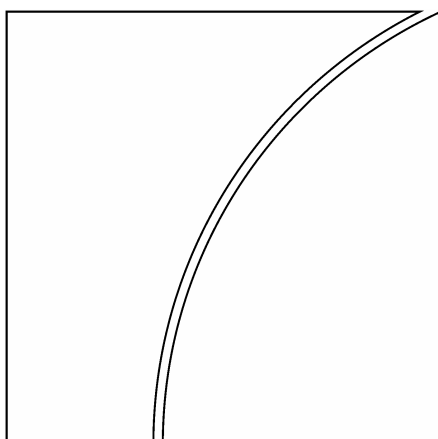




BANK FOR INTERNATIONAL SETTLEMENTS



# Triennial Central Bank Survey

Foreign exchange and derivatives market activity in 2004

March 2005

Queries concerning this report should be addressed to the authors listed below:

Sections A.1 + B:	Gabriele Galati	tel +41 61 280 8923	e-mail: gabriele.galati@bis.org
Sections A.2 + C:	Fabio Fornari	tel +41 61 280 8406	e-mail: fabio.fornari@bis.org
Section D:	Philippe Mesny	tel +41 61 280 8425	e-mail: philippe.mesny@bis.org
Section E:	Paola Gallardo	tel +41 61 280 8445	e-mail: paola.gallardo@bis.org
	Carlos Mallo	tel +41 61 280 8256	e-mail: carlos.mallo@bis.org

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## Participating official monetary institutions

The following are the official monetary institutions which provided national foreign exchange and derivatives market data, and to which requests for additional copies of this report should be addressed. Queries about the data may also be made to the BIS. The fax number is prefaced by the relevant country and area codes.

Argentina	Central Bank of Argentina	+54 11 43 483 955
Australia	Reserve Bank of Australia	+61 2 9551 8023
Austria	Austrian National Bank	+43 1 40420 3399
Bahrain	Bahrain Monetary Agency	+973 532 274
Belgium	National Bank of Belgium	+32 2 2213101
Brazil	Central Bank of Brazil	+55 61 2269513
Canada	Bank of Canada	+1 613 782 7535
Chile	Central Bank of Chile	+56 2 670 2106
China	The People's Bank of China	+86 10 6601 6725
Colombia	Bank of the Republic	+571 281 3018
Czech Republic	Czech National Bank	+420 2 2441 3460
Denmark	National Bank of Denmark	+45 33 63 7103
Estonia	Bank of Estonia	+372 668 0943
Finland	Bank of Finland	+358 9 662 546
France	Bank of France	+33 142 923 940
German	Deutsche Bundesbank	+49 69 9566 8624
Greece	Bank of Greece	+30 10 325 5503
Hong Kong SAR	Hong Kong Monetary Authority	+852 2878 2460
Hungary	Central Bank of Hungary	+36 1 331 3941
India	Reserve Bank of India	+ 91 22 2261 1427
Indonesia	Bank Indonesia	+62 21 350 1871
Ireland	Central Bank and Financial Services Authority of Ireland	+353 1 670 6871
Israel	Bank of Israel	+972 2 652 2457
Italy	Bank of Italy Ufficio Italiano dei Cambi	+39 06 4792 2086 +39 06 4663 4282
Japan	Bank of Japan	+81 3 5203 7187
Korea	Bank of Korea	+82 2 759 5736
Latvia	Bank of Latvia	+371 702 2420
Lithuania	Bank of Lithuania	+370 52121501
Luxembourg	Central Bank of Luxembourg	+352 4774 4920
Malaysia	Central Bank of Malaysia	+603 2698 5378
Mexico	Bank of Mexico	+52 55 5227 8795
Netherlands	Netherlands Bank	+31 20 524 2512
New Zealand	Reserve Bank of New Zealand	+64 4 471 3880
Norway	Central Bank of Norway	+47 22 31 6851
Peru	Central Reserve Bank of Peru	+511 427 1100
Philippines	Bangko Sentral ng Pilipinas	+632 525 3453
Poland	National Bank of Poland	+48 22 620 84 91

Portugal	Bank of Portugal	+351 21 310 7837
Russia	Central Bank of the Russian Federation	+7095 923 8196
Saudi Arabia	Saudi Arabian Monetary Agency	+966 1 466 2119
Singapore	Monetary Authority of Singapore	+65 62 299328
Slovakia	National Bank of Slovakia	+421 2 5787 2981
Slovenia	Bank of Slovenia	+386 1 251 5516
South Africa	South African Reserve Bank	+27 12 313 3675
Spain	Bank of Spain	+34 91 338 6102
Sweden	Sveriges Riksbank	+46 8 787 245348
Switzerland	Swiss National Bank	+41 1 631 8114
Taiwan, China	Central Bank of China	+886 2 2357 1959
Thailand	Bank of Thailand	+66 2 280 6059
Turkey	Central Bank of the Republic of Turkey	+90 312 3127766
United Kingdom	Bank of England	+44 20 7601 3334
United States	Federal Reserve Bank of New York	+1 212 720 1216
Bank for International Settlements		+41 61 280 9100

## A. Summary of main findings<sup>1</sup>

In April and June 2004, 52 central banks and monetary authorities participated in the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity.<sup>2</sup> They collected data for April 2004 on turnover in traditional foreign exchange markets – those for spot transactions, outright forwards and foreign exchange swaps – and in over-the-counter (OTC) currency and interest rate derivatives. Preliminary results on turnover were published in September 2004 and an analysis of the results for the traditional foreign exchange markets was included in the December 2004 *BIS Quarterly Review*.<sup>3</sup> The survey also covered data on amounts outstanding of OTC foreign exchange, interest rate, equity, commodity and credit derivatives. These data were collected at end-June 2004 and preliminary results were published in December 2004. This was the sixth global survey since April 1989 of foreign exchange market activity and the fourth survey since March/April 1995 covering also OTC derivatives market activity. This report summarises the final global results on foreign exchange market turnover and the final statistics on OTC derivatives market turnover and amounts outstanding.

### 1. Foreign exchange market turnover

The April 2004 data on turnover in traditional foreign exchange markets highlight several important changes that have occurred in these markets since the last survey was conducted in April 2001.

The 2004 survey shows a large increase in activity in traditional foreign exchange markets compared to 2001. Average daily turnover rose to \$1.9 trillion in April 2004, a 57% increase at current exchange rates and a 36% rise when volumes are measured at constant exchange rates (Table B.1).<sup>4</sup> This more than reversed the fall in global trading volumes between 1998 and 2001. Turnover rose across instruments but particularly in the spot and forward markets.

---

<sup>1</sup> Paola Gallardo and Carlos Mallo provided excellent research assistance.

<sup>2</sup> The geographical coverage of the survey has been progressively expanded, from 21 countries in 1989 to 26 countries in 1992 and 1995, 43 countries in 1998, and 48 in 2001.

<sup>3</sup> See G Galati and M Melvin, “Why has global FX turnover surged? Explaining the 2004 triennial survey”, *BIS Quarterly Review*, December 2004 ([http://www.bis.org/publ/qtrpdf/r\\_qt0412f.pdf](http://www.bis.org/publ/qtrpdf/r_qt0412f.pdf)).

<sup>4</sup> The evaluation at constant exchange rates removes the impact of exchange rate changes from the changes in nominal trading volumes. A more detailed explanation of the computation of turnover at constant exchange rates is given in Section D.

In addition to valuation effects, factors that have arguably boosted turnover include investors' interest in foreign exchange as an asset class alternative to equity and fixed income, the more active role of asset managers and the growing importance of hedge funds (Galati and Melvin (2004)).

The growth in turnover was driven by all types of counterparties. Trading between banks and financial customers rose most strongly, and its share in total turnover went up from 28% to 33% (Table B.2). Market commentary suggests that the higher activity between reporting banks and financial customers reflected to a large extent the combination of a sizeable increase in activity by hedge funds and commodity trading advisers and robust growth of trading by asset managers. This is in contrast with the period between 1998 and 2001, when activity in this market segment had been driven mainly by asset managers, while the role of hedge funds had reportedly declined. Trading between reporting dealers also rose between 2001 and 2004, although its share continued to fall, from 59% in 2001 to 53% in 2004. Restraining factors might include the continuing consolidation in the banking industry, as well as efficiency gains derived from the use of electronic brokers in the spot interbank market. For its part, the share of trading between banks and non-financial customers edged up to 14%.

Between 2001 and 2004, there were no substantial changes in the currency composition of turnover. The dollar was on one side of 89% of all transactions, followed by the euro (37%), the yen (20%) and the pound sterling (17%) (Table B.3). Dollar/euro continued to be by far the most traded currency pair in April 2004, with 28% of global turnover, followed by dollar/yen with 17% and dollar/sterling with 14% (Table B.4). The share of trading in local currencies in emerging markets increased slightly, from 4.5% to 5.2%.

The data for 2004 reveal in most countries a further decline in the number of reporting banks accounting for 75% of the market (Table B.5). This is consistent with the broad trend towards consolidation in the banking industry and the consequent reduction in the number of trading desks. While this has had a dampening effect on global turnover, this has been counterbalanced by other factors mentioned above.

The geographical distribution of foreign exchange trading did not change noticeably over the last three years (Table B.6).<sup>5</sup> The United Kingdom continued to be the most active trading centre, accounting for 31% of total turnover, followed by the United States (19%), Japan (8%), Singapore (5%), Germany (5%), Hong Kong SAR (4%), Australia (3%) and Switzerland (3%).

---

<sup>5</sup> In interpreting the geographical composition of turnover, an important caveat is that the criterion for identifying the location of a trade has changed from where the trade is executed to where the sales desk initiating the trade is located. The relative size of financial centres might not be robust to this methodological change.

## 2. OTC derivatives market activity

### 2.1 Turnover data

Global daily turnover in foreign exchange and interest rate derivatives contracts, including traditional foreign exchange derivatives (outright forwards and foreign exchange swaps) rose by an estimated 74%, to \$2.4 trillion, in the three years to April 2004 (Table C.1). At constant exchange rates, the increase was 51%, far outstripping the 10% growth recorded in the previous three-year survey.

Activity grew in both segments of the global OTC market, namely interest rate and currency products. This contrasts with the previous three-year period, when business in foreign exchange products fell even as interest rate derivatives trading rose strongly. Still, growth in the interest rate segment (up 110%) continued to exceed that in the foreign exchange segment (51%). In terms of total turnover, interest rate derivatives are now very close to exchange rate derivatives. Daily business in the two segments stood, as of end-April 2004, at \$1,025 and \$1,292 billion respectively, against \$489 billion and \$853 billion as of end-April 2001. Over the same three-year interval daily activity in exchange-traded derivatives expanded by 114%, to \$4.7 trillion. Since this volume is almost completely made up of interest rate products, the expansion of the two markets has been almost identical.

The growth of business in exchange rate derivatives is related to the 57% expansion in turnover in traditional foreign exchange markets. Higher demand in both the traditional and the derivatives segments reflects the greater role that such products have recently been playing as an alternative investment class to equity and fixed income investments, as well as the larger role of hedge funds and asset managers. In addition, the large swing in the exchange rate of the dollar vis-à-vis other major currencies between 2001 and 2004 may have increased hedging-related demand for currency derivatives. In the interest rate segment activity was boosted by changes in hedging and trading practices in the US market, which contributed to turnover in the swap segment. Business in the US swap market was probably also fuelled by the increasing demand to hedge the duration of mortgage-backed securities after the summer of 2003. Beyond these factors, turnover in the interest rate segment seems to have reflected an exceptional rise in volatility, which was both more pronounced in the United States than in Europe, and more pronounced in the short- and medium-term segments.

Trading between reporting banks and other financial institutions, mainly hedge funds, mutual funds and insurance companies, increased the most, by 132% (Table C.1). However, business also rose substantially with non-financial customers, ie firms, by 77%. For both interest rate products and currency products, activity within the group of reporting dealers recorded the lowest growth rates. Interest rate business with firms has been increasing particularly rapidly with respect to interest rate products, while trading with other financial institutions saw an expansion for both interest rate and currency instruments.

While London and New York remained the two largest marketplaces, Paris took third place for the first time (Table C.4). There was a slight increase in the

concentration of trading. The five largest marketplaces now account for 74% of trading, up from 70% three years ago. This occurred despite the fact that concentration, measured at the dealer level, has remained stable over the last six years.

## *2.2 Notional amounts outstanding and gross market values*

Notional amounts are defined as the sum of the nominal absolute value of all deals concluded and still open at the reference date, ie end-June 2004.<sup>6</sup> They are a useful benchmark for comparing transactions in spot and derivatives markets and provide information about the cumulative amount of business between June 2001 and June 2004, while turnover figures are a measure of April-related activity only. After adjusting for double-counting in local and cross-border transactions among the reporting institutions, the notional amounts of outstanding OTC contracts rose by 121% to \$221 trillion at end-June 2004 (Table C.5). This was a much faster rate of expansion than the 38% recorded in the three years between 1998 and 2001. Reflecting the developments in turnover, expansion was stronger for interest rate products than for exchange rate products. The rate of growth of outstanding amounts was also high for other risk categories, such as equity-linked contracts and commodity contracts, but it reached a peak of 568% for credit-linked contracts.

The maturity structure of outstanding positions lengthened further, with activity in long contracts higher than average activity across maturities, for both interest rate and currency products. Despite the extension of maturities, growth was robust in all maturity segments. The result is that exchange rate derivatives remain, as in June 2001, concentrated in the short maturities. More than three quarters of currency derivative products have a maturity of less than one year, against just over one third for interest rates (Tables C.7 and C.8).

Gross market values, defined as the sum of the absolute costs which a party would face if all open contracts had to be replaced, at a given reference date and prevailing market conditions, more than doubled from \$3.0 trillion at end-June 2001 to \$6.4 trillion at end-June 2004 (Table C.6). The increase in gross market values was lower than the corresponding increase in outstanding amounts (120%), so that the ratio of the two stocks decreased slightly from 3.1% at end-June 2001 to 2.9% at end-June 2004. Thus, derivatives books grew faster than the credit risk actually embodied in them. Controlling for the presence of legally enforceable bilateral netting and other risk-reducing arrangements brings the credit exposure of reporting institutions down to \$1.5 trillion.

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<sup>6</sup> See Section D for further details on the construction of notional amounts and gross market values.

## B. Traditional foreign exchange markets

### 1. Global turnover

Strong growth in global turnover ...

Foreign exchange market activity rose markedly between 2001 and 2004. Average daily turnover in traditional foreign exchange markets was estimated at \$1,880 billion in April 2004 compared to \$1,200 billion in April 2001, a 57% increase at current exchange rates and a 36% rise at constant exchange rates (Table B.1).<sup>7</sup> This increase, which did not take market participants by surprise, more than reversed the substantial fall in global trading volumes between 1998 and 2001.<sup>8</sup>

... underpinned by momentum trading ...

