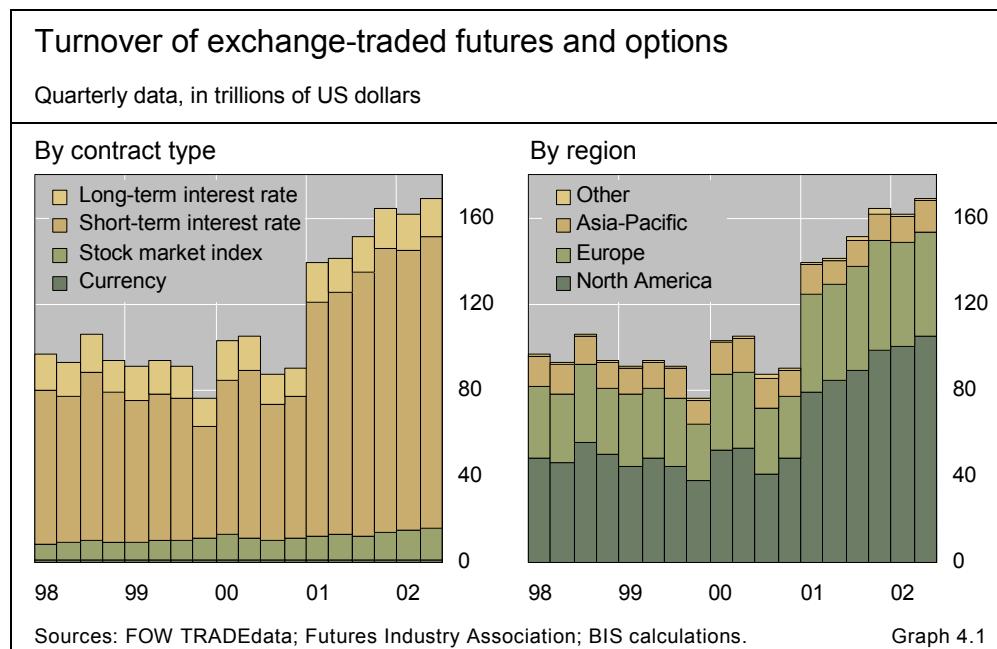


4. Derivatives markets

The aggregate turnover of exchange-traded financial derivatives contracts monitored by the BIS rose by 4% to \$169 trillion in the second quarter of 2002, following a 2% drop in the previous quarter (Graph 4.1). The increase in activity was spread across the three major risk classes, with the most robust expansion taking place in the small currency segment.

The growth of activity was surprisingly modest given the steady stream of unsettling events observed during the quarter (see “Overview” on page 1). This is probably due to the fact that there were no major monetary policy surprises requiring market participants, and large financial institutions in particular, to make quick adjustments to the duration of their balance sheets. Such adjustments were a major contributor to the growth of exchange-traded business last year.

However, activity rose abruptly in July as market conditions took a turn for the worse. Further revelations of accounting irregularities, including WorldCom’s large restatement of its earnings on 25 June, precipitated a sharp plunge in global equity markets. Preliminary turnover data for July show a 29% rise in the number of financial contracts traded compared to June, with several



