid swap futures, achieved by the attraction of significant trading volumes through standardisation, price transparency and the interposition of a clearing house as central counterparty, could enable second-tier or lower-rated financial intermediaries to enter the swap market. Such an entry of new participants appears to have occurred with Swapnote contracts as regional European banks were reported to have represented an important source of trading demand. Although successful entry by lower-standing counterparties could have implications for the profit margins of existing market participants, it could also provide additional liquidity to the broader swap market, highlighting the growing complementarity of exchange-traded and over-the-counter markets.

Further expansion of trading in LIFFE's single stock futures

Another notable development in the second quarter was a further expansion of trading in single stock futures introduced by LIFFE in January 2001 (see "Recent developments in exchange-traded equity derivatives" on page 34). The number of listings increased from 25 companies to 65, with turnover rising to 611,000 contracts, or 30% of the volume of options on single equities. Encouraged by the development of single stock futures on LIFFE, the three largest US exchanges announced in May the creation of a joint venture for the electronic trading of single stock futures when such contracts receive final regulatory approval.

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[5] France and Germany recently announced that they would join Italy in using interest rate swaps for debt management purposes.

[6] The issue of benchmark tipping is developed in a special feature by Robert N McCauley, "Benchmark tipping in the money and bond markets", in the March 2001 issue of the *BIS Quarterly Review*, pp 39-45.

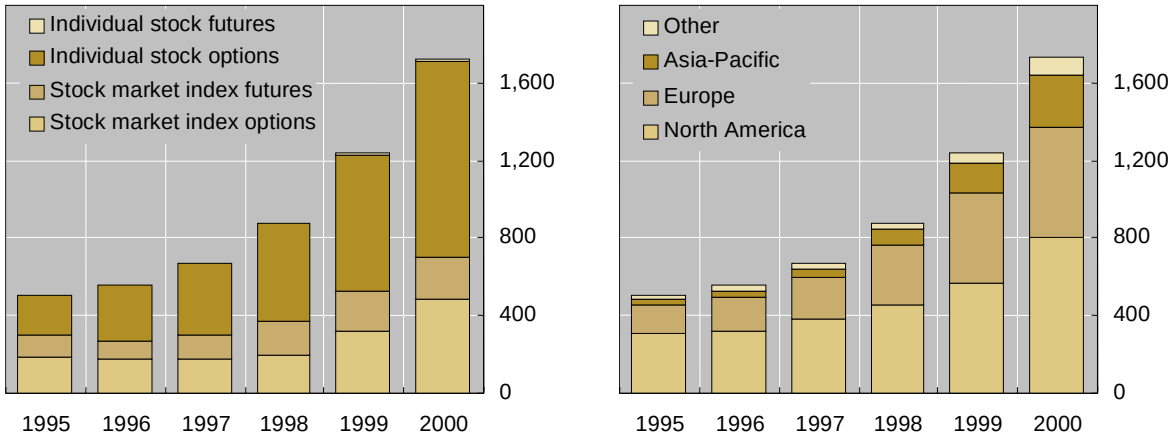
Recent developments in exchange-traded equity derivatives

The equity bull market of the second half of the 1990s was accompanied by a rapid expansion of exchange-traded equity derivatives.[1] While much of that expansion was concentrated in a narrow group of contracts, the introduction of new types of instruments also helped boost activity. This box looks at the recent evolution of the different groups of equity-related instruments and describes some of the major innovations introduced by exchanges.

The graph below shows that growth in exchange-traded equity derivatives largely took place in options on single equities, particularly in North America and Europe. Such options have been actively traded in North America for almost three decades but have only recently become popular in Europe.[2] By contrast, global trading in stock index contracts has increased at a less rapid pace, with growth largely taking place in Asia and Europe. The volume of stock index transactions conducted on North American exchanges has barely increased, in spite of the introduction of many new contracts and the boost to turnover resulting from a reduction in the size of large contracts (which mechanically increases transactions).

Total turnover of exchange-traded equity contracts

In thousands of contracts



Sources: FOW TRADEdata; Futures Industry Association.

Exchanges have devoted considerable resources to the development of new types of equity-related contracts. Some of the reasons for this include: evidence that established stock index instruments had reached the "mature" phase of their life cycle; a desire to capitalise on an expanding investor base (particularly given the growing importance of private pension plans and the development of a retail equity culture); and investors' demand for more precisely tailored trading instruments. Limited opportunities for the introduction of new fixed income and currency contracts, given the strength of competition from the OTC market, may also have played a role. The most significant innovations are reviewed below.

