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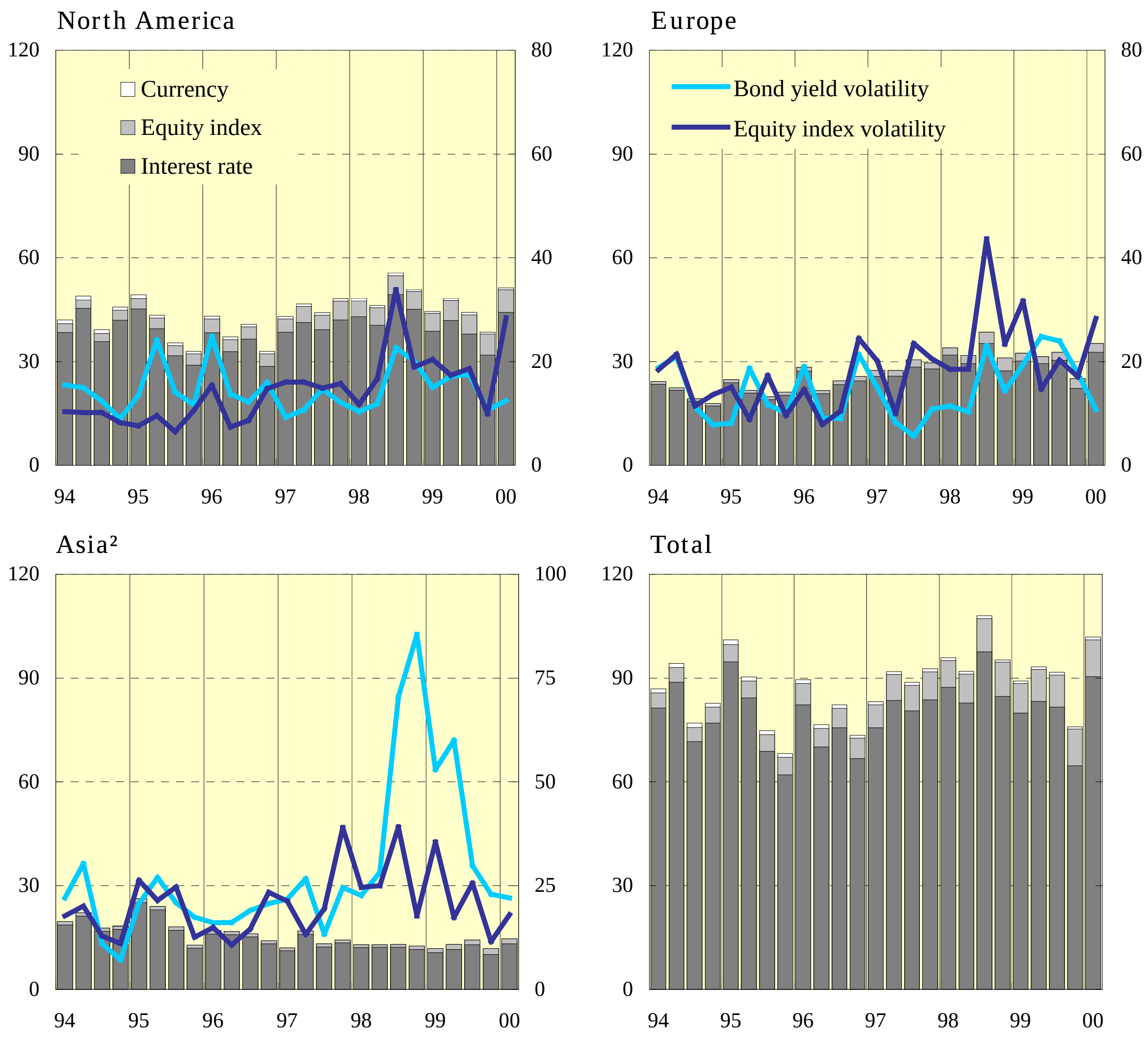
3. Derivatives markets

Exchange-traded business recovered strongly in the first quarter of 2000 from the slowdown seen at the end of last year, with much of the upsurge taking place in fixed income instruments. Somewhat surprisingly, the high level of activity seen on global equity markets, particularly in the high-technology sector, did not spill over to derivatives exchanges. With respect to over-the-counter (OTC) products, the most recent data published by the BIS show an acceleration of activity in the second half

Quarterly turnover of exchange-traded options and futures and bond yield and equity index volatilities[1]

In trillions of US dollars (left-hand scale) and percentages (right-hand scale)



[1] Annualised standard deviation of daily percentage changes in 10-year government bond yields and equity indices of US, German and Japanese markets for North America, Europe and Asia respectively. [2] Including Australia and New Zealand.