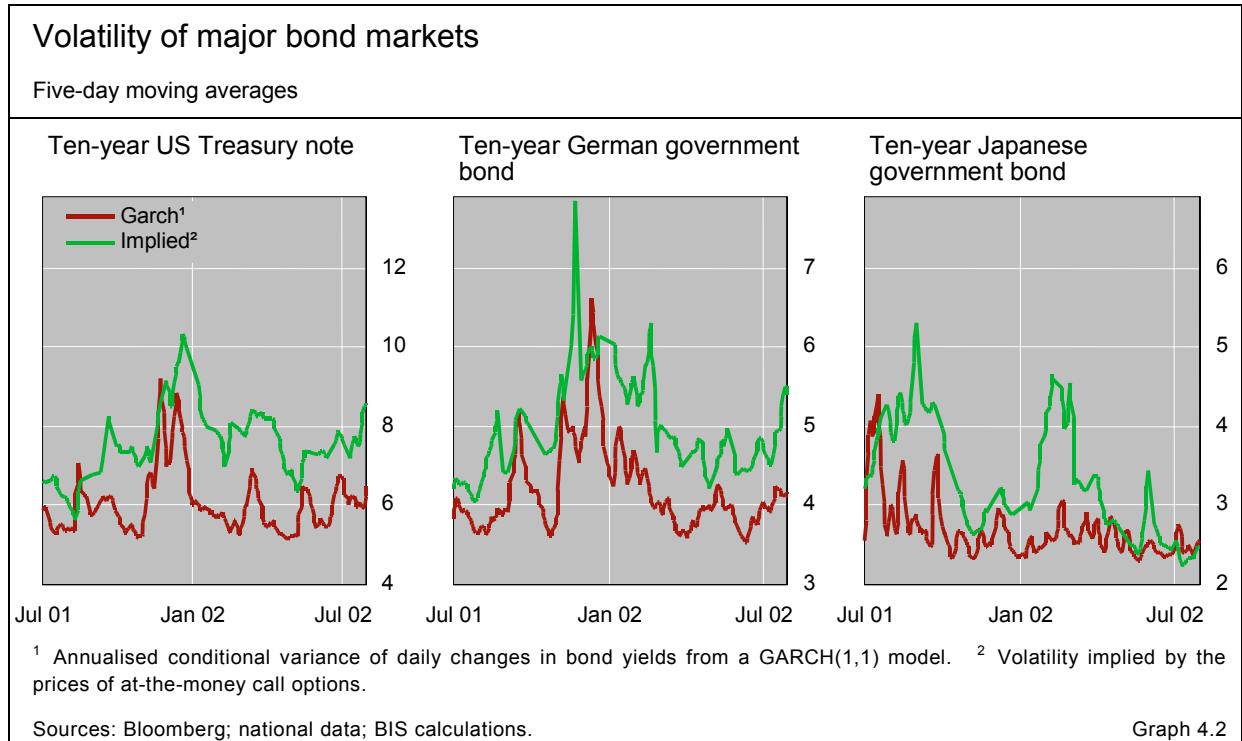
exchanges reporting new trading records. Much of this rise took place in stock index contracts as investors sought to hedge their underlying positions.

Modest expansion of business in interest rate products

Trading in exchange-traded interest rate contracts rose by 4% to \$152.8 trillion in the second quarter of 2002, compared with a 2% contraction in the first quarter. Although business in interest rate products remained robust by historical standards (Graph 4.1), the overall increase in activity was surprisingly modest. Market participants were confronted with a steady stream of unsettling events during the course of the quarter, which probably sustained speculative activity. However, the lack of monetary policy actions or surprises in the largest economies made it less necessary for major financial institutions to use fixed income derivatives for a rapid adjustment of the duration of their balance sheets. In fact, expectations of monetary tightening were scaled back in a fairly gradual fashion as downward pressure on equity markets exacerbated doubts about a global economic recovery. This progressive change in expectations was illustrated by the fairly stable pattern of volatility observed in major government bond markets for much of the second quarter (Graph 4.2).

Lack of monetary policy surprises limits use of interest rate products

It should be noted, however, that developments at the end of the quarter, most notably WorldCom's restatement of its accounts, led to renewed market instability and, consequently, to an upswing in the turnover of fixed income contracts in July.



Sustained activity in money market contracts

Variation in money market activity across regions

Money market contracts, which account for the bulk of turnover in interest rate instruments, expanded by 4% to \$134.9 trillion. There was a significant variation in short-term activity across the major trading zones in the second quarter. Trading in North America, which accounts for nearly 70% of global short-term activity, rose by 4%, while business in Europe was flat. Trading in the Asia-Pacific region was very robust, with turnover rising by 17%. Much of this sharp increase resulted from active business in eurodollar contracts on the Singapore Exchange.