The strong growth in turnover appeared to be underpinned by two related factors. First, the presence of clear trends and higher volatility in foreign exchange markets between 2001 and 2004 led to momentum trading, where investors took large positions in currencies that followed persistent appreciating trends. These trends also induced an increase in hedging activity, which further supported trading volumes. Second, interest differentials encouraged so-called “carry trading”, ie investments in high interest rate currencies financed by short positions in low interest rate currencies, if the target currencies, like the Australian dollar, tended to appreciate against the funding currencies, like the US dollar. Such strategies fed back into prices and supported the persistence of trends in exchange rates. In addition, in the

... and carry trades

Global foreign exchange market turnover <sup>1</sup>						
Daily averages in April, in billions of US dollars						
	1989	1992	1995	1998	2001	2004
Spot transactions	317	394	494	568	387	621
Outright forwards	27	58	97	128	131	208
Foreign exchange swaps	190	324	546	734	656	944
Estimated gaps in reporting	56	44	53	60	26	107
Total “traditional” turnover	590	820	1,190	1,490	1,200	1,880
<i>Memo: Turnover at April 2004 exchange rates<sup>2</sup></i>	650	840	1,120	1,590	1,380	1,880

<sup>1</sup> Adjusted for local and cross-border double-counting. <sup>2</sup> Non-US dollar legs of foreign currency transactions were converted from current US dollar amounts into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2004 exchange rates. Table B.1

<sup>7</sup> See footnote 4.

<sup>8</sup> Market participants expected a sharp rise in trading volumes, mostly driven by the greater activity of the leveraged investor community. See G Galati and M Melvin, “Why has global FX turnover surged? Explaining the 2004 triennial survey”, *BIS Quarterly Review*, December 2004 ([http://www.bis.org/publ/qtrpdf/r\\_qt0412f.pdf](http://www.bis.org/publ/qtrpdf/r_qt0412f.pdf)).

context of a global search for yield, so-called “real money managers” and leveraged investors became increasingly interested in foreign exchange as an asset class alternative to equity and fixed income.<sup>9</sup> These factors dominated other forces that contributed to the decline in trading activity between 1998 and 2001 – consolidation in the banking sector, the growth of electronic broking and international concentration in the corporate sector – which continue to have an impact today.<sup>10</sup>

## 2. Market segments

Turnover rose across instruments but particularly in the spot market (from \$387 billion to \$621 billion) and forward markets (from \$131 billion to \$208 billion) (Table B.1). Trading volumes in foreign exchange swaps<sup>11</sup> increased from \$656 billion to \$944 billion. The faster growth in spot and forward markets relative to swaps seems at least in part to reflect the popularity of investment strategies based on momentum trading and carry trades, as well as higher hedging activity. It marks a break in the trend towards a reduction in the share of spot turnover and a rise in the share of swaps in overall foreign exchange market turnover that had been evident since 1992 (Graph B.1).

Turnover rose particularly in spot and forward markets

Reported foreign exchange market turnover by counterparty <sup>1</sup>				
As a percentage of global turnover				
	1995	1998	2001	2004
With reporting dealers	64	64	59	53
With other financial institutions	20	20	28	33
With non-financial customers	16	17	13	14
Local	46	46	43	38
Cross-border	54	54	57	62

<sup>1</sup> Adjusted for local and cross-border double-counting. Excludes estimated gaps in reporting. Table B.2

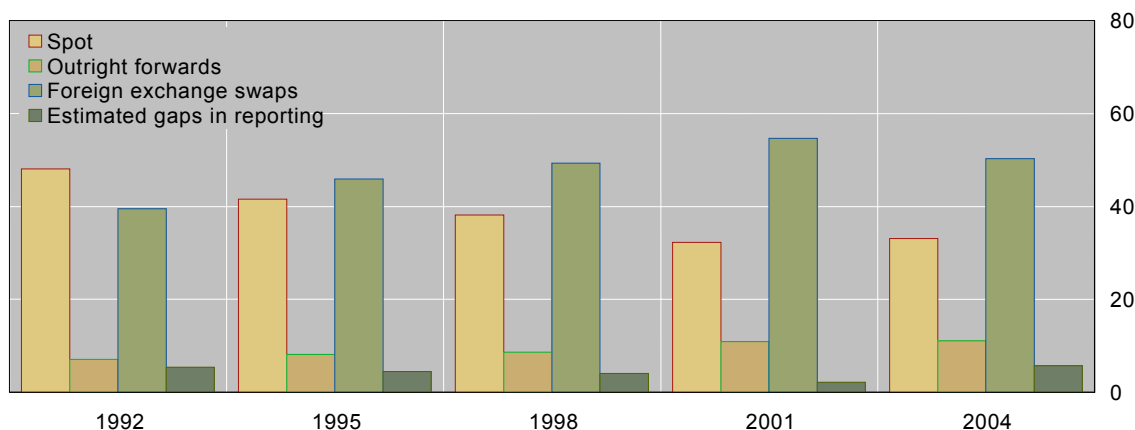
<sup>9</sup> “Real money managers” are market players – such as pension funds, insurance companies and corporate treasurers – who invest their own funds. This distinguishes them from leveraged investors – such as hedge funds or commodity trading advisers (CTAs) – that borrow substantial amounts of money.

<sup>10</sup> For an analysis of long-term factors that have tended to reduce trading volumes, see G Galati, “Why has global FX turnover declined? Explaining the 2001 triennial survey”, BIS Quarterly Review, December 2001.

<sup>11</sup> Foreign exchange swaps commit two counterparties to the exchange of two cash flows and involve the sale of one currency for another in the spot market with the simultaneous repurchase of the first currency in the forward market. By contrast, currency swaps (or cross-currency swaps), which are discussed in the next section on OTC derivatives markets, commit two counterparties to several cash flows, which in most cases involve an initial exchange of principal and a final re-exchange of principal upon maturity of the contract, and in all cases several streams of interest payments. See the instrument definitions and categorisation in Section D.6 below.

## Foreign exchange market turnover at constant April 2004 exchange rates by market segment<sup>1</sup>

As a percentage of total reported turnover



<sup>1</sup> Non-US dollar legs of foreign currency transactions were converted into original currency amounts at the average exchange rate for April of each survey year and then reconverted into US dollar amounts at average April 2004 exchange rates.

Graph B.1

### 3. Types of counterparty

The April 2004 figures also highlight some ongoing trends in the relative importance of trading between different counterparties.

Trading between banks and financial customers surged

Trading between banks and other financial institutions rose by an impressive 78% between 2001 and 2004, and its share in total turnover went up from 28% to 33% (Table B.2). Market commentary suggests that the higher activity between reporting banks and other financial institutions reflected trading by a large range of investors, including institutional investors (such as pension funds and insurance companies), hedge funds, commodity trading advisers (CTAs), proprietary trading desks of large commercial banks and currency overlay managers (COMs). This is in contrast with the period between 1998 and 2001, when activity in this market segment had been driven mainly by institutional investors, while the role of hedge funds had reportedly declined.

The surge of activity between banks and financial customers was arguably a manifestation of the broad search for yield that has characterised financial markets in recent years (Galati and Melvin (2004)). In this environment, financial customers followed two key strategies – carry trades and momentum trading – that targeted the same currencies. Extended periods of exchange rate appreciation by higher-yielding currencies in the 2001–04 period attracted investors playing both types of strategies.

In contrast to the previous survey results, trading between banks and non-financial customers also increased in 2004, and its share edged up slightly to 14%. In part this development might have been driven by corporate treasurers following investment strategies common among financial investors.

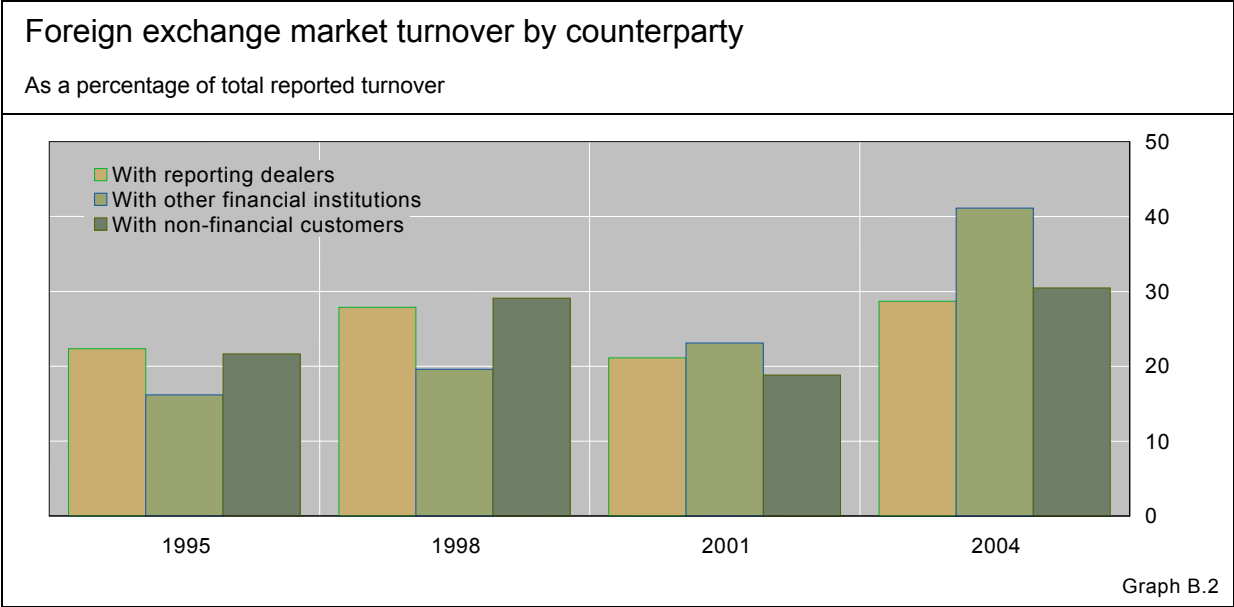
The share of interbank trading continued to fall

While trading between reporting dealers rose, its share in total foreign exchange turnover continued to fall. In 1995, nearly two thirds of all foreign exchange transactions were carried out between reporting banks. By 2004,

only about every second trade took place in the interbank market (Table B.2). This can in part be explained by two factors: the growing concentration in the banking industry and the consequent reduction in foreign exchange trading desks, and the important role that electronic brokers have taken on in the spot interbank market.

Bank mergers have led to a reduction in the number of market participants. Consolidation in the banking sector, which started in the mid-1990s and appears to have continued into 2004, has brought about a reduction in the number of trading desks and weighed on turnover, in particular in the interbank market. The consolidation trend in the banking industry is evident from the broad decline in the number of banks accounting for 75% of local turnover since 1995 (Table B.4).<sup>12</sup> In the United States, 75% of foreign exchange market transactions were conducted by only 11 banks in 2004 compared to 13 banks in 2001, and to 20 banks in 1998 and 1995. In the United Kingdom, 16 banks captured 75% of the market in 2004 compared to 17 banks in 2001, 24 banks in 1998 and about 20 banks in 1995.<sup>13</sup>

Further consolidation in the banking sector



<sup>12</sup> See also Table B.7. Due to a higher reporting threshold, the consolidation in the banking industry cannot be gauged by changes in the number of reporting banks for the countries that participated in the previous surveys. A detailed description of this methodological change can be found in Section D.

<sup>13</sup> In comparing statistics on reporting banks, it is important to highlight that the reporters covered by the turnover part of the triennial survey are individual offices of trading firms rather than banking organisations on a consolidated basis. This implies that statistics on global concentration of foreign exchange business in the banking sector, eg the number of banking organisations accounting for 75% of global trading, cannot be calculated.

## Currency distribution of reported foreign exchange market turnover<sup>1</sup>

Percentage shares of average daily turnover in April

	1992	1995	1998	2001	2004
US dollar	82.0	83.3	87.3	90.3	88.7
Euro	.	.	.	37.6	37.2
Deutsche mark <sup>2</sup>	39.6	36.1	30.1	.	.
French franc	3.8	7.9	5.1	.	.
ECU and other EMS currencies	11.8	15.7	17.3	.	.
Japanese yen	23.4	24.1	20.2	22.7	20.3
Pound sterling	13.6	9.4	11.0	13.2	16.9
Swiss franc	8.4	7.3	7.1	6.1	6.1
Australian dollar	2.5	2.7	3.1	4.2	5.5
Canadian dollar	3.3	3.4	3.6	4.5	4.2
Swedish krona <sup>3</sup>	1.3	0.6	0.4	2.6	2.3
Hong Kong dollar <sup>3</sup>	1.1	0.9	1.3	2.3	1.9
Norwegian krone <sup>3</sup>	0.3	0.2	0.4	1.5	1.4
Korean won <sup>3</sup>	...	...	0.2	0.8	1.2
Mexican peso <sup>3</sup>	...	...	0.6	0.9	1.1
New Zealand dollar <sup>3</sup>	0.2	0.2	0.3	0.6	1.0
Singapore dollar <sup>3</sup>	0.3	0.3	1.2	1.1	1.0
Danish krone <sup>3</sup>	0.5	0.6	0.4	1.2	0.9
South African rand <sup>3</sup>	0.3	0.2	0.5	1.0	0.8
Russian rouble <sup>3</sup>	...	...	0.3	0.4	0.7
Polish zloty <sup>3</sup>	...	...	0.1	0.5	0.4
Taiwan dollar <sup>3</sup>	...	...	0.1	0.3	0.4
Indian rupee <sup>3</sup>	...	...	0.1	0.2	0.3
Brazilian real <sup>3</sup>	...	...	0.4	0.4	0.2
Czech koruna <sup>3</sup>	...	...	0.3	0.2	0.2
Thai baht <sup>2</sup>	...	...	0.2	0.2	0.2
Hungarian forint <sup>3</sup>	...	...	0.0	0.0	0.2
Chilean peso <sup>3</sup>	...	...	0.1	0.2	0.1
Malaysian ringgit <sup>3</sup>	...	...	0.0	0.1	0.1
Other currencies	7.7	7.1	8.2	6.5	6.1
All currencies	200	200	200	200	200

<sup>1</sup> Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%. The figures relate to reported "net-net" turnover, ie they are adjusted for both local and cross-border double-counting. <sup>2</sup> Data for April 1998 exclude domestic trading involving the Deutsche mark in Germany. <sup>3</sup> For 1992-98, the data cover home currency trading only.