Sources: FOW TRADEdata; Futures Industry Association; BIS.

of 1999. This was in contrast to activity on exchange-traded markets, which experienced a decline over the same period. Much of the growth in business occurred in the interest rate swaps market, particularly in the euro and yen segments. A subdued level of activity in dollar swaps indicates a decline in arbitrage activity involving US Treasury securities and swaps.

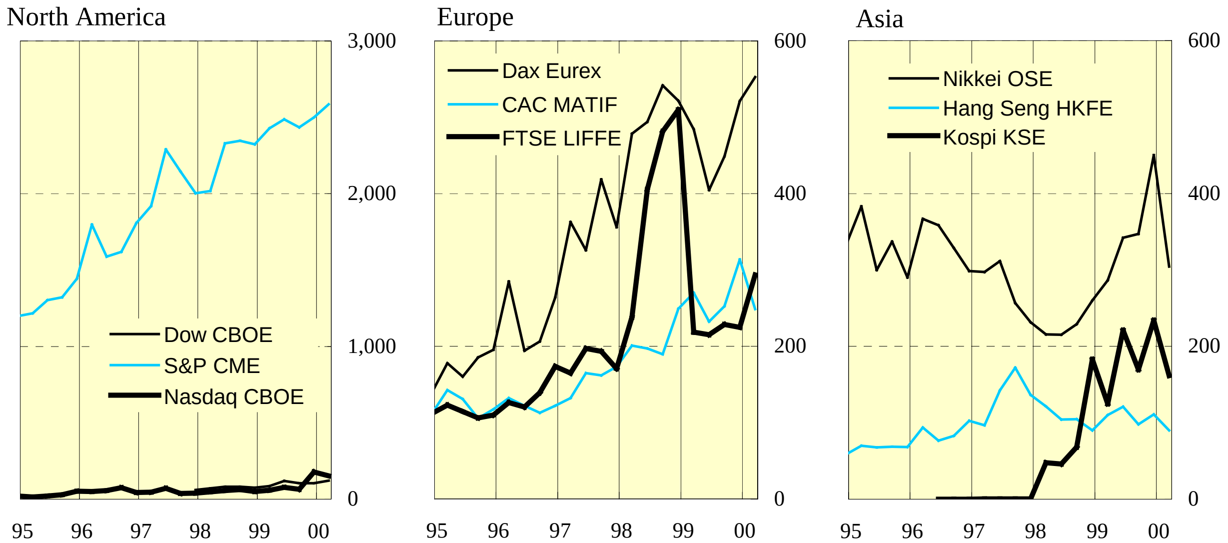
Exchange-traded instruments: a strong recovery follows the millennium slowdown

The return of financial market participants to more active trading in the first quarter of 2000 led to a sharp rebound in the aggregate turnover of exchange-traded financial derivative contracts monitored by the BIS (see the graph on the previous page).[5] The dollar value of turnover rose by 34%, to $102 trillion, the highest figure since the record $107 trillion observed in the third quarter of 1998. This upswing was, however, not entirely unexpected. Market participants had pared down their positions to a minimum in the fourth quarter of 1999 but the smooth transition to the new millennium quickly brought activity to more normal levels. A “catching-up” effect is also likely to have played a role.

The overall recovery of activity was nevertheless accompanied by some unusual trading patterns. Indeed, despite the widespread rise in equity market volatility, total trading in index-linked products remained flat (at about $11 trillion). This lack of buoyancy contrasted markedly with the record level of activity seen on some of the major equity contracts (see the graph below) and the high level of turnover in world equity markets. Moreover, the buoyancy of activity in high-technology stocks failed to spill over to related equity index contracts. Although the equity index segment had been less affected by the Y2K slowdown, the subdued level of activity is probably the result of deeper underlying factors. Equity index contracts which offer a broad exposure to equity markets might have