Short-term products remain buoyant as hedging and trading practices change

The market for short-term interest rate products, particularly eurodollar and euribor contracts, has been notably buoyant since the end of 2000, owing largely to monetary easing but also to changes in hedging and trading practices. One of those changes involves a move by some investors away from their traditional longer-term trading and hedging vehicles, such as government securities and related futures contracts, to over-the-counter (OTC) interest rate swaps and swaptions (due to a lack of liquid exchange-traded alternatives).¹ In turn, the shift to swaps and swaptions has had a second-round impact on the turnover of money market futures and options since such instruments are commonly used in the hedging of OTC contracts. Some large market participants, such as mortgage banks and investors in mortgage-backed securities, have also stepped up their use of swaps and swaptions.

Weak growth of government bond contracts amid shift in composition of activity

Divergence in long-term activity across regions

Trading in longer-term interest rate contracts, principally on government bond rates, expanded at a somewhat slower pace than that in short-term instruments, with transactions rising by 2% to \$17.9 trillion. Here again, there was a divergence in activity across geographical areas. Business in Europe, which accounts for 54% of global turnover in long-term contracts, declined by 3%, while activity in the Asia-Pacific region contracted by 5%. By contrast, trading in North American markets grew by 13%. The steepening of the US Treasury yield curve during the second quarter probably created some trading opportunities in Treasury note contracts, but market commentary also suggests that some important hedgers, such as US mortgage lenders, returned to a more active use of such contracts.

Shift in the composition of activity

One of the most notable developments in the market for government bond contracts has been a shift towards shorter maturities (Graph 4.3). For example, trading in Chicago Board of Trade (CBOT) five- and 10-year US Treasury note contracts has increased steadily since the end of 1999, at the expense of the 30-year US Treasury bond contract. In fact, the 10-year Treasury note future

¹ The factors underlying such a shift have been discussed in past issues of the *BIS Quarterly Review*, including in an article by Philip D Wooldridge "The emergence of new benchmark yield curves", December 2001, pp 48–57.

Exchanges introduce a number of new contracts

The second quarter of 2002 witnessed the introduction of several new contracts, including a few on interest rate swaps. In early April, the Chicago Mercantile Exchange (CME) became the third major exchange – after LIFFE and the CBOT – to introduce contracts on swap rates. The mechanics of the new contracts on two-, five- and 10-year swap rates differ slightly from those of their predecessors, but their key characteristics as management tools for corporate and financial sector risks are fairly similar. One important difference is that the design of the CME futures is closer to that of its eurodollar contracts than to other competing swap contracts.^① The new contracts will be priced according to the well established International Monetary Market pricing style, whereby the price is derived by subtracting the swap rate from par (100 – swap rate = price). This means that the contract will not allow for convexity, unlike the coupon bearing securities that the contract will be meant to hedge.^② It should be noted, however, that the CME's swap contracts have not yet been actively traded.

In June, the CBOT introduced a new contract on five-year swap rates. The launch of this contract followed the successful introduction in October 2001 of a 10-year swap future.^③ Although the 10-year swap contract accounts for only a small share of overall trading in fixed income contracts on the CBOT (about $\frac{1}{3}$ of 1% in the second quarter), it is already trading slightly more actively than the 10-year agency note contract. The contract is benefiting from the growing role played by interest rate swaps in US financial markets.

Also in June, LIFFE began to offer Swapnote contracts on two-, five- and 10-year dollar-denominated swap rates. The principal difference between the dollar contracts offered by LIFFE and those traded on US exchanges is that LIFFE's contracts will be based on annual rather than semiannual compounding.