Long-Term Equity Anticipation Securities (LEAPS). LEAPS are long-term American-style options on specific stocks and stock indices. The first LEAPS were introduced in 1990 by the CBOE. They generally offer maturities of up to three years, rather than a few months as is the case with standard options, and become fungible with standard options when their remaining maturity reaches that of ordinary options. The time value of such options declines at a slower pace than is the case for regular options, giving investors extra time to make decisions about their positions.

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[1] This pattern is not reflected in the dollar value statistics produced by the BIS because coverage is limited to transactions in equity index contracts. Value data are not yet available for options on single equities. The production of such data would require the establishment of a comprehensive reporting framework for the tracking of a large number of individual transactions.

[2] They were introduced by the CBOE in 1973, well ahead of the first stock index futures and options, which were introduced in 1982 and 1983 respectively by the KCBT and the CBOE.

Low exercise price options (LEPOS). LEPOS are European-style call options whose exercise price is set very close to zero. They were first introduced in Switzerland in the early 1990s as a means of overcoming problems resulting from a stamp duty on securities transactions and of creating a risk transfer mechanism for shares that were not easily transferable. Since such options are deeply in the money, investors obtain an exposure that is nearly equivalent to that of the underlying securities (or to that of a forward transaction), with the exception that they forgo dividends and voting rights.

Flexible exchange listed options (FLEX options). FLEX options were introduced by the CBOE in 1993 in response to institutional investors' growing demand for a wider variety of terms as well as strong competition from the OTC market. FLEX options, which are generally designed for large transactions, enable investors to customise a number of features of individual or index stock options, such as the strike price, expiration date and exercise style. The introduction of a new customised feature leads to the creation of a new series of options, which is then listed.

Futures and options on sectoral and regional indices. The number of index instruments based on specific sub-segments of equity markets has expanded rapidly in recent years. Such contracts allow traders to take exposures to narrower market segments and to engage in a range of trading strategies in which one market segment can be traded against another. With the buoyancy of technology stocks in the second half of the 1990s, exchanges listed a large number of index instruments on such stocks. The introduction of the euro also led to the creation of several contracts based on pan-European indices.[3] Such contracts aim at capitalising on a shift of trading from domestic to pan-European equity benchmarks. A major potential benefit of pan-European index contracts is that traders can now take cross-country exposures with a single margin requirement and clearing house exposure.

Online retail-targeted futures and options. Another significant innovation has been the introduction of online retail-targeted contracts. The first such contracts were introduced in 1997 by the CME (with its E-mini S&P 500 futures and options). They are characterised by a smaller contract size than established index contracts, which makes them more accessible to small investors (since margin requirements are lower), and by their online access. Some of these contracts have met with an enthusiastic response, accounting for almost 25% of the value of equity index contracts traded on the CME in the last quarter of 2000.

Futures on single equities. More recently, exchanges shifted their focus to futures on single equities. For example, in November 2000 Euronext listed such futures on eight Dutch blue-chip stocks, while in January 2001 LIFFE introduced its Universal Stock Futures on 25 European and US blue chips. The large US exchanges have also announced plans to list such contracts. Futures on single equities should provide additional liquidity to cash and derivatives markets, including a new means of hedging equity options. Interestingly, such instruments have not yet developed to a significant extent in any part of the world. In the United States, fears that they would have an adverse impact on the volatility of underlying shares led to a ban on their trading in the early 1980s.[4] Although exchanges in most other countries were not encumbered by such restrictions, trading in single stock futures failed to develop on a large scale in countries where they were listed in the 1990s (including Australia, Spain and Sweden). This lack of interest might have been related to the development of efficient forward markets (such as contracts-for-difference) or to the ability of traders to synthetically replicate futures through exchange-traded options.[5] The recent authorisation of such contracts in the United States could help make them more popular.

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[3] See Kostas Tsatsaronis, "Market practices ahead of institutional structures in pricing euro area equities: country versus sector effects", *BIS Quarterly Review*, March 2001, pp 13-14.

[4] The SEC and the CFTC expressed fears that futures contracts based on the equity or debt securities of a single issuer might have an adverse impact on the cash market for the underlying securities. In December 1981, the two agencies reached an accord stipulating that the CFTC would not be allowed to approve futures trading on any municipal security or security registered under the Securities Act of 1933. The Shad-Johnson Accord of 1982 included a temporary ban on futures contracts on single equities, which was removed in December 2000 with the passage of the Commodity Futures Modernisation Act of 2000.

[5] An investor could replicate a futures contract by buying a call option and selling a put option at the same strike price (and delta ratio). While more expensive and complex than a single futures transaction, such a buy/sell strategy would offer greater flexibility to the investor since he could at any time react to changes in the volatility of the separate put and call options by selling one or the other segment.