Turnover of major equity futures

Quarterly turnover in billions of US dollars

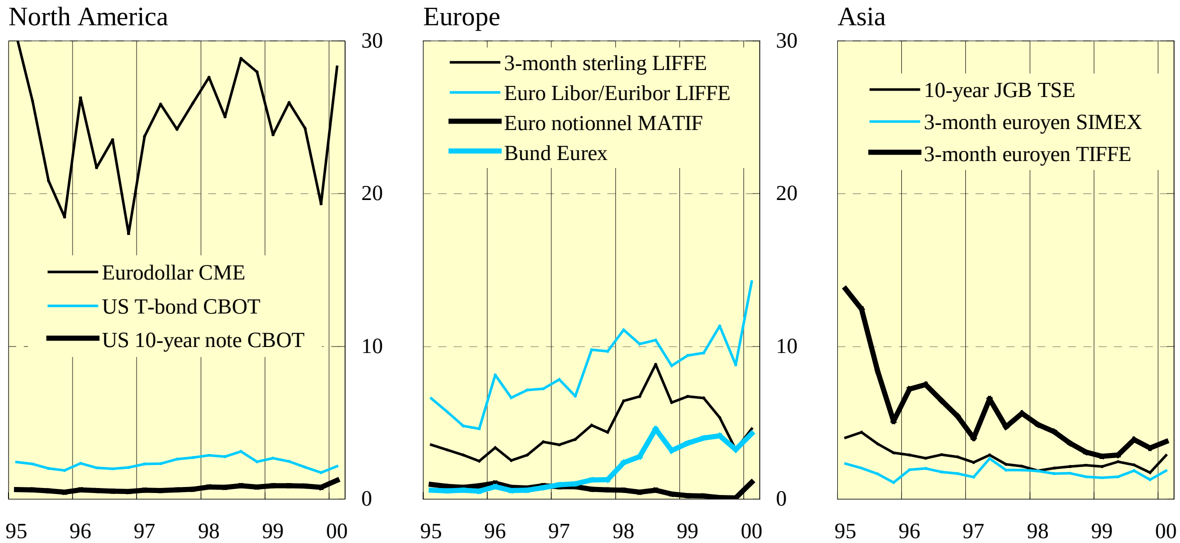


Sources: Futures Industry Association; FOW TRADEdata.

5 The analysis is based on the dollar value of trading in fixed income, currency and equity index contracts. Value-based reporting reduces the impact on the aggregate figures of fluctuations in the turnover of small contracts and removes the distortions resulting from sudden changes in the unit value of contracts. However, such reporting has not yet been extended to commodity contracts or to options on single equities. For this reason, the analysis of activity by market risk categories is conducted on a value basis, while the ranking of exchanges is carried out using the total number of contracts traded (both financial and non-financial).

Turnover of major interest rate futures

Quarterly turnover, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS.

been less suitable for dealing with the risks of particular companies or sectors subject to sharp market swings. The lack of futures contracts permitting focused risk exposures may have led to some displacement of trading towards underlying securities and options on single equities (which are not included in the BIS value calculations). This may have been the case for retail investors in particular, who have expressed growing enthusiasm for stock picking. The strong increase in the price of traded options might also have deterred potential end-users of such products, leading them to seek cheaper bespoke structures in the OTC market (see the next subsection).

The story was quite different for exchange-traded fixed income derivatives in the first quarter of 2000, when the strong upsurge in activity (by 40%, to over $90 trillion) was spread across most geographical areas (see the graph above). Uncertainty about the extent of further monetary tightening in North America and Europe probably fuelled the particularly sharp recovery of money market instruments, with futures on eurodollar and Euribor rates rising by 46% and 62% respectively. Although conditions in the longer-term segment of the US yield curve became more volatile in February, following the US Treasury's announcement of a debt retirement programme centring on 30-year issues, the 23% increase in the trading of US Treasury bond futures largely reflected a rebound from the depressed levels seen at the end of last year. Activity in the US Treasury bond contract has been on a declining trend since the 1998 financial crisis. The environment was calmer in European bond markets but the growing use of the bund contract as a European benchmark was reflected in a 33% increase in its turnover.

There was also a broad-based recovery in the much smaller foreign exchange segment (by 17%, to $0.7 trillion). The continuing weakness of the euro against the US dollar and the yen was associated with more active use of trading instruments on those two currency pairs. With the euro breaching parity with the dollar, and with risk reversals showing that investors were concerned about a sharp depreciation of the euro, implied volatility on the dollar/euro pair reached a record high. Looking at the competitive position of exchanges, strong increases in the volume of a few options products enabled the CBOE to further strengthen its leading position in North America. In Europe, the sustained growth of contracts on German government bonds and the rapid expansion of the recently introduced DJ Euro STOXX 50 contract further reinforced the strong position achieved by Eurex. It is worth noting, however, that attempts by French banks to revive the French government bond contract appear to have borne fruit as turnover in the Euro notionnel recovered from a long period of decline.

