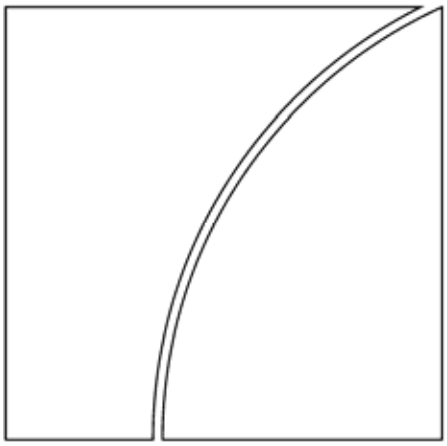
BANK FOR INTERNATIONAL SETTLEMENTS

Triennial Central Bank Survey

December 2007



Foreign exchange and derivatives market activity in 2007

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

Sections A + B:	Alex Heath	tel +41 61 280 8514	e-mail: alex.heath@bis.org
Sections A + C:	Christian Upper	tel +41 61 280 8416	e-mail: christian.upper@bis.org
Sections D + E:	Paola Gallardo	tel +41 61 280 8445	e-mail: paola.gallardo@bis.org
Section D:	Philippe Mesny	tel +41 61 280 8425	e-mail: philippe.mesny@bis.org
Section E:	Carlos Mallo	tel +41 61 280 8256	e-mail: carlos.mallo@bis.org

Copies of publications are available from:

Bank for International Settlements
Press & Communications
CH-4002 Basel, Switzerland

E-mail: publications@bis.org

Fax: +41 61 280 9100 and +41 61 280 8100

ISSN 1814-7348 (print)
ISSN 1814-7356 (online)

ISBN 92-9131-750-0 (print)
ISBN 92-9197-750-0 (online)

Available on the BIS website (www.bis.org).

Contents

Conventions used in the tables

0 = Value close to zero.

... = Reported to be nil, not reported, not shown for reasons of confidentiality, not meaningful or not applicable.

Owing to rounding and incomplete reporting of various breakdowns, the component items do not always sum to the total for the category in question.

Participating institutions

The following are the 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.

Argentina	Central Bank of Argentina
Australia	Reserve Bank of Australia
Austria	Austrian National Bank
Bahrain	Bahrain Monetary Agency
Belgium	National Bank of Belgium
Brazil	Central Bank of Brazil
Bulgaria	Bulgarian National Bank
Canada	Bank of Canada
Chile	Central Bank of Chile
China	The People's Bank of China
	State Administration of Foreign Exchange
Colombia	Bank of the Republic
Czech Republic	Czech National Bank
Denmark	National Bank of Denmark
Estonia	Bank of Estonia
Finland	Bank of Finland
France	Bank of France
Germany	Deutsche Bundesbank
Greece	Bank of Greece
Hong Kong SAR	Hong Kong Monetary Authority
Hungary	Central Bank of Hungary
India	Reserve Bank of India
Indonesia	Bank Indonesia
Ireland	Central Bank and Financial Services Authority of Ireland
Israel	Bank of Israel
Italy	Bank of Italy
	Ufficio Italiano dei Cambi
Japan	Bank of Japan
Korea	Bank of Korea
Latvia	Bank of Latvia
Lithuania	Bank of Lithuania
Luxembourg	Central Bank of Luxembourg
Malaysia	Central Bank of Malaysia
Mexico	Bank of Mexico
Netherlands	Netherlands Bank
New Zealand	Reserve Bank of New Zealand
Norway	Central Bank of Norway
Peru	Central Reserve Bank of Peru
Philippines	Bangko Sentral ng Pilipinas
Poland	National Bank of Poland
Portugal	Bank of Portugal
Romania	National Bank of Romania
Russia	Central Bank of the Russian Federation
Saudi Arabia	Saudi Arabian Monetary Agency

Singapore	Monetary Authority of Singapore
Slovakia	National Bank of Slovakia
Slovenia	Bank of Slovenia
South Africa	South African Reserve Bank
Spain	Bank of Spain
Sweden	Sveriges Riksbank
	Statistics Sweden
Switzerland	Swiss National Bank
Taiwan, China	Central Bank of China
Thailand	Bank of Thailand
Turkey	Central Bank of the Republic of Turkey
United Kingdom	Bank of England
United States	Federal Reserve Bank of New York

Bank for International Settlements

A. Summary of main findings

1. Foreign exchange market turnover

The April 2007 data on turnover in traditional foreign exchange markets highlight several important features of the evolution of these markets. First, average daily turnover has grown by an unprecedented 69% since April 2004, to $3.2 trillion (Table B.1). This increase was much stronger than the one observed between 2001 and 2004. Even abstracting from the valuation effects arising from exchange rate movements, average daily turnover rose by 63%.