Table B.3

Reported foreign exchange market turnover by currency pair <sup>1</sup>								
Daily averages in April, in billions of US dollars and per cent								
	1995		1998		2001		2004	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
US dollar/euro	.	.	.	.	354	30	501	28
US dollar/mark	254	22	291	20	.	.	.	.
US dollar/French franc	51	4	58	4	.	.	.	.
US dollar/ECU	18	2	17	1	.	.	.	.
US dollar/other EMS	104	9	176	12	.	.	.	.
US dollar/yen	242	21	257	18	231	20	296	17
US dollar/sterling	78	7	118	8	125	11	245	14
US dollar/Swiss franc	61	5	79	5	57	5	78	4
US/Canadian dollar	38	3	50	3	50	4	71	4
US/Australian dollar	29	3	42	3	47	4	90	5
US dollar/other	72	6	172	12	195	17	292	16
Euro/yen	.	.	.	.	30	3	51	3
Euro/sterling	.	.	.	.	24	2	43	2
Euro/Swiss franc	.	.	.	.	12	1	26	1
Euro/other	.	.	.	.	21	2	39	2
Mark/yen	24	2	24	2	.	.	.	.
Mark/sterling	21	2	31	2	.	.	.	.
Mark/Swiss franc	18	2	18	1	.	.	.	.
Mark/French franc	34	3	10	1	.	.	.	.
Mark/ECU	6	1	3	0	.	.	.	.
Mark/other EMS	38	3	35	2	.	.	.	.
Mark/other	16	1	18	1	.	.	.	.
Other EMS/other EMS <sup>2</sup>	3	0	5	0	.	.	.	.
Other currency pairs	30	3	31	2	26	2	42	2
All currency pairs	1,137	100	1,430	100	1,173	100	1,773	100

<sup>1</sup> Adjusted for local and cross-border double-counting. <sup>2</sup> The data cover home currency trading only.  
Table B.4

#### 4. Currency composition

Between 2001 and 2004, there were no substantial changes in the currency composition of turnover. The dollar continued to be the most traded currency, being on one side of 89% of all transactions, compared to 90% in 2001 (Table B.3). The euro's share remained at around 37%, while that of the yen edged down from 23% to 20%. Two currencies that gained some market share, the pound sterling (from 13% to 17%) and the Australian dollar (from 4.2% to 5.5%), possibly benefited from their important role as an investment vehicle and valuation effects. The share of trading in local currencies in emerging markets increased slightly from 4.5% to 5.2%.<sup>14</sup>

No important changes in the currency composition ...

<sup>14</sup> For an analysis of trading in Asian currencies, see C Ho, G Ma and R N McCauley, "Trading Asian currencies", *BIS Quarterly Review*, March 2005 ([http://www.bis.org/publ/qtrpdf/r\\_qt0503e.htm](http://www.bis.org/publ/qtrpdf/r_qt0503e.htm)).

Dollar/euro continued to be by far the most traded currency pair in April 2004, capturing 28% of global turnover, slightly less than in 2001, followed by dollar/yen with 17% (20% in 2001) (Table B.5). Turnover in dollar/sterling and euro/sterling nearly doubled, reaching 14% and 2%, respectively. While trading activity grew at a much higher rate in the euro/yen than in the dollar/yen market, the former still accounts for no more than 3% of total turnover. The dollar remained the dominant currency in foreign exchange markets in most emerging market countries, including the biggest trading centres in eastern Europe (Annex Table E.4).

## 5. Geographical distribution

... and geographical distribution of trading

The geographical distribution of foreign exchange trading remained stable since the last survey, as turnover rose in most countries, with only a few exceptions (Table B.6).<sup>15</sup> There were no changes in the ranking of major trading centres.<sup>16</sup> The only noteworthy change in market share appears to be that of the United States, which captured 19% of the global market compared to 16% in 2001.

Concentration in the banking industry				
Number of banks accounting for 75% of turnover				
	1995	1998	2001	2004
United Kingdom	20 <sup>1</sup>	24	17	16
United States	20	20	13	11
Japan	24	19	17	11
Singapore	25	23	18	11
Germany	10	9	5	4
Switzerland	5	7	6	5
Hong Kong SAR	13–22 <sup>3</sup>	26	14	11
Australia	10 <sup>2</sup>	9	10	8
France	7–12 <sup>3</sup>	7	6	6
Canada	6–7 <sup>3</sup>	5–7 <sup>3</sup>	4–6 <sup>3</sup>	4

<sup>1</sup> 68%. <sup>2</sup> 70%. <sup>3</sup> Depending on the market segment.

Table B.5

<sup>15</sup> The reference here is also to individual banking offices rather than banking organisations. Given the change in criterion for assigning trades to trading centres from location of trading to location of sales (see footnote 5), comparisons of the geographical distribution between 2001 and 2004 have to be done with caution. Some of the minor changes in market share might in fact be due to this methodological change.

<sup>16</sup> In interpreting the geographical composition of turnover, an important caveat is that the criterion for identifying the location of a trade has changed from where the trade is executed to the location of the sales desk where the trade was initiated. The relative size of financial centres might not be robust to this methodological change.

## Geographical distribution of reported foreign exchange market turnover<sup>1</sup>

Daily averages in April, in billions of US dollars and per cent

	1992		1995		1998		2001		2004	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Argentina	...	...	...	...	2	0.1	...	...	1	0
Australia	29	2.7	40	2.5	47	2.4	52	3.2	81	3.4
Austria	4	0.4	13	0.8	11	0.6	8	0.5	13	0.6
Bahrain	4	0.4	3	0.2	2	0.1	3	0.2	3	0.1
Belgium	16	1.5	28	1.8	27	1.4	10	0.6	20	0.8
Brazil <sup>2</sup>	...	...	...	...	5	0.3	5	0.3	3	0.1
Canada	22	2	30	1.9	37	1.9	42	2.6	54	2.2
Chile	...	...	...	...	1	0.1	2	0.1	2	0.1
China <sup>3</sup>	...	...	...	...	0	0	0	0	1	0
Colombia	...	...	...	...	...	...	0	0	1	0
Czech Republic	...	...	...	...	5	0.3	2	0.1	2	0.1
Denmark	27	2.5	31	2	27	1.4	23	1.4	41	1.7
Estonia	...	...	...	...	...	...	...	...	0	0
Finland <sup>4</sup>	7	0.7	5	0.3	4	0.2	2	0.1	2	0.1
France	33	3.1	58	3.7	72	3.7	48	3	63	2.6
Germany	55	5.1	76	4.8	94	4.8	88	5.5	118	4.9
Greece	1	0.1	3	0.2	7	0.4	5	0.3	4	0.2
Hong Kong SAR	60	5.6	90	5.7	79	4	67	4.1	102	4.2
Hungary	...	...	...	...	1	0.1	1	0	3	0.1
India	...	...	...	...	2	0.1	3	0.2	7	0.3
Indonesia	...	...	...	...	2	0.1	4	0.2	2	0.1
Ireland	6	0.6	5	0.3	10	0.5	8	0.5	7	0.3
Israel	...	...	...	...	...	...	1	0.1	5	0.2
Italy	16	1.5	23	1.5	28	1.4	17	1	20	0.8
Japan	120	11.2	161	10.2	136	6.9	147	9.1	199	8.3
Korea	...	...	...	...	4	0.2	10	0.6	20	0.8
Latvia	...	...	...	...	...	...	...	...	2	0.1
Lithuania	...	...	...	...	...	...	...	...	1	0
Luxembourg	13	1.2	19	1.2	22	1.1	13	0.8	14	0.6
Malaysia	...	...	...	...	1	0.1	1	0.1	2	0.1
Mexico	...	...	...	...	9	0.5	9	0.5	15	0.6
Netherlands	20	1.9	26	1.7	41	2.1	30	1.9	49	2
New Zealand	4	0.4	7	0.4	7	0.4	4	0.2	7	0.3
Norway	5	0.5	8	0.5	9	0.5	13	0.8	14	0.6
Peru	...	0	...	0	...	...	0	0	0	0
Philippines	...	...	...	...	1	0.1	1	0.1	1	0
Poland	...	...	...	...	3	0.2	5	0.3	6	0.3
Portugal	1	0.1	2	0.1	4	0.2	2	0.1	2	0.1
Russia	...	...	...	...	7	0.4	10	0.6	30	1.2
Saudi Arabia	...	...	...	...	2	0.1	2	0.1	2	0.1
Singapore	74	6.9	105	6.7	139	7.1	101	6.2	125	5.2
Slovakia	...	...	...	...	...	...	1	0	2	0.1
Slovenia	...	...	...	...	...	...	0	0	0	0
South Africa	3	0.3	5	0.3	9	0.5	10	0.6	10	0.4
Spain	12	1.1	18	1.1	19	1	8	0.5	14	0.6
Sweden	21	2	20	1.3	15	0.8	24	1.5	31	1.3
Switzerland	66	6.1	87	5.5	82	4.2	71	4.4	79	3.3
Taiwan, China	...	...	...	...	5	0.3	4	0.3	8	0.3
Thailand	...	...	...	...	3	0.2	2	0.1	3	0.1
Turkey	...	...	...	...	...	...	1	0.1	3	0.1
United Kingdom	291	27	464	29.5	637	32.5	504	31.2	753	31.3
United States	167	15.5	244	15.5	351	17.9	254	15.7	461	19.2
Total	1,076	100	1,572	100	1,958	100	1,612	100	2,406	100

<sup>1</sup> Adjusted for local double-counting ("net-gross"). <sup>2</sup> Data for 1998 cover spot transactions only. <sup>3</sup> Spot transactions only. <sup>4</sup> Data for 1992 not adjusted for local double-counting.

Table B.6

## Basic features of the April 2004 foreign exchange market survey

	Coverage in per cent	Number of banks covering 75%	Number of participants <sup>1</sup>	Number of trading days	Nature of turnover	
					in April	preceding six months
Argentina	100%	18	148	19	below normal	increasing
Australia	95%	8	42	17	normal	steady
Austria	98%	4	13	21	normal	steady
Bahrain	85%	3	18	21	normal	steady
Belgium	>90%	4	4	20	normal	steady-inc <sup>1</sup>
Brazil	72%	6	17	20	normal	steady-inc <sup>1</sup>
Canada	99%	4	18	21	normal	steady-inc <sup>1</sup>
Chile	82%	8	11	21	normal	steady
China	...	...	...	22	...	...
Colombia	67%	6	16	20	normal	steady
Czech Republic	95%	6	15	21	below normal	steady-dec <sup>1</sup>
Denmark	90%	2	7	19	above normal	steady
Estonia	100%	2	6	21	normal	steady
Finland	100%	3	9	20	normal	steady
France	95%	6	35	21	normal	steady-inc <sup>1</sup>
Germany	85%	4	20	20	normal	steady
Greece	85%	4	7	20	below normal	steady
Hong Kong SAR	≈95%	11	58	19	normal	steady
Hungary	90–95%	6-7	14	21	normal	steady
India	79%	11	20	20	normal	steady
Indonesia	75%	9	17	21	normal	steady
Ireland	75%	2	19	21	normal	steady-inc <sup>1</sup>
Israel	100%	5	12	19	above normal	increasing
Italy	92%	10	46	21	normal	steady
Japan	92%	11	88	21	above normal	increasing
Korea	99%	12	43	20	normal	increasing
Latvia	90%	2	7	20	normal	increasing
Lithuania	99%	2	7	21	normal	steady
Luxembourg	95%	11	35	21	below normal	steady
Malaysia	75%	9	9	24	normal	steady
Mexico	90%	6	10	20	below normal	steady
Netherlands	90–95%	8	8	20	normal	steady-inc <sup>1</sup>
New Zealand	90%	3	5	20	normal	steady-dec <sup>1</sup>
Norway	...	2	9	19	below normal	steady
Peru	85–99%	6	11	20	below normal	steady
Philippines	100%	7	15	19	above normal	steady-inc <sup>1</sup>
Poland	95%	7	16	21	normal	steady
Portugal	97%	5	16	21	normal	steady
Russia	90%	18	40	22	normal	steady
Saudi Arabia	90%	6	11	25	normal	decreasing
Singapore	99%	11	52	21	normal	steady-inc <sup>1</sup>
Slovakia	100%	5	194	20	normal	increasing
Slovenia	70–80%	7	7	20	normal	steady
South Africa	>95%	5	12	18	normal	steady
Spain	79%	2	9	20	normal	steady
Sweden	90%	3	4	20	normal	steady-dec <sup>2</sup>
Switzerland	96%	5	22	20	normal	steady
Taiwan, China	93%	15	32	22	above normal	increasing
Thailand	100%	24	32	18	normal	steady
Turkey	98%	6	21	21	normal	steady
United Kingdom	99%	16	93	20	normal	steady-inc <sup>1</sup>
United States	>90%	11	42	21	normal	increasing

<sup>1</sup> Increasing. <sup>2</sup> Decreasing.

Table B.7

## C. Derivatives market activity

In April 2004 the BIS collected OTC derivatives market data concerning turnover in currency and interest rate products through 52 reporting central banks and monetary authorities. In June that year data were collected regarding notional amounts outstanding of OTC derivatives from market participants in 44 countries and jurisdictions worldwide.

As in the previous years, there are major differences between the two surveys. Turnover data, which are reported in Tables C.1 to C.4, refer only to the two main segments of the derivatives market, ie interest rate and currency products; the amounts outstanding, in Tables C.5 to C.8, refer also to the smaller, yet rapidly expanding markets for credit- and equity-related products as well as commodities. In addition, turnover data are collected on a locational basis, while amounts outstanding are collected on a consolidated basis.

Major differences  
between surveys

Turnover data are provided by approximately 1,200 market participants in the 52 surveyed countries and are expressed on a gross and unconsolidated basis, which permits a comparison of activity between various marketplaces. Compared to previous surveys, the most recent survey refines and clarifies the reporting procedure, especially concerning the dealer concept and the reporting basis for the location of trades. Notwithstanding these changes, data from the most recent survey are expected to be highly comparable to those of the previous surveys.

As mentioned above, notional amounts outstanding are reported on a consolidated basis. The format of these data is the same as the regular semiannual BIS surveys of positions in the global OTC derivatives market.<sup>17</sup> However, while the semiannual survey relies on data provided by major dealers in the G10 countries, the triennial survey covers market participants in 44 countries and jurisdictions. In addition to higher coverage in terms of market participants, the triennial survey offers a wider picture of notional amounts and gross market values also in terms of risk categories, insofar as it also includes information about credit derivatives,<sup>18</sup> a segment of the OTC market which has been expanding at an exceptional pace.

Notional data  
reported on  
consolidated basis

The survey shows that growth was robust in both main segments, ie interest rate and currency products, unlike what was observed in the previous three-year survey, when growth in interest rate products was accompanied by a fall in activity in currency derivatives. As recorded in the last survey, there was pronounced growth in credit derivatives, whose notional amounts rose to the same level as those of equity-related derivatives.