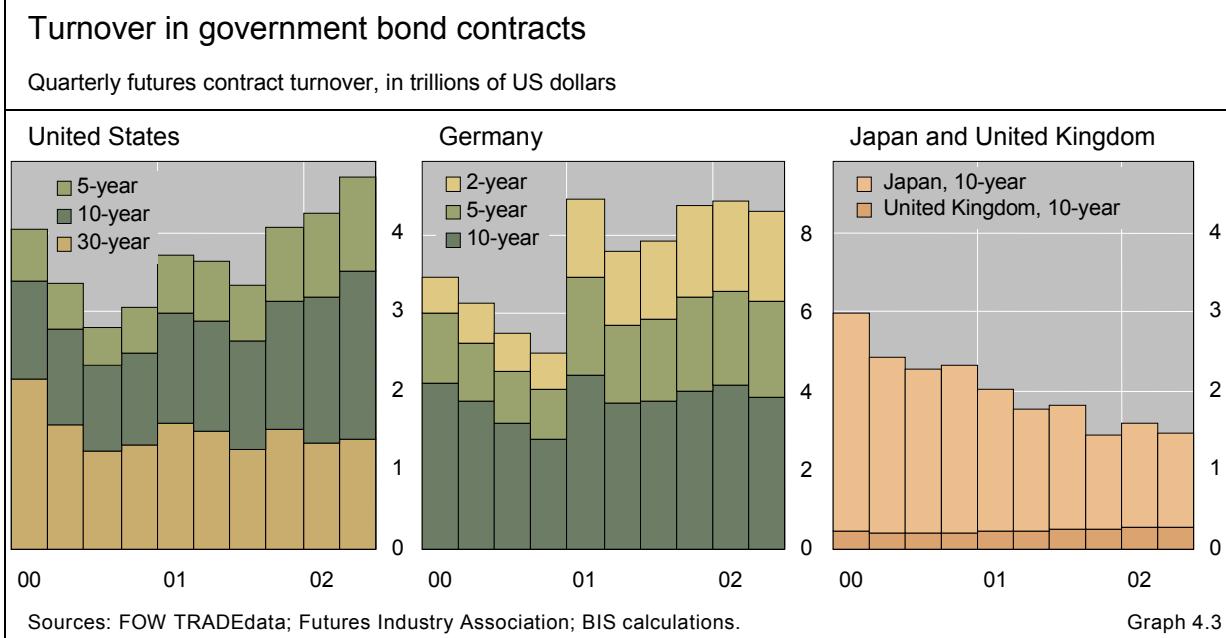
In the same month, LIFFE also launched a future on two-year German government Treasury notes (or "schatz", for *Bundesschatzanweisungen*). The new contract will compete with Eurex's well established schatz contract. In order to attract trading demand, the LIFFE future differs slightly from the original Eurex contract, including a doubling of its size (to €200,000) and the availability of finer price setting (through a smaller tick size).

Finally, in May the Chicago Board Options Exchange (CBOE) and the Pacific Exchange began trading options on Diamond Trust, an exchange-traded fund (ETF).^④ ETFs have expanded rapidly in recent years and exchanges see them as a promising area for the development of new contracts. Amex already lists a number of put and call options on ETFs, including on its Nasdaq-100 Index Tracking Stock, which is reportedly the most actively traded ETF in the world.

^① For a more technical exposition, see David A Boberski, "CME to launch interest rate swap futures", *Bond Focus*, SalomonSmithBarney, 29 January 2002. ^② By contrast, the contracts traded on LIFFE and the CBOT both feature coupon bearing pricing, which makes them convex. ^③ See the March 2002 issue of the *BIS Quarterly Review* for a more detailed discussion of the CBOT's swap futures contract. ^④ ETFs are exchange-traded securities (or index funds) that are backed by an underlying basket of stocks. The basket of underlying securities can be expanded or reduced in accordance with the strength of investor demand, which makes them similar in nature to open-ended mutual funds. However, in contrast to conventional mutual funds, which are generally purchased or redeemed only at end-of-day prices, ETFs may be bought and sold at intraday prices throughout the trading day.

has overtaken the Treasury bond contract as the most active US bond contract since the third quarter of 2001. A shift by the US Treasury to shorter debt maturities, combined with an announcement in October 2001 that it would halt sales of 30-year Treasury bonds, affected the liquidity of the Treasury bond market and contributed to the contract's trend decline.