Meanwhile, some of the recent structural trends seen in capital markets began to have a bearing on product innovation. In fixed income markets, a shrinking or slowing supply of government debt continued to encourage large issuers to introduce alternative trading benchmarks. In March the CBOT and the CME capitalised on the interest in such benchmarks by launching contracts on the debt securities of US government-sponsored financing agencies.[6] Volumes for April, the first full month of trading, show that the CBOT was able to benefit from its dominance in longer-term instruments, taking the lead in 10-year agency futures.[7]

Declining opportunities in standard fixed income and equity contracts also prompted exchanges to explore new business areas such as the trading and clearing of cash market securities and OTC contracts. In addition, some exchanges now seem to believe that the advantages conferred by their efficient clearing services could be profitably put to use outside the financial industry. LIFFE, for example, intends to develop a business-to-business portal that could be used for a variety of non-financial products and services.

OTC instruments: a return to growth in the second half of 1999

In May 2000, the BIS released its semiannual statistics on positions in the global OTC derivatives market for end-December 1999. These statistics constitute the fourth set of data released under a new regular reporting framework on OTC market activity. They include the *notional amounts* and *gross market values* outstanding of the *worldwide consolidated* OTC derivatives exposure of major banks and dealers in the G10 countries (see the table on the next page and Annex Tables 18-21).[8]

After adjustments for double-counting resulting from positions between reporting institutions, the total estimated notional amount of outstanding OTC contracts stood at $88.2 trillion at end-December 1999, an 8% increase over the amount reported for end-June 1999. This represents a significant acceleration relative to the first half of 1999, when business had expanded by a mere 1% from the previous half-year. Similar growth patterns have been reported by other surveys of OTC market activity.[9] On the other hand, the stock of exchange-traded contracts monitored by the BIS experienced a 6% contraction in the second half of 1999. This followed a 2% decline in the first half of that year.

The return to growth of the OTC market was essentially concentrated in the interest rate segment, with an increase in outstanding contracts of 11% over the previous half-year period (to $60.1 trillion). By contrast, there was a further contraction of foreign exchange instruments, which declined by 4% (to $14.3 trillion). The reduction of activity in this segment had been particularly pronounced in the first half of last year (17%), in the wake of the introduction of the single European currency. The much smaller equity-linked and commodity segments expanded the most rapidly of all underlying risk categories, with increases of 20% and 24% respectively (to $1.8 trillion and $0.5 trillion).

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6 The CBOT launched futures and options on 10-year securities, while the CME introduced futures on five- and 10-year securities.

7 With more than 92,000 contracts traded on the CBOT compared with slightly more than 4,000 on the CME.

8 The notional amount, which is generally used as a reference to calculate cash flows under individual contracts, provides a comparison of market size between related cash and derivatives markets. Gross market value is defined as the sum (in absolute terms) of the positive market value of all reporters' contracts and the negative market value of their contracts with non-reporters (as a proxy for the positive market value of non-reporters' positions). It measures the replacement cost of all outstanding contracts had they been settled on 31 December 1999. The use of notional amounts and gross market values produces widely divergent estimates of the size of the overall market and of the various market segments.

9 For example, data released by the International Swaps and Derivatives Association (ISDA) show that the outstanding stock of interest rate swaps, currency swaps and interest rate options grew by 11% in the second half of 1999. This represented an acceleration relative to the first half of the year, when business had only expanded by 3%. Quarterly data published by the US Office of the Comptroller of the Currency on holdings of derivatives by US banks (largely OTC contracts) also showed more rapid growth in the second half of 1999, to 5% from zero growth in the first half.

The global over-the-counter (OTC) derivatives markets[1]