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<sup>17</sup> Once the total size of the market has been determined through the triennial survey, the figures in the semiannual surveys are grossed up to produce estimates of total market size for the intervening semiannual periods between two triennial surveys.

<sup>18</sup> The BIS has been collecting semiannual CDS statistics since the end of 2004.

Global turnover in OTC derivatives markets									
Daily averages, in billions of US dollars									
	Total			Foreign exchange <sup>1</sup>			Interest rate <sup>2</sup>		
	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004
Total reported gross turnover	1,988	2,168	3,509	1,573	1,356	1,989	415	812	1,519
Adjustment for local double-counting <sup>3</sup>	-306	-306	-420	-235	-170	-231	-71	-136	-188
Total reported turnover net of local double-counting ("net-gross")	1,682	1,862	3,089	1,338	1,186	1,758	344	676	1,331
Adjustment for cross-border double-counting <sup>3</sup>	-458	-520	-772	-379	-333	-466	-79	-187	-306
Total reported net-net turnover	1,224	1,342	2,317	959	853	1,292	265	489	1,025
with reporting dealers	763	826	1,191	614	503	696	150	323	494
local	306	305	419	235	170	231	71	135	188
cross-border	457	520	771	379	333	465	78	187	306
with other financial institutions	267	376	871	178	235	421	89	142	450
local	125	161	352	79	105	157	46	57	195
cross-border	142	215	520	99	130	264	44	85	256
with non-financial customers	193	140	248	166	115	169	27	25	79
local	125	89	133	108	75	102	16	15	31
cross-border	68	50	114	58	40	67	10	10	47
Estimated gaps in reporting <sup>4</sup>	39	43	93	29	22	53	10	23	40
Estimated global turnover	1,265	1,385	2,410	990	875	1,345	275	512	1,065
<i>Memo:</i>									
<i>Turnover at April 2004 exchange rates</i>	1,350	1,600	2,410	...	...	...	...	...	...
<i>Exchange-traded products<sup>5</sup></i>	1,382	2,180	4,657	11	10	23	1,371	2,170	4,634

<sup>1</sup> Including outright forwards and foreign exchange swaps. <sup>2</sup> Single currency contracts only. <sup>3</sup> Made by halving positions vis-à-vis other local reporting dealers and other reporting dealers abroad respectively. <sup>4</sup> Based on reported coverage. <sup>5</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges.

Table C.1

## 1. Turnover data

### 1.1 Global daily turnover in OTC derivatives markets

Buoyant growth in OTC derivatives

Between April 2001 and April 2004 average daily turnover in OTC derivatives markets (adjusted for double-counting in local and cross-border transactions) increased by 73%, to \$2,317 billion (Table C.1). Business returned to buoyant growth after expanding by just over 10% in 2001 (down from 44% in 1998). Currency turnover, which had contracted in 2001, returned to vigorous growth, as investment in currency products became an alternative to equity and fixed income instruments. Trading in interest rate products more than doubled. Strong business in interest rate derivatives derived from changes in both hedging and trading practices in the swap market; it was also a consequence of events which noticeably increased hedging-related demand.

Global OTC derivatives market turnover <sup>1</sup>				
Daily averages in April, in billions of US dollars				
	1995	1998	2001	2004
Foreign exchange turnover	688	959	853	1,292
Outright forwards and foreign exchange swaps	643	862	786	1,152
Currency swaps	4	10	7	21
Options	41	87	60	117
Other	1	0	0	2
Interest rate turnover	151	265	489	1,025
FRAs	66	74	129	233
Swaps	63	155	331	621
Options	21	36	29	171
Other	2	0	0	0
Total derivatives turnover <sup>2</sup>	880	1,265	1,385	2,410
<i>Memo:</i>				
Turnover at April 2004 exchange rates	825	1,350	1,600	2,410
Exchange-traded derivatives <sup>3</sup>	1,221	1,382	2,180	4,657
Currency contracts	17	11	10	23
Interest rate contracts	1,204	1,371	2,170	4,634

<sup>1</sup> Adjusted for local and cross-border double-counting. <sup>2</sup> Including estimates for gaps in reporting. <sup>3</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Reported monthly data were converted into daily averages on the assumption of 18.5 trading days in 1995, 20.5 days in 1998, 19.5 days in 2001 and 20 days in 2004. Table C.2

## 1.2 Market segments and currency composition

Between April 2001 and April 2004 turnover of foreign exchange products grew by 51% to \$1,292 billion, while business in interest rate derivatives was up by 110%, to \$1,025 billion. Activity in currency products returned to the growth rates typical of the 1990s after slowing down in 2001, while business in interest rate derivatives expanded at even higher rates, after the already high growth of 85% and 75% displayed in the previous two surveys.

Strong activity in the foreign exchange segment was typical of all instruments. Turnover in outright forwards and foreign exchange swaps rose by 47%, to \$1,152 billion, after dropping by 9% in the previous survey. Options turnover, which had previously fallen by 31%, grew by 95%, to \$117 trillion. The increase was particularly large for currency swaps, up by 200%, although the size of this market remains rather small, close to \$21 billion in April 2004. The higher turnover in currency products is only partly due to valuation effects deriving from the significant depreciation of the US dollar since 2001, suggesting that agents may increasingly be seeking to invest in currencies as an alternative to equities and interest rate products.

Foreign exchange turnover returns to expansion

Contracts involving the dollar continued to account for the vast majority of turnover in OTC foreign exchange markets, as the dollar segment of turnover rose by 47%, to \$1,154 billion (Table C.3). The turnover of dollar contracts involving the euro, which had dropped by 34% in the last three-year survey, returned to growth, expanding by 35% to \$345 billion. Dollar contracts involving the yen rose by 31% and those involving the pound sterling by 93%.

## Reported turnover in OTC derivatives markets by currency pair<sup>1</sup>

Daily averages in billions of US dollars

Foreign exchange contracts									
	Total			of which					
				Outright forwards			Forex swaps		
	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004
US dollar with other currencies	880	787	1,154	103	111	170	698	623	874
Euro	...	256	345	...	40	58	...	199	247
Deutsche mark	165	...	...	22	...	...	124	...	...
Japanese yen	181	169	222	26	26	33	118	125	159
Pound sterling	84	101	195	10	11	22	69	86	161
Other EMS currencies	223	...	...	18	...	...	197	...	...
Other	227	260	392	27	34	57	190	213	307
Euro with other currencies <sup>2</sup>	...	47	104	...	15	30	...	22	51
Japanese yen	...	18	38	...	6	12	...	6	15
Pound sterling	...	14	29	...	4	7	...	8	18
Other	...	15	37	...	5	11	...	8	18
Deutsche mark with other currencies <sup>2</sup>	53	...	...	14	...	...	22	...	...
Japanese yen	11	...	...	3	...	...	2	...	...
Pound sterling	11	...	...	3	...	...	3	...	...
Other EMS currencies	14	...	...	5	...	...	7	...	...
Other	16	...	...	3	...	...	10	...	...
Japanese yen with other currencies <sup>3</sup>	6	3	10	3	2	3	2	1	7
Other currency pairs	20	15	24	6	4	5	11	9	12
All currency pairs	959	853	1,292	128	131	208	734	656	944
<i>Memo:</i>									
<i>Exchange-traded currency contracts<sup>5</sup></i>	11	10	23	...	...	...	...	...	...
Interest rate contracts <sup>4</sup>									
	Total			of which					
				FRAs			Swaps		
	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004
US dollar	71	152	347	23	39	59	36	100	195
Euro	...	231	461	...	48	116	...	173	288
Deutsche mark	63	...	...	9	...	...	47	...	...
Japanese yen	27	27	46	3	9	0	14	16	35
Pound sterling	17	37	90	8	12	25	8	23	59
Other EMS currencies	59	...	...	17	...	...	38	...	...
Other	28	42	81	14	21	33	12	19	44
Total turnover	265	489	1,025	74	129	233	155	331	621
<i>Memo:</i>									
<i>Exchange-traded interest rate contracts<sup>5</sup></i>	1,371	2,170	4,634	...	...	...	...	...	...

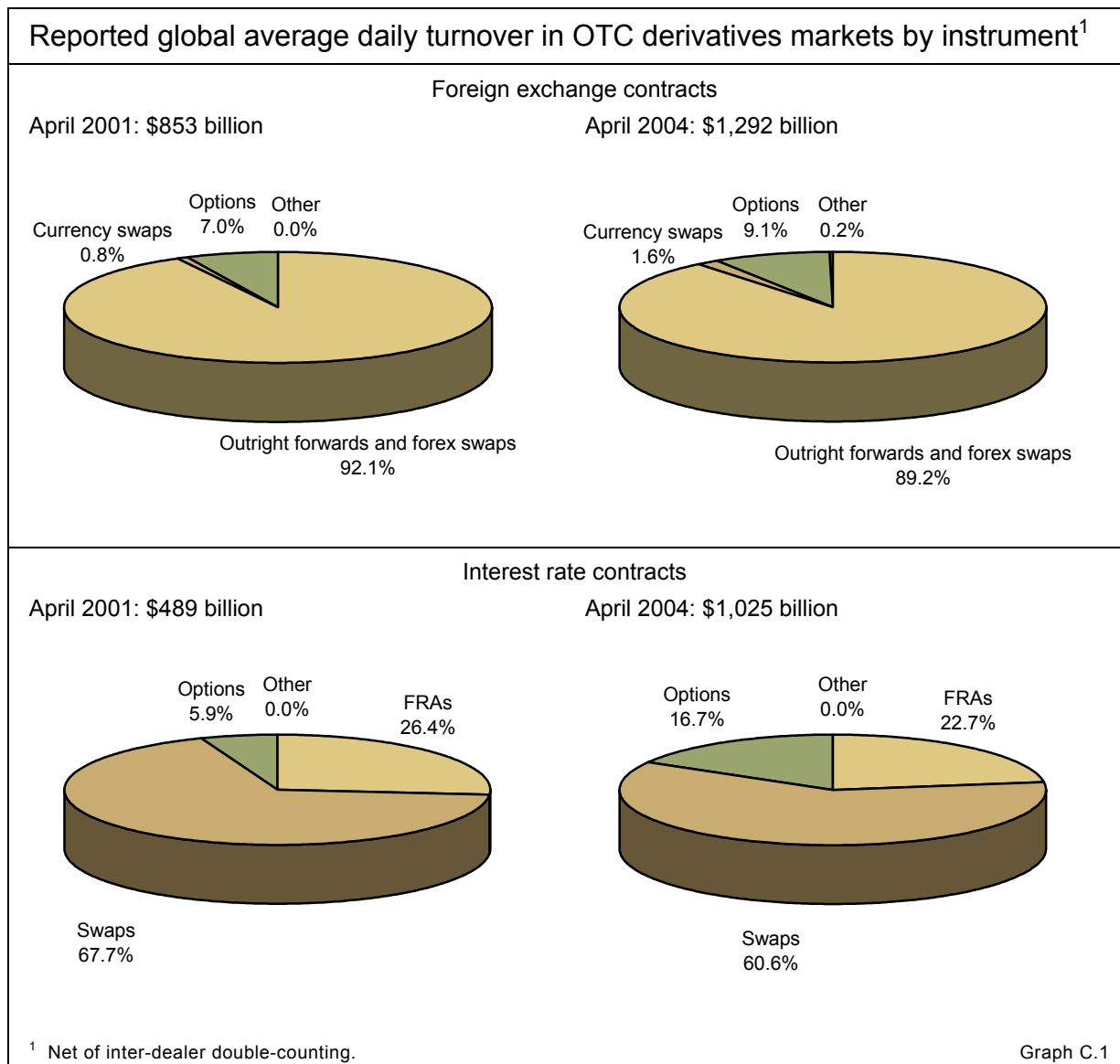
<sup>1</sup> Adjusted for local and cross-border double-counting. <sup>2</sup> Excluding the US dollar. <sup>3</sup> Excluding the US dollar and the Deutsche mark and euro respectively. <sup>4</sup> Single currency contracts only. <sup>5</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Reported monthly data were converted into daily averages on the assumption of 18.5 trading days in 1995, 20.5 days in 1998, 19.5 days in 2001 and 20 days in 2004. Table C.3

The interest rate segment also expanded across all instruments. Daily turnover of swaps grew by 88%, to \$621 billion, accounting for nearly 61% of

the overall turnover of this segment. Activity rose by 81% for forward rate agreements (FRAs), to \$233 billion, and by 490% for options, to \$171 billion. Economic agents appear to be seeking alternative hedging instruments; the share of options in overall trading in the interest rate segment jumped from 6% to 17%. The relatively high interest rate volatility after the terrorist attacks of September 2001 probably contributed to increased demand for interest rate products over the period.

Interest rate derivatives denominated in US dollars amounted to \$347 billion while those concerning the euro were \$461 billion. Growth in the swap market was strong both for the US dollar and the euro segment, up by 95% and 66%, to \$195 billion and \$288 billion, respectively. The euro segment was also strong for FRAs, where business rose by 142%, to \$116 billion, nearly three times the pace of dollar segment growth. Transactions in yen and pound sterling segments were quite active for swaps, up by 119% and 157%, respectively, to \$35 and \$59 billion. The combined share of the yen and the pound in total interest rate swap activity rose from 12% in April 2001 to 15% in April 2004.