Second, growth in turnover was broad-based across instruments. More than half of the increase in turnover can be accounted for by the growth in foreign exchange swaps, which rose 80% compared with 45% over the previous three-year period. Changes in hedging activity may have been one factor underlying the increasing importance of foreign exchange swap instruments. Growth in the turnover of outright forward contracts also picked up significantly to 73%. In contrast, turnover in spot markets increased by 59%, which is somewhat lower than the growth in turnover in the previous three-year period.

Third, the composition of turnover by counterparty changed substantially. Transactions between reporting dealers and non-reporting financial institutions, such as hedge funds, mutual funds, pension funds and insurance companies, more than doubled between April 2004 and April 2007 and contributed more than half of the increase in aggregate turnover (Table B.3). Factors underlying the strength of this segment include strong investor activity in an environment of trending exchange rates and low levels of financial market volatility, a trend shift among institutional investors with a longer-term investment horizon towards holding more internationally diversified portfolios and a marked increase in the levels of technical trading. Turnover between reporting dealers and non-financial customers also more than doubled. Consequently, the share of turnover resulting from transactions between reporting dealers, ie the interbank market, fell to 43%, despite growth in this segment being slightly lower than in the previous three-year period.

Fourth, the currency composition of turnover has become more diversified over the past three years (Table B.6). The share of the four largest currencies fell, although the US dollar/euro continued to be the most traded currency pair. The most notable increases in share were for the Hong Kong dollar, which has benefited from being associated with the economic expansion of China, and the New Zealand dollar, which has attracted attention from investors as a high-yielding currency. More broadly, the share of emerging market currencies in total turnover has increased, to almost 20% in April 2007.

Finally, the geographical distribution of foreign exchange trading did not change significantly (Table B.2). Among countries with major financial centres,

Singapore, Switzerland and the United Kingdom gained market share, while the shares of Japan and the United States dropped. In some cases, changing shares reflected the relocation of desks.

2. OTC derivatives market turnover

Activity in OTC derivatives markets was vibrant in April 2007. Average daily turnover in OTC foreign exchange and interest rate contracts went up by 73% relative to the previous survey in 2004, to reach $4,198 billion in April 2007[1] (Table C.1). This corresponds to an annual compound rate of growth of 20%, which is higher than the 14% growth recorded since the derivatives part of triennial survey was started in 1995. Activity in foreign exchange derivatives rose by 78%, slightly above the rate of increase reported for the spot market (59%). More moderate growth was recorded in the interest rate segment, where turnover went up by 64%.

3. OTC derivatives notional amounts outstanding and gross market values

Positions in OTC derivatives grew at an even more rapid pace than turnover. Notional amounts outstanding went up by 135% to $516 trillion at the end of June 2007 (Table C.5). This corresponds to an annualised compound rate of growth of 33%, which is higher than the approximately 25% average annual rate of increase since the current format of the triennial survey was established in 1998.

Growth accelerated in all risk categories. The highest rate of increase was reported in the credit segment of the OTC derivatives market, where positions expanded to $51 trillion, from under $5 trillion in the 2004 survey. Notional amounts outstanding of commodity derivatives rose more than sixfold to $8 trillion, although this may reflect a change in the degree of underreporting as well as a genuine increase in positions. Less extreme, but still high rates of growth were reported for the more traditional types of risk traded on the OTC derivatives market. Open positions in interest rate contracts increased by 119% to $389 trillion, and those in equity contracts by 111% to $11 trillion. Growth in notional amounts outstanding of OTC foreign exchange derivatives was less brisk at 83%, taking the volume of open positions in such contracts to $58 trillion.

Notional amounts outstanding provide useful information on the structure of the OTC derivatives market but should not be interpreted as a measure of the riskiness of these positions. While a single comprehensive measure of risk does not exist, a useful concept is the cost of replacing all open contracts at the prevailing market prices. This measure, called gross market value,

[1] This figure includes turnover in outright foreign exchange forwards and FX swaps, which are also contained in the data on activity in the traditional foreign exchange market discussed in the previous section. Turnover in non-traditional FX derivatives, primarily options and currency swaps, and interest rate derivatives (excluding estimated gaps in reporting) increased by 66% to $1.9 trillion in April 2007.

increased at a considerably lower rate (74%) than notional amounts during the reporting period, to $11 trillion at the end of June.