A similar evolution appears to be taking place in European government bond contracts. The 10-year German government bond future traded on Eurex (Euro Bund) has failed to make further gains since the record volume of trading recorded in the first quarter of 2001, while the two- and five-year contracts (Euro Schatz and Euro Bobl) have made steady inroads.



Trading in stock index contracts continues to be boosted by expansion in Asia

Overall activity in equity index contracts reached a new record high in the second quarter of 2002, with business expanding by 11% to \$15.4 trillion. Turnover rose sharply in June as new corporate irregularities took their toll on global equity markets (Graph 4.4).

Rapid expansion of Korean stock index options

Although turnover was fairly buoyant in all major geographical areas, more than half of the absolute increase in business resulted from the rapid development of trading in Korean stock index contracts (Graph 4.5). Business in these Korean contracts rose by 27% in the second quarter to \$3.7 trillion, with options accounting for 91% of the total. As a result, the Korean marketplace is now the second most active after that of the United States, where stock index transactions amounted to \$7.6 trillion. Korean turnover is also now significantly higher than that on all European exchanges put together, which amounted to \$3.2 trillion in the most recent period. The exclusion of trading in Korean stock index contracts reduces the overall rate of expansion of that market segment to 7%, with turnover in North American instruments rising by 8% and that in European ones growing by 5%.

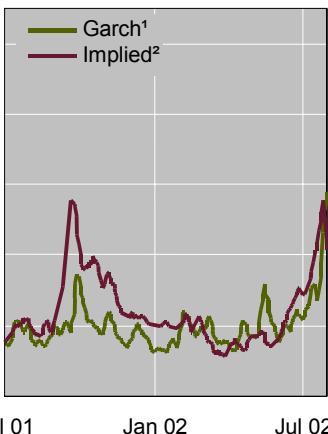
Changing pattern of activity in stock index contracts

As with the market for long-term interest rate instruments, stock index contracts have also witnessed some changes in the pattern of activity in recent periods. For example, the CME's S&P 500 future, long the most important stock index contract in the world, has been rapidly losing ground to its e-mini S&P 500 contract. With its small size (one fifth of the value of the standard S&P 500 contract) and electronic trading during both regular trading hours and out of hours, the e-mini contract has been well received by retail investors.

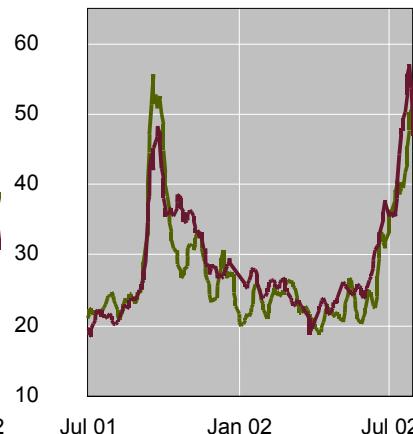
Volatility of major equity markets

Five-day moving averages

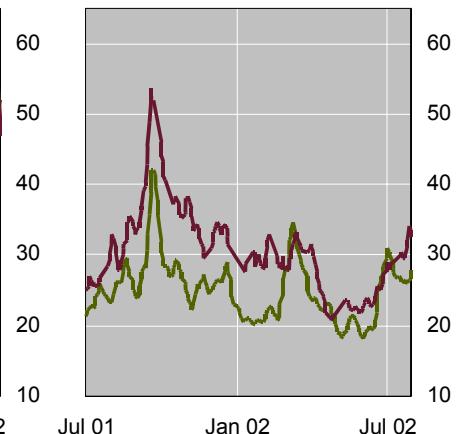
S&P 500



Dax 100



Nikkei



¹ Annualised conditional variance of daily stock returns from a GARCH(1,1) model. ² Volatility implied by the prices of at-the-money call options.

Sources: Bloomberg; national data; BIS calculations.