Amounts outstanding, in billions of US dollars

	Notional amounts				Gross market values			
	End-June 1998	**End-Dec 1998**	**End-June 1999**	**End-Dec 1999**	**End-June 1998**	**End-Dec 1998**	**End-June 1999**	**End-Dec 1999**
Grand total	**72,143**	**80,317**	**81,458**	**88,201**	**2,580**	**3,231**	**2,628**	**2,813**
A. Foreign exchange contracts	**18,719**	**18,011**	**14,899**	**14,344**	**799**	**786**	**582**	**662**
Outright forwards and forex swaps	12,149	12,063	9,541	9,593	476	491	329	352
Currency swaps	1,947	2,253	2,350	2,444	208	200	192	250
Options	4,623	3,695	3,009	2,307	115	96	61	60
B. Interest rate contracts[2]	**42,368**	**50,015**	**54,072**	**60,091**	**1,160**	**1,675**	**1,357**	**1,304**
FRAs	5,147	5,756	7,137	6,775	33	15	12	12
Swaps	29,363	36,262	38,372	43,936	1,018	1,509	1,222	1,150
Options	7,858	7,997	8,562	9,380	108	152	123	141
C. Equity-linked contracts	**1,274**	**1,488**	**1,511**	**1,809**	**190**	**236**	**244**	**359**
Forwards and swaps	154	146	198	283	20	44	52	71
Options	1,120	1,342	1,313	1,527	170	192	193	288
D. Commodity contracts[3]	**451**	**415**	**441**	**548**	**38**	**43**	**44**	**59**
Gold	193	182	189	243	10	13	23	23
Other	258	233	252	305	28	30	22	37
Forwards and swaps	153	137	127	163	..	..	..	..
Options	106	97	125	143	..	..	..	..
E. Other[4]	**9,331**	**10,388**	**10,536**	**11,408**	**393**	**492**	**400**	**429**
Gross credit exposure[5]					**1,203**	**1,329**	**1,119**	**1,023**
Memorandum item: Exchange-traded contracts[6]	*14,792*	*13,932*	*14,440*	*13,522*	..	..	..	..

[1] All figures are adjusted for double-counting. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers. Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. [2] Single-currency contracts only. [3] Adjustments for double-counting estimated. [4] For end-June 1998: positions reported by non-regular reporting institutions in the context of the triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity; for subsequent periods: estimated positions of non-regular reporting institutions. [5] Gross market values after taking into account legally enforceable bilateral netting agreements. [6] Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges.

While the acceleration of activity in the *interest rate segment* largely took place in the swaps market (15% to \$43.9 trillion), the expansion of business in the options market was also fairly sustained (9% to \$9.4 trillion). The forward rate agreement market, which had experienced a sharp increase in the first half of 1999, contracted by 5% to \$6.8 trillion. The most recent data on the OTC interest rate market have confirmed the rapid development of non-dollar instruments. Indeed, while euro- and yen-denominated contracts accounted for the bulk of market expansion, the increase in dollar business was marginal. This enabled the euro-denominated sector to grow further in size and reinforce its lead over the US dollar segment (34% of outstandings versus 27%). The lethargic pace of activity in the latter segment is somewhat difficult to reconcile with reports of growing use of interest rate swaps as hedging and positioning alternatives to US Treasury securities. The withdrawal of certain US-based financial institutions from arbitrage activity since the crisis at the end of 1998, the paring-down of market-making capital by other institutions and the adoption of more conservative risk management policies might have reduced market liquidity and, therefore, hampered dollar business.

In the area of *currency instruments*, the stock of outright forward and forex swap contracts was stable following the sharp drop resulting from euro-related consolidation in the previous period. This was not

the case with the stock of currency options, which declined for the fourth consecutive half-year period. Meanwhile, business in currency swaps continued to exhibit a steady upward trend. A look at the currency breakdown for all types of foreign exchange positions reveals that activity moderated in contracts involving the three major world currencies, with the most pronounced decline being in yen contracts. Although the review period was marked by rising currency volatility, which could have been expected to fuel turnover, the steady strengthening of the yen against the two other major currencies might have led to a drying-up of some options products involving the yen, such as barrier options.[10] Moreover, the lower level of activity in currency derivatives might also have been the result of subdued activity in the underlying markets. Informal estimates by market participants suggest that there has been a sizeable decline in foreign exchange turnover in the major centres since autumn 1998.[11]

The *equity-linked sector* sprang to life in the second half of last year, with growth in outstandings of 20% (to $1.8 trillion). Business is likely to have been fuelled by the very strong performance of global equity markets during the review period. The most striking development in this market sector was the particularly pronounced increase in business with non-financial customers.

Commodity derivatives markets were also highly active, with amounts outstanding rising by 24% (to $548 billion). Transactions involving gold, the largest single component of the commodity derivatives market, were particularly buoyant. The review period was eventful for the broader gold market. The metal's price, which had followed a downward trend for much of the year, rose sharply in late September following an agreement among central banks limiting official gold sales over the next five years.

Estimated *gross market values* in the second half of 1999 rose by 7%, to $2.8 trillion, but their share of reported notional amounts remained stable at 3%. Allowing for netting, the derivatives-related credit exposure of reporting institutions was much smaller ($1 trillion).

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10 Barrier options include all options for which the payoff pattern and survival to expiration depend not only on the final price of the underlying but also on whether the underlying will reach or go through a set price (barrier) during the life of the option.

11 See "A look at trading volumes in the euro", *BIS Quarterly Review*, February 2000, pp 33-35.