Both dollar and euro swap markets record robust growth



## Geographical distribution of reported OTC derivatives market activity<sup>1</sup>

Average daily turnover, in billions of US dollars

	Total			Foreign exchange <sup>2</sup>			Interest rate <sup>3</sup>		
	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004	April 1998	April 2001	April 2004
Argentina			...			...			...
Australia	32	51	73	29	41	60	3	10	13
Austria	10	8	23	6	4	9	3	4	14
Bahrain	1	2	1	1	2	1	0	0	0
Belgium	25	22	45	20	8	14	5	14	31
Brazil	...	2	2	...	2	1	...	0	1
Canada	34	43	53	27	33	41	6	10	12
Chile	1	1	1	1	1	1	0	0	0
China	...	...	...	...	...	...	...	...	...
Colombia	...	0	0	...	0	0	...	0	...
Czech Republic	3	1	2	3	1	1	0	0	1
Denmark	26	25	44	22	20	33	4	6	11
Estonia			0			0			...
Finland	5	2	1	3	1	1	2	1	0
France	99	106	205	58	41	54	41	65	151
Germany	87	159	127	58	65	85	29	94	43
Greece	4	3	3	4	3	3	0	0	0
Hong Kong SAR	51	52	82	49	49	70	2	3	11
Hungary	1	0	2	1	0	2	0	0	0
India	1	2	4	1	2	3	0	0	1
Indonesia	1	1	1	1	1	1	0	0	0
Ireland	7	11	15	6	5	3	2	6	12
Israel	...	0	2	...	0	2	...	0	...
Italy	21	36	53	17	12	15	4	24	38
Japan <sup>4</sup>	121	132	185	89	116	154	32	16	31
Korea	1	4	11	1	4	10	0	0	1
Latvia			1			1			...
Lithuania			0			0			0
Luxembourg	17	13	19	15	9	11	2	5	7
Malaysia	1	1	1	1	1	1	0	0	0
Mexico	3	5	6	2	4	5	0	0	1
Netherlands	31	49	61	28	25	42	4	24	19
New Zealand	5	3	7	5	3	6	0	0	1
Norway	9	12	17	6	10	12	3	3	5
Peru	...	0	0	...	0	0	...	0	...
Philippines	0	1	0	0	1	0	0	0	0
Poland <sup>5</sup>	1	4	6	1	3	5	...	1	1
Portugal	4	1	2	3	1	1	1	0	1
Russia	1	0	6	1	0	6	0	0	...
Saudi Arabia	1	1	1	1	1	1	0	0	0
Singapore	91	73	100	85	69	91	5	3	9
Slovakia	...	1	1	...	1	1	...	0	...
Slovenia	...	0	0	...	0	0	...	0	...
South Africa	6	8	11	5	8	8	1	1	3
Spain	17	26	22	14	6	10	3	21	12
Sweden	15	22	32	11	19	25	4	3	7
Switzerland	63	63	74	57	53	62	6	10	12
Taiwan, China	2	2	6	2	2	5	0	0	2
Thailand	2	1	2	2	1	2	0	0	0
Turkey	...	1	2	...	1	2	...	0	0
United Kingdom	591	628	1,176	468	390	613	123	238	563
United States	294	285	599	235	169	281	58	116	317
Total "net-gross" turnover	1,682	1,862	3,089	1,339	1,186	1,758	343	676	1,331

<sup>1</sup> Adjusted for local double-counting ("net-gross"). <sup>2</sup> Including outright forwards and foreign exchange swaps. <sup>3</sup> Single currency contracts only. <sup>4</sup> Revised for 1998. <sup>5</sup> Revised for 2001.

Table C.4

Global positions in OTC derivatives markets						
Amounts outstanding, in billions of US dollars						
	Positions at end-June 2001			Positions at end-June 2004		
	Total	Foreign exchange	Interest rates <sup>1</sup>	Total	Foreign exchange	Interest rates <sup>1</sup>
Notional amounts						
Reported positions	144,283	27,706	112,132	314,918	43,974	256,457
Adjustment for double-counting <sup>2</sup>	-44,624	-7,271	-36,319	-94,848	-12,474	-79,000
Adjusted reported positions	99,659	20,435	75,813	220,070	31,500	177,457
<i>Memo:</i>						
<i>Total contracts at end-June 2004</i>						
<i>exchange rates</i>	119,200	...	...	220,070	...	...
<i>Exchange-traded positions</i> <sup>3</sup>	17,581	66	17,515	49,483	98	49,385
Gross market values						
Reported positions	4,224	1,269	2,536	8,788	1,473	6,445
Adjustment for double-counting <sup>2,4</sup>	-1,180	-302	-788	-2,397	-357	-1,863
Adjusted reported positions	3,042	967	1,748	6,391	1,116	4,582
<i>Memo:</i>						
<i>Total contracts at end-June 2004</i>						
<i>exchange rates</i>	3,580	...	...	6,391	...	...
<i>Gross credit exposure</i> <sup>5</sup>	1,019	...	...	1,478	...	...

<sup>1</sup> Single currency contracts only. <sup>2</sup> Made by halving positions vis-à-vis other reporting dealers. <sup>3</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. <sup>4</sup> Partly estimated. <sup>5</sup> Gross market values after taking into account legally enforceable bilateral netting agreements. Table C.5

### 1.3 Types of counterparty

Business expanded for all types of counterparty. Activity with non-reporting financial institutions was up the most, by 132% to \$871 billion (Table C.1). Turnover with non-financial customers also grew at an accelerated rate, by 77% to \$248 billion. Finally, turnover was up by 44% within the group of reporting dealers, to \$1,191 billion.

Among the counterparty groups, there were different patterns in the growth rates of turnover. The rate of growth of business with both non-reporting financial institutions and non-financial customers was much higher for interest rate products (117%) than for exchange rate-related products (69%). The same was true for activity with reporting dealers, which expanded by 38% for currency-related derivatives and 53% for interest rate derivatives.

Cross-border activity continued to grow faster than local activity, as in previous surveys. In aggregate, cross-border turnover expanded by 79%, to \$1,405 trillion, while local business grew by 63%, to \$904 billion. This trend was especially apparent in business with non-reporting financial institutions in foreign exchange products, where cross-border business grew by 103% while local business rose by 50%. Business with non-financial firms increased markedly at the cross-border level for interest rate derivatives, which were up by 370%.

Cross-border  
growth exceeds  
local

### 1.4 Geographical distribution

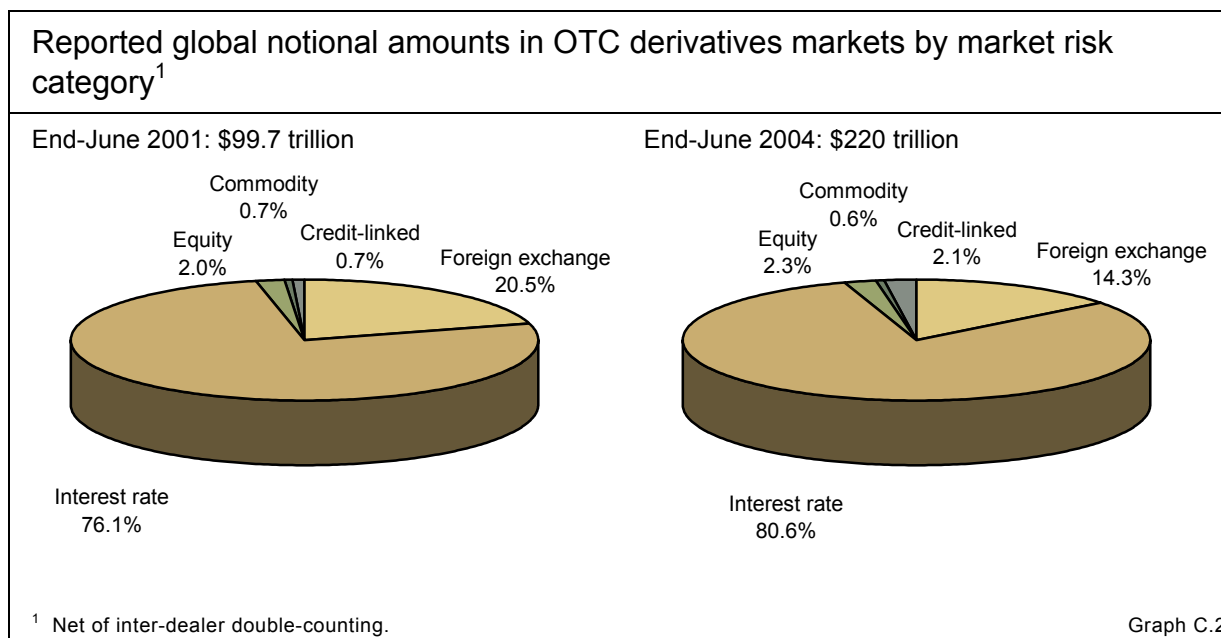
London and New York remain the top centres for activity

London remained the main centre for OTC derivatives trading. It expanded its share of overall trading to 38%, up 4 percentage points from the previous three-year survey. Business in this marketplace amounted to \$1.2 trillion dollars, up 87% from the previous survey (Table C.4). New York is the second largest marketplace, with a daily turnover of \$600 billion, up 110% from April 2001. Paris, Tokyo, Frankfurt, Singapore and Hong Kong are the other most important trading centres. In the last three years there has been a slight increase in the concentration of worldwide trading activity, with the top five marketplaces accounting for nearly 75% of overall business.<sup>19</sup>

## 2. Notional amounts outstanding

### 2.1 Global notional amounts in the OTC derivatives markets

In the three years to end-June 2004 the notional amounts<sup>20</sup> of outstanding OTC contracts rose by 120%, to \$220 trillion, after adjusting for double-counting among the reporting institutions (Table C.5). Similar to the turnover figures, notional amounts expanded more strongly in the interest rate segment, by 134% to \$177 trillion, than in the exchange rate segment, up by 54% to \$32 trillion.



<sup>19</sup> At the same time, there does not appear to have been an increased concentration across intermediaries. See the press release "Triennial and semiannual central bank surveys on positions in the OTC derivatives market in June 2004 – Preliminary global results", 6 December 2004.

<sup>20</sup> See Section D for a definition of notional amounts.

Global positions in OTC derivatives markets by type of instrument <sup>1</sup>						
In billions of US dollars						
	Positions at end-June 2001			Positions at end-June 2004		
	Notional amounts	Gross market values	Percent-ages <sup>2</sup>	Notional amounts	Gross market values	Percent-ages <sup>2</sup>
Foreign exchange contracts	20,435	967	4.7	31,500	1,116	3.5
Outright forwards and forex swaps	13,275	548	4.1	16,764	461	2.8
Currency swaps	4,302	339	7.9	7,939	506	6.4
Options	2,824	80	2.8	6,789	149	2.2
Other	33	0	0	8	0	0.0
<i>Memo:</i>						
<i>Exchange-traded currency contracts<sup>3</sup></i>	66	...	...	98	...	...
Interest rate contracts <sup>4</sup>	75,813	1,748	2.3	177,457	4,582	2.6
FRAs	7,678	32	0.4	14,399	211	1.5
Swaps	57,220	1,531	2.7	137,277	3,978	2.9
Options	10,913	185	1.7	25,757	393	1.5
Other	2	0	0	25	0	
<i>Memo:</i>						
<i>Exchange-traded interest rate contracts<sup>3</sup></i>	17,515	...	...	49,385		
Equity-linked contracts	2,039	220	10.7	5,094	321	6.3
Forwards and swaps	373	55	14.5	773	72	9.3
Options	1,666	164	9.8	4,321	249	5.8
<i>Memo:</i>						
<i>Exchange-traded equity index contracts<sup>3</sup></i>	1,912	...	...	3,318	...	...
Commodity contracts	674	88	13	1,354	176	13.0
Gold	278	25	8.6	359	46	12.8
Other	396	63	15.9	995	130	13.1
Forwards and swaps	235	...	...	541	...	
Options	162	...	...	453	...	
Credit-linked and other contracts	698	22	3	4,664	196	4.2
Total contracts	99,659	3,042	3.1	220,070	6,391	2.9

<sup>1</sup> Adjusted for inter-dealer double-counting. <sup>2</sup> Gross market values as a percentage of notional amounts. <sup>3</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. <sup>4</sup> Single currency contracts only.

Table C.6

The rate of growth of outstanding amounts was also high for other risk categories: it reached 150% for equity-linked contracts, to \$5 trillion, 100% for commodity contracts, to \$1 trillion, and 568% for credit-linked contracts, to \$5 trillion (Table C.6). The explosive growth of credit-related products reflects the relatively immature state of the market, with a rapidly expanding range of products, maturities and contracts being the object of hedging demand and speculative investment.

## 2.2 Market segments and currency composition

Within the interest rate segment, stocks of interest rate swaps increased by 140%, to \$137 trillion, and those of interest rate options by 136%, to

\$26 trillion. Among foreign exchange contracts, the stock of outright forward and foreign exchange swaps was up by a relatively subdued 26%; the stock of currency swaps and options were up by a more robust 85% and 140%, respectively (Table C.6).

Similar growth rates across currencies

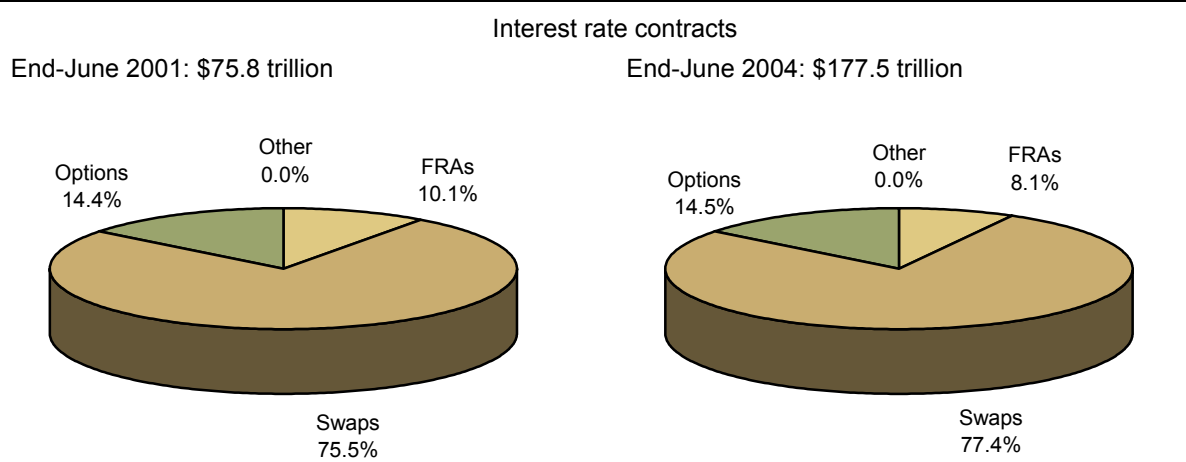
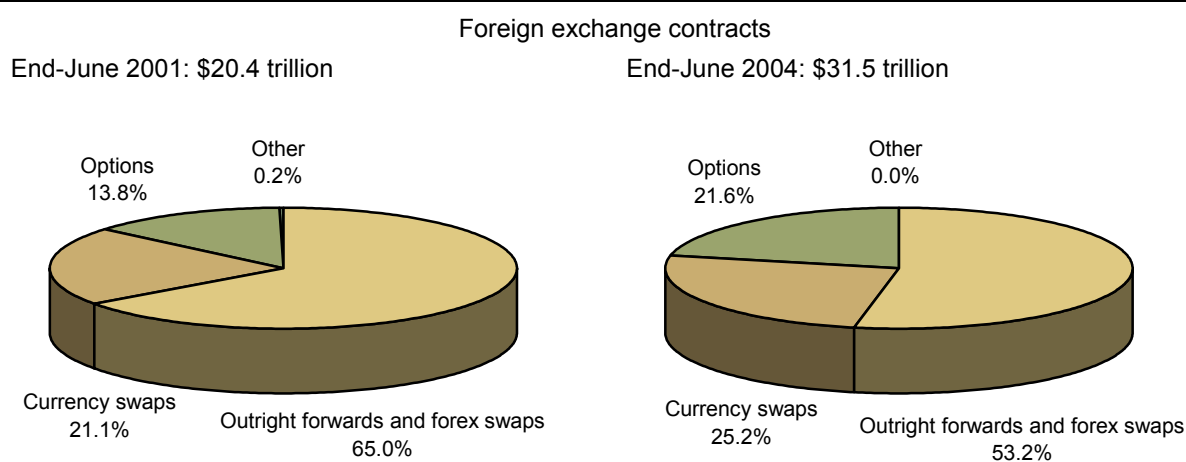
The growth rates of notional amounts were similar across currencies of denomination (Tables C.7 and C.8). In exchange rate contracts, dollar, euro- and sterling-denominated components grew by 55%, 60% and 74%, respectively. In the interest rate segment, notional amounts of euro-denominated derivatives rose by 171%, compared with 139% for dollar-denominated derivatives.