Discrepancies between growth in notional amounts and in gross market values have also been recorded in previous surveys. As a consequence, the ratio of market values to notional amounts fell to 2.2%, from 3.1% in 2001. One reason why the replacement values of derivatives positions increased at a lower rate than face values is that long-term government bond yields in the major currencies, which are the main driver of the market value of interest rate swaps, on balance changed by only very small amounts between mid-2004 and mid-2007. Since interest rate swaps, similar to most other derivatives contracts other than options, tend to be priced such that their initial value is zero, stable long-term rates are usually associated with low replacement values. Implied volatilities, an important input for the market value of options, also remained stable at a low level between the 2004 and the 2007 surveys. By contrast, stock prices rose sharply in most regions, which is consistent with the fact that the replacement value of equity contracts increased at a much faster rate (278%) than notional amounts (111%).

B. Traditional foreign exchange markets

1. Global turnover

Growth in global foreign exchange turnover was strong …

The 2007 survey shows an unprecedented rise in activity in traditional foreign exchange markets compared to 2004. Average daily turnover rose to $3.2 trillion in April 2007, an increase of 69% at current exchange rates and 63% at constant exchange rates (Table B.1). The ratio of foreign exchange turnover to the value of international trade and capital flows has increased somewhat over the past three years, recovering some of the decline observed in the 2001 triennial survey (Graph B.1).

… and broadly based across instruments

Growth in turnover was broadly distributed across instruments. The expansion in FX swap turnover was particularly strong and made the largest contribution to aggregate growth. This is in contrast to the period between 2001 and 2004, when growth in FX swaps was significantly lower than that in spot contracts and outright forwards. The share of FX swap transactions accounted for by contracts with a maturity of less than seven days has increased to 78%, from 73% in April 2004, whereas the share of these short-term contracts in outright forward turnover has fallen slightly. In both cases, contracts with a duration exceeding one year command a relatively small share of the total.

There was little change in the geographical distribution

The geographical distribution of foreign exchange trading typically changes slowly over time, and the 2007 results are no exception (Table B.2). Among countries with major financial centres, Singapore, Switzerland and the United Kingdom gained market share, while the shares of Japan and the United States dropped. In some cases, changing shares reflected the relocation of desks.

Global foreign exchange market turnover[1]

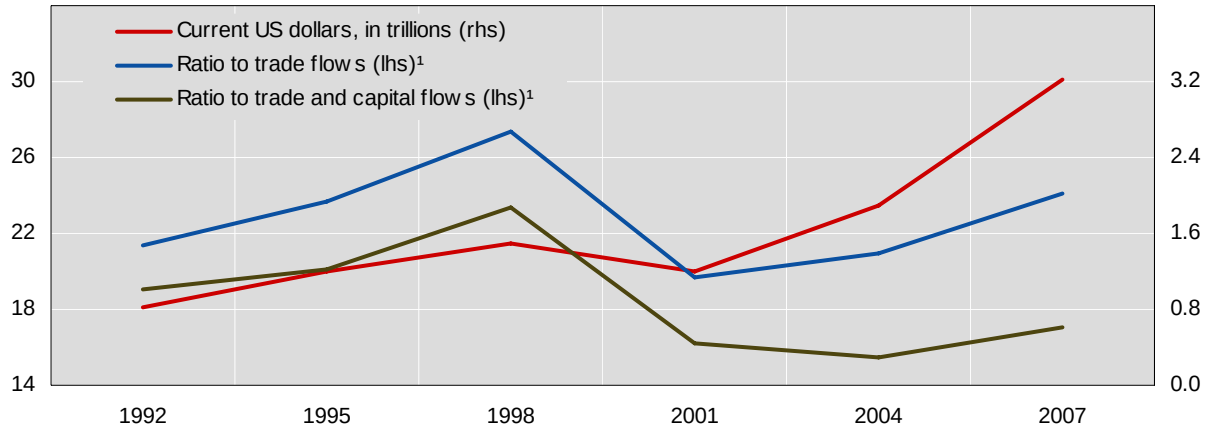
Daily averages in April, in billions of US dollars