Graph 4.4

Tentative revival of currency contracts

Currency contracts, which account for less than 1% of overall trading in financial instruments, grew by 19% in the second quarter of 2002, to \$808 billion. Such contracts appear to have been recovering in recent quarters from a long period of decline. This recovery stems largely from a significant increase in the turnover of dollar/euro futures traded on the CME. Trading in the CME's major European "legacy" contracts (dollar/Deutsche mark and dollar/French franc) had declined sharply ahead of the introduction of the euro in early 1999. Although the new dollar/euro contract has since replaced legacy contracts, its turnover has yet to match the high volumes achieved by legacy contracts in the mid-1990s.

Significant increase of euro/dollar contracts

Sharp jump in global trading in July

Preliminary data on the global turnover of financial contracts for the month of July show that the number of units traded rose by 29% (to 412 million) compared to June, with several exchanges in Asia, Europe and North America reporting new monthly trading records.² Much of the sharp increase observed relative to June stemmed from a 41% rise in the number of stock index transactions, principally in Asia and North America. The confidence of investors in equity markets was further damaged by new revelations of accounting irregularities (illustrated by the upsurge in equity market volatility in July; Graph 4.4), including WorldCom's earnings restatement at the end of

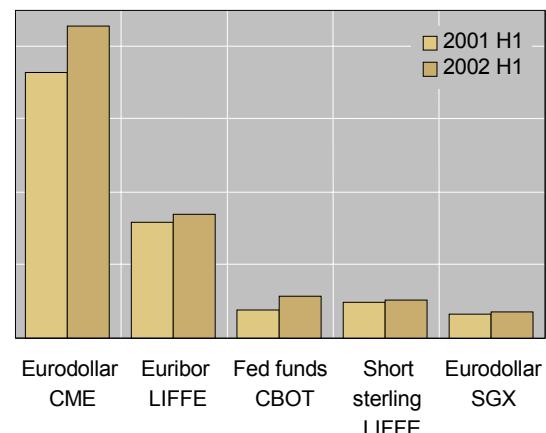
Renewed market turbulence in July

² Statistics on the dollar value of transactions monitored by the BIS were not available at the time of this writing.

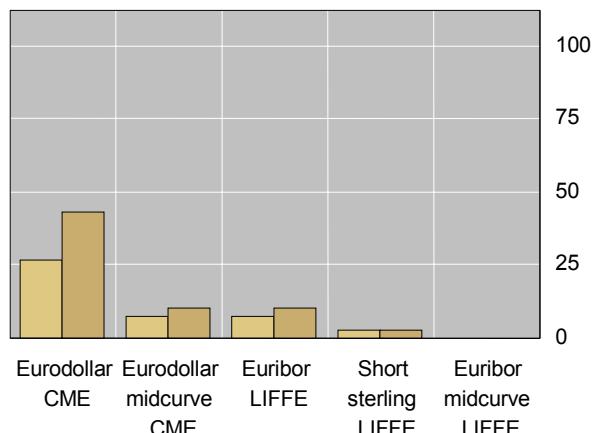
Value of turnover for the most active exchange-traded contracts