### 2.3 Maturity of contracts

Longer contract maturities

Maturities of outstanding positions have continued to lengthen. While there was robust growth in all maturity segments, growth for the longer maturities has been higher than average for both interest rate and currency products. In the

Reported global notional amounts outstanding in OTC derivatives markets by instrument<sup>1</sup>



<sup>1</sup> Net of inter-dealer double-counting.

Graph C.3

Main features of positions in OTC foreign exchange derivatives markets <sup>1</sup>						
Amounts outstanding, in billions of US dollars						
	End-June 1998		End-June 2001		End-June 2004	
	Notional amounts	Gross market values	Notional amounts	Gross market values	Notional amounts	Gross market values
Total contracts	22,055	982	20,435	967	31,500	1,116
by counterparty <sup>2</sup>						
reporting dealers	8,852	385	7,279	304	12,473	360
other financial institutions	8,222	368	8,690	412	11,939	438
non-financial customers	4,981	229	4,466	251	7,080	318
by maturity <sup>3</sup>						
up to one year	19,111	...	15,906	...	24,706	...
between one and five years	2,214	...	3,293	...	4,712	...
over five years	729	...	1,206	...	2,067	...
by currency <sup>4</sup>						
US dollar	19,169	914	18,341	863	28,402	1,040
Euro	...	...	7,325	366	11,726	476
Deutsche mark	5,271	145	...	...	...	...
French franc	1,638	43	...	...	...	...
Other EMS currencies	2,391	...	...	...	...	...
Japanese yen	6,194	384	4,888	259	7,265	211
Pound sterling	2,723	72	2,912	93	5,078	168
Swiss franc	1,266	44	996	45	1,590	48
Other	5,458	...	6,408	308	8,939	287
<i>Memo:</i>						
<i>Exchange-traded contracts<sup>5</sup></i>	139	...	66	...	98	...

<sup>1</sup> Adjusted for inter-dealer double-counting. <sup>2</sup> No counterparty breakdown available for other products. <sup>3</sup> Remaining maturity. <sup>4</sup> Counting both currency sides of every foreign exchange transaction means that the currency breakdown sums to 200% of the aggregate. <sup>5</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Table C.7

interest rate segment, positions in short-maturity products (life lower than one year) expanded by 112%, while the medium-term (one to five years) and long-term (over five years) segments grew by 141% and 157% respectively. In the foreign exchange segment, the stock of short-maturity contracts rose by 55%, while medium- and long-term contracts were up by 43% and 71%, respectively.

#### 2.4 Types of counterparty

Positions in the OTC currency derivatives markets varied significantly across the various counterparties. Stocks increased especially for transactions with reporting dealers and non-financial firms, up by 71% and 59%, respectively. Stocks of positions taken with other financial institutions (hedge funds, pension funds and central banks) also expanded but at a much lower than average rate of 37%. In the interest rate segment, stocks outstanding reflecting positions with non-financials were up by 217%.

## Main features of positions in OTC interest rate derivatives markets<sup>1</sup>

Amounts outstanding in billions of US dollars

	End-June 1998		End-June 2001		End-June 2004	
	Notional amounts	Gross market values	Notional amounts	Gross market values	Notional amounts	Gross market values
Total contracts	48,124	1,354	75,813	1,748	177,457	4,582
by counterparty <sup>2</sup>						
reporting dealers	21,477	543	36,320	791	78,999	1,903
other financial institutions	20,473	599	31,961	750	74,573	1,972
non-financial customers	6,174	212	7,531	208	23,860	707
by maturity <sup>3</sup>						
up to one year	20,176	...	29,160	...	61,909	...
between one and five years	19,010	...	29,470	...	71,275	...
over five years	8,938	...	17,184	...	44,241	...
by currency						
US dollar	14,349	346	25,666	635	61,451	1,542
Euro	...	...	24,556	509	66,569	1,839
Deutsche mark	6,993	209	...	...	...	...
French franc	3,720	126	...	...	...	...
Other EMS currencies	4,479	...	...	...	...	...
Japanese yen	7,676	211	11,913	336	21,900	360
Pound sterling	3,846	70	6,052	112	13,149	255
Swiss franc	1,166	22	1,303	20	2,920	52
Other	5,895	...	6,323	135	11,468	534
<i>Memo:</i>						
<i>Exchange-traded contracts<sup>4</sup></i>	13,216	...	17,515	...	49,385	...

<sup>1</sup> Single currency contracts adjusted for inter-dealer double-counting. <sup>2</sup> No counterparty breakdown available for other products <sup>3</sup> Remaining maturity <sup>4</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Table C.8

### 2.5 Global gross market values in OTC derivatives markets

Gross market values<sup>21</sup> more than doubled, from \$3.0 trillion at end-June 2001 to \$6.4 trillion at end-June 2004 (Tables C.6 to C.8). The increase in gross market values was lower than the corresponding increase in outstanding amounts (121%), so that the ratio of the two stocks decreased slightly from 3.1% at end-June 2001 to 2.9% at end-June 2004. Over the same period, gross market values rose slightly in relation to the stock of domestic and international securities issues in major financial markets (from 7% to 10%) or international banking assets (from 22% to 29%).<sup>22</sup>

Growth in gross market value mainly due to interest rate-related products

The growth in gross market values relative to notional amounts was due mainly to interest rate products, where the ratio advanced from 2.3% to 2.6%. The increase in the interest rate segment is likely to derive, in large part, from the higher interest rate volatility in mid-2004. Analogously, the noticeable drop

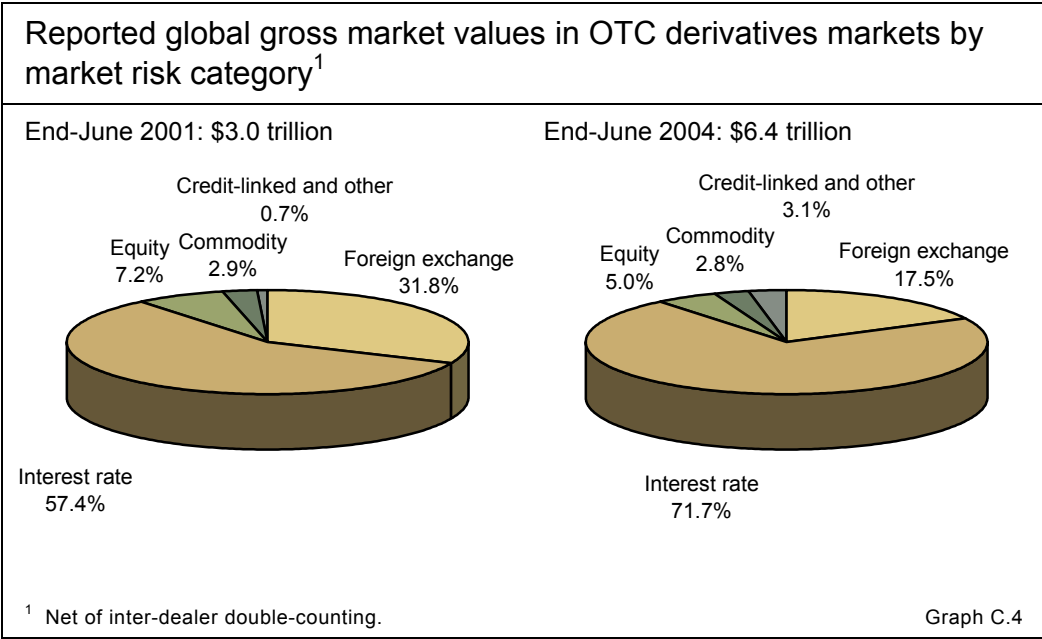
<sup>21</sup> See Section D for a definition of gross market values.

<sup>22</sup> See Annex Tables 1, 11 and 16A in the *BIS Quarterly Review*.

in the volatility of equity markets and the stability of the main stock indices in the first half of 2004 probably contributed to a large decline in the market to notional ratio of equity-linked contracts, from 10.7% to 6.3%.

As in the past, gross market values overstate actual credit exposures. When legally enforceable bilateral netting and other risk-reducing arrangements are taken into account, the credit exposure of reporting institutions amounts to \$1.5 trillion (Table C.5).

Credit exposures overstated by gross market values



## D. Methodology

This publication combines the results of the most recent triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, which was carried out by central banks and monetary authorities in 52 countries for April and end-June 2004 and the results of the semi-annual OTC derivatives statistics at end-June 2004. The objective is to obtain comprehensive and internationally consistent information on the size and structure of foreign exchange and over-the-counter (OTC) derivatives markets, to increase market transparency and thereby help central banks, other authorities and market participants to better monitor patterns of activity in the global financial system. The triennial survey and the regular derivatives statistics complement each other in the following way:

- The latest triennial survey covered foreign exchange and OTC derivatives turnover in April 2004, as reported by around 1200 market participants<sup>23</sup> in 52 countries on a gross and unconsolidated basis (ie in-house deals and deals with other offices of the same institution were not netted out).
- In addition, the triennial survey covered notional amounts outstanding and gross market values of OTC derivatives positions at end-June 2004, as reported by dealers in 44 countries including non-regular reporters in seven G10 countries on a worldwide consolidated basis. Consolidated reporting relates to global activity of the head office and all its domestic and foreign branches and subsidiaries, with positions between own offices of the same reporting institution being netted out.
- These data were supplemented by the semi-annual OTC derivatives statistics, which covered notional amounts outstanding and gross market values of OTC derivatives positions at end-June 2004, as reported by 67 dealers in the G10 countries reporting regularly on a worldwide consolidated basis.

The data presented here are fairly comparable with those of the previous triennial central bank survey in 2001 as the increase from 48 to 52 participating countries had only little effect on the overall coverage of the survey (see Table B-6). The format of the 2004 survey includes the following clarifications compared with the 2001 survey:

- The reporting dealer concept, in order to better distinguish between interdealer and customer transactions (see Section D.7)
- The definition of the location of deals (see Section D.2)
- The definition of related party (in-house) deals (see Section D.2)

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<sup>23</sup> Due to a raise of the reporting threshold for turnover the number of reporters was reduced from 2,530 in 2001.

## 1. Coverage

Data were collected on foreign exchange transactions and OTC derivative products according to the following broad market risk categories:

(a) for turnover

- foreign exchange transactions
- single-currency interest rate derivatives

(b) for amounts outstanding

- foreign exchange and gold contracts
- single-currency interest rate derivatives
- equity, commodity, credit and “other” derivatives

For turnover, the category of foreign exchange transactions covered both cash (ie foreign exchange spot transactions) and derivative instruments. All other categories for turnover and amounts outstanding comprised derivative instruments only. For derivatives, the following instrument breakdown was requested in each market risk category:

- forwards
- swaps
- OTC options sold
- OTC options bought
- other products

To gauge the size of the foreign exchange and derivatives markets, the following types of data were collected:

- turnover in nominal or notional amounts
- outstandings in nominal or notional amounts
- outstandings in gross market values

## 2. Turnover data

Turnover data provide a measure of market activity, and can also provide a rough proxy for market liquidity. Turnover was defined as the absolute gross value of all deals concluded (but not closed) during the month, and was measured in terms of the nominal or notional amount of the contracts. In addition to foreign exchange spot transactions, turnover data were requested for foreign exchange and interest rate derivatives.

No distinction was made between sales and purchases (ie a purchase of \$5 million against sterling and a sale of \$7 million against sterling would amount to a gross turnover of \$12 million). Direct cross-currency transactions were counted as single transactions; however, cross-currency transactions passing through a vehicle currency were recorded as two separate deals against the vehicle currency. The gross amount of each transaction was recorded once, and netting arrangements and offsets were ignored. For turnover of transactions with variable nominal or notional principal amounts, the nominal or notional principal amount on the transaction date was reported.

For turnover data, the basis for reporting was the location of the *sales* desk of any trade, even if deals entered into in different locations were booked in a central location. Thus, transactions concluded by offices located abroad

should not be reported by the country of location of the head office, but by that of the office abroad (insofar as the latter is a reporting institution in one of the other reporting countries). Where no sales desk was involved in a deal, the *trading* desk was used to determine the location of deals. The definition of the reporting basis was clarified to provide more consistent data.

Reporting institutions (called Reporting dealers) were asked to include in their reported aggregates trades with their own branches and subsidiaries and between affiliated firms, and to identify them as a separate “of which” memorandum item, under related party trades. However, trades that were conducted as back-to-back deals and trades to facilitate internal bookkeeping and internal risk management within a given institution, as well as trades between desks and offices of the reporting dealer located in the same country, were excluded from the reporting. The reported trades with own branches and subsidiaries and between affiliated firms were allocated to the category of reporting dealers or other financial institutions depending on whether the counterparty was a reporting dealer or not. Thus the definition of related party trades has been clarified as compared with the previous survey in order to improve consistency of data reporting.

The guiding principle is that each trade is reported once, and only once.

In all cases, transactions were reported to the BIS in US dollar equivalents, with non-dollar amounts generally converted into US dollars using the exchange rate prevailing on the date of the trade.

As in the previous triennial foreign exchange market surveys, turnover data were collected over a one-month period in order to reduce the likelihood that very short-term variations in activity might contaminate the data. The data collected for the survey reflected all transactions entered into during the calendar month of April 2004, regardless of whether delivery or settlement was made during that month.

In order to allow a comparison across countries, daily averages of turnover were computed by dividing aggregate monthly turnover for the country in question by the number of days in April on which the foreign exchange and derivatives markets in that country were open. The number of trading days ranged from 17 to 25.

Turnover was reduced by the fact that Easter fell during the month of the survey. The length of the Easter holiday varied from centre to centre, and even though a given market may have been open, trading, particularly cross-border trading, is likely to have been curtailed by the inability to conclude transactions with dealers in markets, which were closed. No other exceptional events were reported to have affected trading in the month of April.