	1992	1995	1998	2001	2004[2]	2007
Spot transactions	394	494	568	387	631	1,005
Outright forwards	58	97	128	131	209	362
Up to 7 days	…	50	65	51	92	154
Over 7 days	…	46	62	80	116	208
Foreign exchange swaps	324	546	734	656	954	1,714
Up to 7 days	…	382	528	451	700	1,329
Over 7 days	…	162	202	204	252	382
Estimated gaps in reporting	44	53	60	26	106	129
Total "traditional" turnover	820	1,190	1,490	1,200	1,900	3,210
Memo: Turnover at April 2007 exchange rates[3]	*880*	*1,150*	*1,650*	*1,420*	*1,970*	*3,210*

[1] Adjusted for local and cross-border double-counting. Due to incomplete maturity breakdown, components do not always sum to totals. [2] Data for 2004 have been revised. [3] 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 2007 exchange rates. Table B.1

Foreign exchange turnover

Daily averages in April



[1] 2007 trade and capital flow data are estimated by extrapolating annualised growth between 2004 and 2006.

Source: IMF. Graph B.1

Combined share of the main currrencies declined

By counterparty, the expansion in turnover in the interbank market was comparable to growth over the previous three years, but was outpaced by the increase recorded in the non-financial customer and non-reporting financial institution segments, which more than doubled in size. The currency composition of foreign exchange turnover became a little more dispersed, with the combined share of the US dollar, the euro and the yen in overall turnover falling.

2. Turnover by counterparty

Tunover with non-reporting financial institutions more than doubled …

Half of the growth in aggregate turnover can be attributed to an increase in transactions between reporting dealers and other non-reporting financial institutions, such as non-reporting banks, hedge funds, pension funds and insurance companies (Table B.3). Consequently, the share of this segment increased to 40% from 33%. This growth was broadly based across spot, outright forward and FX swap instruments.

… underpinned by attractive returns for investors, portfolio diversification …

Several factors are likely to have been important for the ongoing strength of turnover growth in this segment.[1] Foreign exchange markets have offered investors with short-term horizons relatively attractive risk-adjusted returns over the three years to April 2007, given that exchange rates were broadly trending and financial market volatility was at historically low levels. In addition, there is evidence that longer-term investors, such as pension funds, have contributed to the increase in turnover by systematically diversifying their portfolios internationally.

[1] For more details, see G Galati and A Heath, "What drives growth in FX activity? Interpreting the 2007 triennial survey", *BIS Quarterly Review*, December 2007.

Geographical distribution of reported foreign exchange market turnover[1]

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

	1998		2001		2004[2]		2007	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Argentina	2	0.1	...	…	1	0.0	1	0.0
Australia	47	2.4	52	3.2	102	4.2	170	4.3
Austria	11	0.6	8	0.5	13	0.5	18	0.4
Bahrain	2	0.1	3	0.2	3	0.1	3	0.1
Belgium	27	1.4	10	0.6	20	0.8	48	1.2
Brazil[3]	5	0.3	5	0.3	3	0.1	5	0.1
Bulgaria	...	…	...	…	...	…	1	0.0
Canada	37	1.9	42	2.6	54	2.2	60	1.5
Chile	1	0.1	2	0.1	2	0.1	4	0.1
China[4]	0	0.0	0	0.0	1	0.0	9	0.2
Colombia	...	…	0	0.0	1	0.0	2	0.0
Czech Republic	5	0.3	2	0.1	2	0.1	5	0.1
Denmark	27	1.4	23	1.4	41	1.7	86	2.2
Estonia	...	…	...	…	0	0.0	1	0.0
Finland	4	0.2	2	0.1	2	0.1	8	0.2
France	72	3.7	48	3.0	64	2.6	120	3.0
Germany	94	4.8	88	5.5	118	4.8	99	2.5
Greece	7	0.4	5	0.3	4	0.2	5	0.1
Hong Kong SAR	79	4.0	67	4.1	102	4.2	175	4.4
Hungary	1	0.1	1	0.0	3	0.1	7	0.2
India	2	0.1	3	0.2	7	0.3	34	0.9
Indonesia	2	0.1	4	0.2	2	0.1	3	0.1
Ireland	10	0.5	8	0.5	7	0.3	11	0.3
Israel	...	…	1	0.1	5	0.2	8	0.2
Italy	28	1.4	17	1.0	20	0.8	36	0.9
Japan	136	6.9	147	9.1	199	8.2	238	6.0
Korea	4	0.2	10	0.6	20	0.8	33	0.8
Latvia	...	…	...	…	2	0.1	3	0.1
Lithuania	...	…	...	…	1	0.0	1	0.0
Luxembourg	22	1.1	13	0.8	14	0.6	43	1.1
Malaysia	1	0.1	1	0.1	2	0.1	3	0.1
Mexico	9	0.5	9	0.5	15	0.6	15	0.4
Netherlands	41	2.1	30	1.9	49	2.0	24	0.6
New Zealand	7	0.4	4	0.2	7	0.3	12	0.3
Norway	9	0.5	13	0.8	14	0.6	32	0.8
Peru	...	…	0	0.0	0	0.0	1	0.0
Philippines	1	0.1	1	0.1	1	0.0	2	0.1
Poland	3	0.2	5	0.3	6	0.3	9	0.2
Portugal	4	0.2	2	0.1	2	0.1	3	0.1
Romania	...	…	...	…	...	…	3	0.1
Russia	7	0.4	10	0.6	30	1.2	50	1.3
Saudi Arabia	2	0.1	2	0.1	2	0.1	4	0.1