In trillions of US dollars

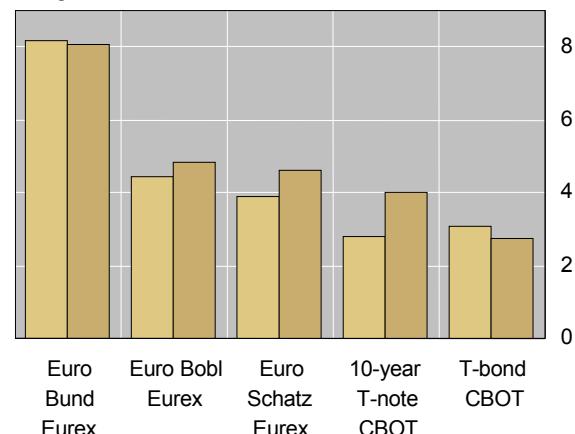
Short-term interest rate futures



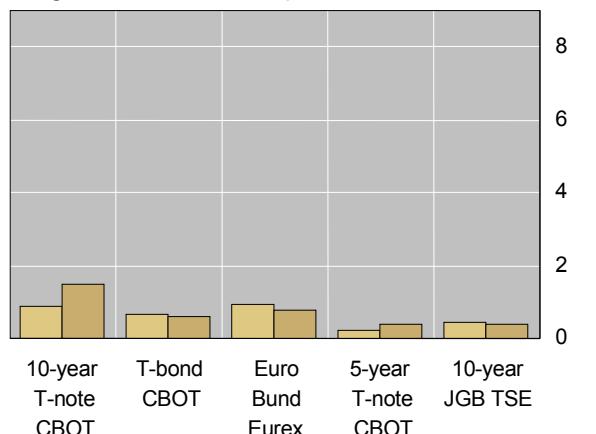
Short-term interest rate options



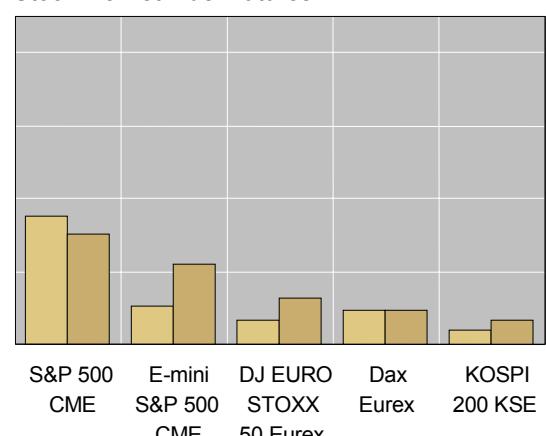
Long-term interest rate futures



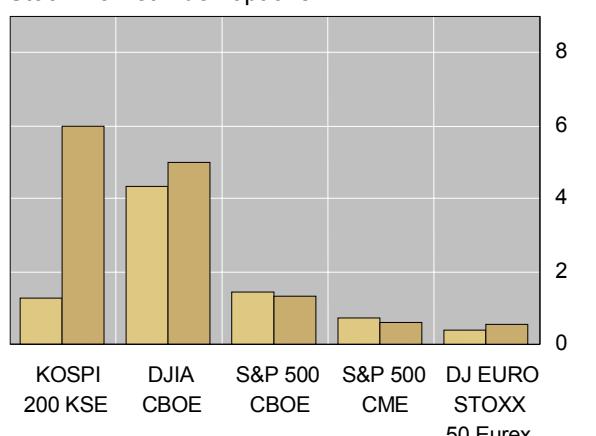
Long-term interest rate options



Stock market index futures



Stock market index options



Sources: FOW TRADEdata; BIS calculations.

Graph 4.5

June. These developments appear to have accounted for the upswing in transactions as investors presumably sought to protect the value of their equity holdings.

Markets remain dominated by a narrow group of products

Despite their buoyancy, exchange-traded derivatives markets are still dominated by a narrow group of products (Graph 4.5). The five most active money market futures accounted for almost 95% of global turnover in the first half of 2002. With market participants tending to use one short-term instrument per major time zone, few new contracts have succeeded in capturing market share in recent years. One exception has been midcurve options on interest rate futures,³ which have managed to establish themselves on the CME.

Trading is concentrated in a few money markets

Trading in longer-term fixed income futures is slightly less concentrated than is the case for money market contracts, with the five largest longer-term interest rate futures accounting for 77% of global activity in such instruments in the first half of 2002. In large part, this reflects the greater opportunities for positioning along the longer-term segment of the yield curve.

In the case of stock index futures, concentration is lowest for stock index futures, with the top five futures accounting for 63% of total trading. This can be explained to some extent by the introduction in recent years of a number of index contracts based on various subsegments of equity markets.

³ Standard options provide for the delivery of underlying futures with the same maturity as the options, whereas midcurve options provide for the delivery of positions in longer-dated futures. Such options enable market participants to manage long-term exposures and to benefit from a wider range of plays on market volatility.