### 3. Nominal or notional amounts outstanding

Nominal or notional amounts outstanding provide a measure of market size, and can also provide a rough proxy for the potential transfer of price risk in derivatives markets. They are also comparable to measures of market size in related underlying cash markets and shed useful light on the relative size and growth of cash and derivatives markets.

Nominal or notional amounts outstanding were defined as the absolute gross nominal or notional value of all deals concluded and still open at end-June 2004; the date of end-June was chosen to provide consistency with the semi-annual OTC derivatives market statistics for the G10 countries.

As in the case of the turnover data, no distinction was made between sales and purchases of derivative instruments and the resulting claims and liabilities of open contracts. In the case of foreign exchange swaps, which were concluded as spot/forward transactions, only the unsettled forward part of the deal was reported. If foreign exchange swaps were executed on a forward/forward basis, amounts outstanding were to be reported separately for both legs. For other forward contracts and swaps, the transactions were always to be reported as one transaction only. For transactions with variable nominal or notional principal amounts, nominal or notional principal amounts at the reporting date were to be provided.

In contrast to turnover data, the basis for reporting of nominal and notional amounts outstanding was the global book of the head office and all branches and (majority-owned) subsidiaries of a given institution. All these positions had to be added together and reported by the parent institution only to the monetary institution in the country where the parent institution had its head office. In addition, all positions had to be reported on a worldwide consolidated basis, ie all in-house deals and deals with other domestic and foreign offices of the same institution had to be netted out.

Amounts outstanding were reported to the BIS in US dollar equivalents, with non-dollar amounts converted into US dollars using end-of-period exchange rates.

#### 4. Gross market values

Another measure of the size of derivatives markets is provided by outstandings in terms of gross market values. Gross market values also supply information about the scale of gross transfer of price risks in the derivatives markets. Furthermore, gross market value at current market prices provides a measure of derivatives market size and economic significance that is readily comparable across markets and products. Gross market values are defined as the sums of the absolute values of all open contracts with either positive or negative replacement values evaluated at market prices prevailing at the reporting date. Replacement value stands for the price to be received or paid if the instrument were sold in the market at the time of reporting. Market values are the amounts at which a contract could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale. If a quoted price is available for a contract, the number of trading units should be multiplied by that market price. If a quoted market price is not available, the reporting institution should provide its best estimate of market value based on the quoted price of a similar contract or on valuation techniques such as discounted cash flows.

Gross market value is defined as the value of all open contracts before counterparty or any other netting. Thus, the gross positive market value of a firm's outstanding contracts is the sum of all positive replacement values of a

firm's contracts. Similarly, the gross negative market value is the sum of all negative values of a firm's contracts.

The term gross is used to indicate that contracts with positive and negative replacement values with the same counterparty should not be netted. Nor should the sums of positive and negative contract values be set off against each other within a risk category such as foreign exchange, interest rate, equity, commodity, credit and "other".

In the case of forwards and swaps, the market (or replacement) value of outstanding contracts to which the reporter is a counterparty is either positive, zero or negative, depending on how underlying prices have moved since the contract's initiation.

Unlike forwards or swaps, OTC options have a market value at initiation, which is equal to the premium paid to the writer of the option. Throughout their life option contracts can only have a positive market value for the buyer and a negative market value for the seller. If a quoted market price is available for a contract, the market value to be reported for that contract is the product of the number of trading units of the contract multiplied by that market price. If a quoted market price is not available, the market value of an outstanding option contract at the time of reporting can be determined on the basis of secondary market prices for options with the same strike prices and remaining maturities as the options being valued, or by using option pricing models. In an option pricing model, current quotes of forward prices for the underlying (spot prices for American options) and the implied volatility and market interest rate relevant to the option's maturity would normally be used to calculate the "market" values.

Gross positive market value is the sum of the current market values of all purchased options, and gross negative market value is the sum of the values of sold options. Options sold and purchased with the same counterparty were not be netted against each other, nor were offsetting bought and sold options on the same underlying.

Data on amounts outstanding were reported as at end-June 2004, in US dollar equivalents, with non-dollar amounts converted into US dollars using end-of-period exchange rates.

## 5. Market risk categories

Individual derivatives transactions were to be categorised into six risk classes: foreign exchange, singlecurrency, interest rate, equity, commodity, credit and "other". In practice, however, individual derivatives transactions may straddle more than one risk category. In such cases, transactions that are simple combinations of exposures should be reported separately in terms of their individual components. Transactions that cannot be readily broken down into separable risk components should be reported in only one risk category. The allocation of such products with multiple exposures should be determined by the underlying risk component that is most significant. However, if, for practical reasons, reporting institutions are in doubt about the correct classification of

multi-exposure derivatives, they should allocate the deals according to the following order of precedence:

*Commodities.* All derivatives transactions involving a commodity or commodity index exposure, whether or not they involve a joint exposure in commodities and any other risk category (ie foreign exchange, interest rate or equity), should be reported in this category.

*Equities.* With the exception of contracts with a joint exposure to commodities and equities, which are to be reported as commodities, all derivatives transactions with a link to the performance of equities or equity indices should be reported in the equity category. That is, equity deals with exposure to foreign exchange or interest rates should be included in this category. Quanto-type instruments are an example of deals with joint equity and foreign currency exposures, and would be reported in this category.

*Foreign exchange.* This category will include all derivatives transactions (with the exception of those already reported in the commodity or equity categories) with exposure to more than one currency, be it in interest or exchange rates.

*Single-currency interest rate contracts.* This category will include derivatives transactions in which there is exposure to only one currency's interest rate. This category should include all fixed and/or floating single-currency interest rate contracts including forwards, swaps and options.

## 6. Instrument definitions and categorisation

In each market risk category, derivatives were broken down by three types of plain vanilla instrument (forwards, swaps and options). Plain vanilla instruments were defined as instruments which are traded in generally liquid markets according to more or less standardised contracts and market conventions. If a transaction was composed of several "plain vanilla" components, each part was in principle to be reported separately.

In addition, there was a separate category for other products. This category mainly included transactions with a variable notional principal amount or contract features which act to multiply leverage. Furthermore, deals where a decomposition into individual "plain vanilla" components was impractical or impossible were also classified as other products.

Foreign exchange spot and derivatives transactions were defined and categorised as follows:

### *Foreign exchange transactions*

*Spot transaction*      Single outright transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) within two business days. The spot legs of swaps were not included among spot transactions but were treated as swap transactions even when they were for settlement within two days (ie including "tomorrow/next day" transactions).

<i>Outright forward</i>	Transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) at some time in the future (more than two business days later).
<i>Foreign exchange swap</i>	Transaction which involves the actual exchange of two currencies (principal amount only) on a specific date at a rate agreed at the time of conclusion of the contract (the short leg), and a reverse exchange of the same two currencies at a date further in the future and at a rate (generally different from the rate applied to the short leg) agreed at the time of the contract (the long leg). Both spot/forward and forward/forward swaps are included. Short-term swaps carried out as “tomorrow/next day” transactions are also included in this category.
<i>Currency swap</i>	Contract which commits two counterparties to exchange streams of interest payments in different currencies for an agreed period of time and to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity.
<i>Currency option/warrant</i>	Option contract that gives the right to buy or sell a currency with another currency at a specified exchange rate during a specified period. This category also includes exotic foreign exchange options such as average rate options and barrier options.
<i>Currency swaption</i>	Option to enter into a currency swap contract.

The options section took precedence in the instrument classification, so that any foreign exchange derivative product with an embedded option was to be reported as an option. All other foreign exchange derivative products were in principle to be reported in the forwards or swaps section. However, foreign exchange derivative instruments which involved several features and where a decomposition into individual “plain vanilla” components was impractical or impossible, such as swaps with underlying notional principal in one currency and fixed or floating interest rate payments based on interest rates in currencies other than the notional (differential swaps or diff swaps), were to be allocated to the residual category of “other” foreign exchange products.

#### *Single-currency interest rate derivatives*

<i>Forward rate agreement (FRA)</i>	Interest rate forward contract in which the rate to be paid or received on a specific obligation for a set period of time, beginning at some time in the future, is determined at contract initiation.
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<i>Interest rate swap</i>	Agreement to exchange periodic payments related to interest rates on a single currency; can be fixed for floating, or floating for floating based on different indices. This group includes those swaps whose notional principal is amortised according to a fixed schedule independent of interest rates.
<i>Interest rate option/warrant</i>	Option contract that gives the right to pay or receive a specific interest rate on a predetermined principal for a set period of time.
<i>Interest rate cap</i>	Option that pays the difference between a floating interest rate and the cap rate.
<i>Interest rate floor</i>	Option that pays the difference between the floor rate and a floating interest rate.
<i>Interest rate collar</i>	Combination of cap and floor.
<i>Interest rate corridor</i>	1) A combination of two caps, one purchased by a borrower at a set strike and the other sold by the borrower at a higher strike to, in effect, offset part of the premium of the first cap. 2) A collar on a swap created with two swaptions – the structure and participation interval is determined by the strikes and types of the swaptions. 3) A digital knockout option with two barriers bracketing the current level of a long-term interest rate.
<i>Interest rate swaption</i>	Option to enter into an interest rate swap contract, purchasing the right to pay or receive a certain fixed rate.

The options section took precedence in the instrument classification, so that any interest rate derivative product with an embedded option was to be reported as an option. All other interest rate derivative products were to be reported in the forwards or swaps section. However, interest rate derivative instruments with leveraged payoffs and/or those whose notional principal varies as a function of interest rates, such as swaps based on Libor squared as well as index-amortising rate swaps, were to be allocated to the residual category of “other” interest rate products.

#### *Equity and stock index derivatives*

<i>Equity forward</i>	Contract to exchange an equity or equity basket at a set price at a future date.
<i>Equity swap</i>	Contract in which one or both payments are linked to the performance of equities or an equity index (eg S&P 500). It involves the exchange of one equity or equity index return for another, or the exchange of an equity or equity index return for a floating or fixed interest rate.
<i>Equity option/warrant</i>	Option contract that gives the right to deliver or receive a specific equity or equity basket at an agreed price at an agreed time in the future.

The equity section did not have an “other” derivative product section; other equity products therefore had to be reported in either the options or the forwards and swaps section. The options section took precedence in the instrument classification, so that any equity derivative product with an embedded option was to be reported as an option. All other equity derivative products were to be reported in the forwards and swaps section.

#### *Commodity derivatives*

<i>Commodity forward</i>	Forward contract to exchange a commodity or commodity index at a set price at a future date.
<i>Commodity swap</i>	Contract with one or both payments linked to the performance of a commodity price or a commodity index. It involves the exchange of the return on one commodity or commodity index for another, or the exchange of a commodity or commodity index for a floating or fixed interest rate.
<i>Commodity option</i>	Option contract that gives the right to deliver or receive a specific commodity or commodity index at an agreed price at a set date in the future.

The commodity section did not have an “other” derivative product section; other commodity products therefore had to be reported in either the options or the forwards and swaps section. The options section took precedence in the instrument classification, so that any commodity derivative product with an embedded option was to be reported as an option. All other commodity derivative products were to be reported in the forwards and swaps section.

#### *Credit derivatives*

<i>Credit spread forward</i>	Agreement to pay or receive at some time in the future a cash payment which depends on the difference between a spread (ie the difference in yields between two financial assets) agreed at contract initiation and that prevailing at settlement.
<i>Credit event/default swap</i>	Contract which commits two counterparties to exchange a periodic fee in exchange for a payment contingent on a default event or any other agreed change in the credit quality of a reference asset for an agreed period of time.
<i>Total return swap</i>	Contract which commits two counterparties to exchange the total economic performance of a financial asset (defined to include all interest payments and fees plus any capital appreciation or depreciation) in exchange for a floating rate payout based on a reference index (usually Libor plus a spread reflecting the creditworthiness of the counterparty as well as the credit rating and liquidity of the underlying asset).

*Credit spread option* Option contract that gives the right to receive a cash payment if a spread, ie the difference in yields between two financial assets, widens beyond an agreed strike level during a specific period.

## 7. Counterparties

Following the methodology of the previous triennial central bank surveys, reporting institutions were requested to provide for each instrument in the foreign exchange, interest rate, equity, credit and “other” derivatives risk categories a breakdown of contracts by counterparty as follows: reporting dealers, other financial institutions and non-financial customers. In the turnover part of the survey, reporters were requested to provide separate information on local and cross-border transactions. The distinction between local and cross-border had to be determined according to the location of the counterparty and not its nationality.

The definition of reporting dealers and other financial institutions has been changed from the previous survey in order to better distinguish between interdealer and customer transactions.

### *7.1 Reporting dealers*

Reporting dealers refer to financial institutions that actively participate in local and global foreign exchange and derivatives markets. These are mainly large commercial and investment banks and securities houses that (1) participate in the interdealer market and/or (2) have an active business with large customers, such as large corporate firms, governments and other non-reporting financial institutions; in other words, reporting dealers are institutions that are actively buying and selling currency and OTC derivatives both for their own account and/or in meeting customer demand. In practice, reporting dealers are often those institutions that actively or regularly deal through electronic platforms, such as EBS or Reuters dealing facilities. The category of reporting dealers also includes the branches and subsidiaries of institutions operating in multiple locations that do not have a trading desk but do have a sales desk in those locations that conduct active business with large customers.

### *7.2 Other financial institutions*

This category covers the financial institutions that are not classified as reporting dealers. Thus, it mainly covers all other financial institutions, such as smaller commercial banks, investment banks and securities houses, and in addition mutual funds, pension funds, hedge funds, currency funds, money market funds, building societies, leasing companies, insurance companies, other financial subsidiaries of corporate firms and central banks.

### *7.3 Non-financial customers*

This category covers any counterparty other than those describe above, ie mainly non-financial end-users, such as corporates and governments.

The reason for not including all reporting institutions in the category of “reporting dealers” in the amounts outstanding part of the survey is to ensure consistency with the regular derivatives market statistics and to limit the reporting burden for regular reporters. While this approach makes it difficult to accurately eliminate double-counting of trades between non-regular reporters (see below), the amounts involved were believed to be small.

## 8. Currency and other market risk breakdowns

In order to obtain consistent data on turnover in principal currency segments of the foreign exchange market, reporting institutions were asked to report turnover data on foreign exchange contracts in principle with a similar breakdown by currency pairs as in the previous surveys. As a result, data were provided separately for trading in domestic currency, US dollars and euro against each other and against the following individual currencies:

Japanese yen, pound sterling, Swiss franc, Canadian dollar, Australian dollar and other currencies. Supplementary information was provided on total turnover for the following currencies, which were also included in the column for “other” currencies in the breakdown by currency pairs:

Brazilian real, Chinese renminbi, Czech koruna, Danish krone, Hong Kong dollar, Hungarian forint, Indian rupee, Indonesian rupiah, Korean won, Mexican peso, New Zealand dollar, Norwegian krone, Philippine peso, Polish zloty, Russian rouble, Singapore dollar, South African rand, Swedish krona, new Taiwan dollar, Thai bath and Turkish lira.

For turnover of single-currency interest rate contracts the previous currency breakdown was provided again: domestic currency, Australian dollar, Canadian dollar, euro, Japanese yen, pound sterling, Swiss franc, US dollar, as well as Danish krone, Hong Kong dollar, Indonesian rupiah, Mexican peso, New Zealand dollar, Norwegian krone, Singapore dollar, Swedish krona, and Thai bath.

For amounts outstanding of foreign exchange and interest rate contracts, the following currency breakdown was requested:

US dollar, euro, Japanese yen, Pound sterling, Swiss franc and other currencies.

In addition, reporting institutions were asked to identify amounts for individual other currencies if they had a material amount of outstanding contracts in those currencies, such as for example if a notional amount outstanding in a currency for a given instrument was greater than 2% of the total notional amount outstanding for that instrument. However, participating central banks had discretion in defining a “material” amount for reporting of individual other currencies.

In contrast to the turnover part of the survey, amounts outstanding of foreign exchange contracts were broken down on a single-currency basis. This means that the notional amount outstanding and the gross positive or negative market value of each contract were reported twice, according to the currencies making up the two “legs” of the contract. The total of the amounts reported for individual currencies thus adds up to 200% of total contracts outstanding, while

total reported contracts represent only half of the sum of the individual currency components. For example, a reporting institution entering into a forward contract to purchase US dollars in exchange for euro with a notional principal amount of \$100 million reported \$100 million in the US dollar column, another \$100 million in the euro column, and also \$100 million in the "Total" column.

Notional amounts outstanding of equity and stock index derivatives were categorised according to whether they related to US, Japanese, European (excluding countries in eastern Europe), Latin American, other Asian or other countries' equity and stock indices. The contracts had to be allocated according to the nationality of the issuer of the underlying rather than the country where the instrument is being traded. For commodity, credit and "other" derivatives, no further breakdown by risk factor was required.

## 9. Maturities

In the turnover part of the survey, transactions in outright forwards and foreign exchange swaps were to be broken down between the following maturity bands:

- seven days or less
- over seven days and up to one year
- over one year

For amounts outstanding of foreign exchange (including gold), interest rate and equity-linked contracts, a breakdown was requested by residual maturity between the following bands:

- one year or less
- over one year and up to five years
- over five years

In the case of transactions where the first leg had not fallen due, the residual maturity had to be determined by the difference between the near- and far-end dates of the transaction and not by the date of conclusion of the deal.

## 10. Elimination of double-counting

Double-counting arises because transactions and positions between two reporting entities are recorded by each of them, ie twice. To derive a measure of overall market size, it is therefore necessary to halve the data on transactions and positions between reporting dealers. To enable this, reporters were asked to distinguish deals contracted with other reporters (dealers). The following methods of adjustment were applied for three types of data: foreign exchange and derivatives turnover, notional amounts outstanding and gross market values of derivatives positions.

In the case of turnover, reported data on local deals with other reporters are firstly divided by two by the BIS and this figure is subtracted from total reported gross data to arrive at so-called "net-gross" figures, ie business net of local inter-dealer double-counting. In a second step, reported data on cross-border deals with other reporters are also divided by two and this figure is

subtracted from total reported “net-gross” data to obtain so-called “net-net” figures, ie business net of local and cross-border inter-dealer double-counting.

In the case of notional amounts outstanding for which data are collected on a worldwide consolidated basis without distinction between local and cross-border deals, reported deals with other reporters were divided by two and this figure was subtracted from total reported “gross-gross” data to immediately obtain “net-net” figures, ie business net of any inter-dealer double-counting. For commodity contracts, for which no counterparty breakdown was collected, the adjustments for double-counting were estimated using the results of the 1995 survey.

In the case of gross market values, for which data are also collected on a worldwide consolidated basis without distinction between local and cross-border deals, the adjustments for double-counting are performed as follows: in a first step, gross positive and negative market values of contracts held by reporting institutions are added to each other to obtain data on a “gross-gross” basis. In a second step, the gross negative market value of contracts with other reporting dealers is subtracted from the “gross-gross” data to immediately arrive at “net-net” figures. For gross market values reported by non-regular reporting institutions, ie dealers which do not participate in the regular derivatives market statistics exercise in the G10 countries, the adjustments for double-counting are assumed to be proportionate to those of the regular reporting institutions. For commodity contracts, for which no counterparty breakdown is collected, the adjustments for double-counting are estimated using the results of the 1995 survey.

## 11. Gaps in reporting

Gaps in reporting stem from two sources: incomplete reporting (ie deals between two non-reporters) in the countries providing data, and less than full coverage of the range of countries in which the surveyed activity takes place. The second type of gap is mitigated by the existence of counterparty reports. The bulk of the cross-border inter-dealer business of dealers located in non-reporting countries is very likely to be captured in the reports of their counterparties in countries participating in the survey. The types of transactions which are not included in the reported data are local as well as cross-border transactions between dealers in non-reporting countries, and those between non-reporting dealers and any customers or other financial institutions wherever they are located.

An estimate for both gaps is provided for turnover in traditional foreign exchange instruments, ie spot transactions, outright forwards and foreign exchange swaps (see Table D-1 below). Gaps from incomplete reporting in the countries providing data were also estimated for turnover, notional amounts outstanding and gross market values of derivative instruments (see Tables C-1 and D-1). The basis for estimating gaps due to incomplete reporting in the countries providing the data was information supplied on the coverage of the survey in each participating country (see Table B-7). For example, if in a given country the coverage of the survey as compared to total market activity was

90%, the gap from incomplete reporting was estimated to represent 10% of reported turnover and amounts outstanding in that country.

Gaps are not estimated for notional amounts outstanding and gross market values because it can be assumed that the coverage for the two latter types of data is almost complete due to the worldwide consolidated reporting of all major dealers in the participating countries, and because of the lack of any information on missing coverage.

In some cases, the sum of sub-items does not equal the total for the category in question. Apart from rounding, this can result from incomplete classification of data, use of residual categories and suppression of data for confidentiality reasons.

## 12. Intertemporal comparisons

Intertemporal comparisons are complicated by changes in coverage and definition and the movement of exchange rates over the three-year periods separating the surveys in the participating countries.

Changes in coverage have been of two kinds. Firstly, within national markets the coverage of dealers active in national markets has changed. An increase in the number of reporting institutions does not, however, necessarily denote greater coverage. If institutions which were not active before, and were therefore not covered in earlier reports, began to deal on a substantial scale, it is legitimate to compare the total turnover of the larger number of reporting institutions with the total turnover of the smaller number reporting their transactions in the previous period. The same applies, of course, in the case of a decrease in the number of reporting institutions due to a reduction of their activity and importance in the market.

The second type of change in coverage relates to the inclusion of a larger number of countries. In 1986 only four countries participated in the triennial foreign exchange turnover survey. In 1989 the number rose to 21, but some of them did not provide all types of information. In 1992 a total of 26 countries, including all countries with important markets, reported comprehensive data on turnover in foreign exchange transactions. In 1995 the number of countries did not increase further, but the coverage of market activity was significantly expanded to include all financial derivatives and to collect data not only on turnover, but on notional amounts outstanding and gross market values as well. In 1998 the number of reporting countries increased to 43 and the coverage of derivatives market activity was further expanded to include separate data on credit-linked derivatives. Finally, in 2001 and 2004 the number of reporting countries increased further to 48 and 52 countries respectively.

While the additional information provided by new reporting countries is valuable, not all of it relates to transactions that were not captured before. The bulk of these countries' cross-border transactions with dealers can be presumed to have been included in the reports of their counterparties in earlier years. In new reporting countries, the business not captured before therefore relates to local inter-dealer transactions and those with non-reporting financial institutions and customers.

Another complication involves changes in definitions. Most changes in definition reflect improvements in compilation procedures. In particular, greater effort has been made since the 1992 survey to classify counterparties accurately and a finer counterparty breakdown has been used. As a result, it is now possible to arrive at more accurate estimates of double-counting and to compile net figures on turnover for many items. However, because this was not possible in earlier years, intertemporal comparisons contain some double-counting. This procedure introduces biases to the extent that the share of inter-dealer business has changed over time. In addition, in 1998 the reporting basis for the amounts outstanding part of the survey was changed substantially as data were collected on a worldwide consolidated basis, as compared to a locational unconsolidated basis in 1995. However, in order to facilitate the comparison between the 1995 and 1998 survey results, reporting institutions were required to provide separate data on contracts with own branches and subsidiaries in 1998.

### 13. Data at constant exchange rates

A substantial complication of intertemporal comparisons may arise from the movement of exchange rates. For comparative purposes, estimates recalculated at average April or end-June 2004 exchange rates have therefore been provided for some major aggregates (see Tables B.1, C.1, C.2 and C.5).

### 14. Annex tables

The detailed aggregated results of the Central Bank Survey of Foreign Exchange and Derivatives Market Activity in April and at end-June 2004 and the semiannual derivatives market statistics in the G10 countries at end-June 2004 are presented in the following Annex tables in two separate sections: the first covering foreign exchange markets, ie turnover in traditional foreign exchange business, such as spot, outright forward and foreign exchange swap deals, and the second comprising OTC derivatives markets, ie turnover, notional amounts outstanding and gross market values of foreign exchange, interest rate, equity, commodity, credit-linked and other derivatives. There is an overlap between the two sections as the second section on OTC derivatives turnover includes data on outright forwards and foreign exchange swaps which are also covered in the first section on turnover in foreign exchange markets.

#### *14.1 Foreign exchange markets*

Tables E.1 to E.3 show total reported foreign exchange market turnover net of both local and cross border double-counting by market segment, counterparty and currency. No adjustments were made for gaps in reporting in these or any other Annex tables. Because of less than full coverage in national markets, the adjustment for local inter-dealer double-counting may be slightly exaggerated.

Because two currencies figure in every transaction, the sum of transactions in all individual currencies shown in Table E.1 equals twice the total transactions shown in the first column. Information by currency pair is

shown for the US dollar in Table E.2, and for the euro in Table E.3. Because the data in these latter tables relate to currency pairs, the sum of all transactions equals the total for the currency in question, not twice that total. The totals for the currencies in Tables E.2 and E.3 therefore correspond to the figures in the second and third columns of Table E.1. The information on currencies relates only to separately reported transactions. If transactions in a given currency were not identified separately, but placed in the residual (or other currencies), global turnover in that currency is slightly understated. For the major currencies, the amount of underestimation from this source can be presumed to be minimal.

The data on transactions in “currencies of other reporting countries” relate to transactions in the domestic currencies of those reporting countries whose currencies are not shown separately. The residual contains transactions in currencies of other reporting countries if both counterparties to the deal are resident outside the country of the currency of issue, all transactions in currencies of countries outside the reporting area and all other unidentified transactions.

Tables E.4 to E.7 provide information on reported foreign exchange market turnover by country and currency net of local inter-dealer double-counting. No adjustment was made for cross-border double-counting or for gaps in reporting. The totals at the foot of these tables are the sum of the items in the columns in question. They do not correspond to those in Tables E.1 to E.3 because of the absence of an adjustment for cross-border double-counting.

As in Table E.1, the sum of transactions in each individual currency in Table E.4 equals twice the total transactions because two currencies figure in every deal. Because the data in Tables E.5 to E.7 relate to currency pairs, the total for all transactions sums to the total for the currency, not to twice the total.

Tables E.8 to E.13 contain information on reported foreign exchange market turnover by country, counterparty and market segment, and on the maturity breakdown of reported outright forward and foreign exchange swap transactions by country net of local double-counting. No adjustment was made for cross-border double-counting.

Tables E.14 to E.15 contain information on the maturity breakdown of reported outright forward and foreign exchange swaps transactions by currency net of local and cross-border double-counting.

Tables E.16 to E.19 provide an intertemporal comparison of reported foreign exchange turnover net of local double-counting by country and market segment.

#### *14.2 Derivatives markets*

Tables E.20 to E.29 provide information on reported turnover of foreign exchange derivatives by instrument, counterparty and currency, by country and currency, and by country, counterparty and instrument. The data broken down by instrument are calculated net of both local and cross-border counting. The data broken down by country are adjusted for local dealer double-counting only.

Tables E.30 to E.35 contain detailed data on reported turnover of single currency interest rate derivatives by instrument, counterparty and currency, by country and currency, and by country, counterparty and instrument. The data broken down by instrument are calculated net of both local and cross-border double-counting. The data broken down by country are adjusted for local dealer double-counting only.

Tables E.36 to E.37 provide an intertemporal comparison of reported foreign exchange and single currency interest rate derivatives turnover net of local double-counting by country and derivative instrument.

Tables E.38 to E.41 contain detailed data on reported notional amounts outstanding of foreign exchange, single currency interest rate, equity, commodity, credit and other derivatives broken down by instrument, counterparty and market risk factor (ie mainly by currency). The data are adjusted for inter-dealer double-counting.

Tables E.42 to E.45 contain detailed data on reported gross positive and negative market values of foreign exchange, single currency interest rate, equity, commodity, credit and other derivatives by instrument, counterparty and market risk factor (ie mainly currency). The data are not adjusted for inter-dealer double-counting.

Tables E.46 to E.48 provide information on the maturity breakdown of notional amounts outstanding of foreign exchange, single currency interest rate and equity-linked derivatives by instrument and counterparty. The data are adjusted for inter-dealer double-counting.

Tables E.49 to E.51 provide an intertemporal comparison of reported notional amounts outstanding and gross market values of foreign exchange, single currency interest rate and equity-linked derivatives by instrument and counterparty. The data are adjusted for inter-dealer double-counting.

Measures of global foreign exchange market activity					
Daily averages in April, in billions of US dollars					
	1992	1995	1998	2001	2004
Total reported gross turnover	1,293	1,864	2,337	1,863	2,709
Adjustment for local double-counting	-217	-292	-368	-245	-301
Total reported turnover net of local double-counting ('net-gross')	1,076	1,572	1,969	1,618	2,408
Adjustment for cross-border double-counting	-300	-435	-540	-445	-635
Total reported "net-net" turnover	776	1,137	1,429	1,173	1,773
<i>of which: cross-border transactions</i>	392	611	772	674	1,099
Estimated gaps in reporting	44	53	60	26	107
Estimated global turnover	820	1,190	1,490	1,200	1,880

Table D.1