For footnotes, see the end of the table.

Geographical distribution of reported foreign exchange market turnover[1] (cont)

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

	1998		2001		2004[2]		2007	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Singapore	139	7.1	101	6.2	125	5.2	231	5.8
Slovakia	...	…	1	0.0	2	0.1	3	0.1
Slovenia	...	…	0	0.0	0	0.0	0	0.0
South Africa	9	0.5	10	0.6	10	0.4	14	0.3
Spain	19	1.0	8	0.5	14	0.6	16	0.4
Sweden	15	0.8	24	1.5	31	1.3	42	1.1
Switzerland	82	4.2	71	4.4	79	3.3	242	6.1
Taiwan, China	5	0.3	4	0.3	8	0.3	15	0.4
Thailand	3	0.2	2	0.1	3	0.1	6	0.2
Turkey	...	…	1	0.1	3	0.1	3	0.1
United Kingdom	637	32.5	504	31.2	753	31.0	1,359	34.1
United States	351	17.9	254	15.7	461	19.2	664	16.6
Total	1,969	100	1,616	100	2,429	100	3,988	100

[1] Adjusted for local double-counting ("net-gross"). [2] Data for 2004 have been revised. [3] For 1998, spot transactions only. [4] For 1998, 2001 and 2004, spot transactions only. Table B.2

… and the spread of electronic trading

The spread of electronic trading platforms has also contributed to turnover in this segment, in part because it has enabled large financial institutions to set up algorithmic trading systems, and has provided trading facilities to retail investors. The share of trade between reporting dealers and non-reporting financial institutions executed through electronic systems varies considerably across countries. In this segment, electronic execution accounts for almost 60% of turnover in Switzerland and around 50% in Australia, Germany and Hong Kong SAR, while the median share is 32%. The median share of electronic execution is 17% for non-financial customers.

Turnover with non-financial customers also more than doubled

Turnover between reporting dealers and non-financial customers also more than doubled between April 2004 and April 2007, but contributed less than one quarter to overall turnover growth. The increase in turnover between

Reported foreign exchange market turnover by counterparty[1]

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

	1998		2001		2004[2]		2007	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Total	1,430	100	1,173	100	1,794	100	3,081	100
with reporting dealers	908	64	688	59	956	53	1,319	43
with other financial institutions	279	20	329	28	585	33	1,235	40
with non-financial customers	242	17	156	13	252	14	527	17
Local	657	46	499	43	695	39	1,185	38
Cross-border	772	54	674	57	1,099	61	1,896	62

[1] Adjusted for local and cross-border double-counting. Excludes estimated gaps in reporting. Due to incomplete counterparty breakdown, components do not always sum to totals. [2] Data for 2004 have been revised. Table B.3

reporting dealers and non-financial customers is likely to be related to the substantial growth in international trade in goods and services between 2004 and 2007, and possibly to an expansion in hedging activity. FX swap turnover with non-financial customers underwent a particularly strong increase and now accounts for 45% of all turnover in this segment, a rise of 10 percentage points. Spot turnover experienced an offsetting fall in share, although it grew in line with aggregate spot turnover.

Consequently, the share of the interbank segment continued to fall

The growth in interbank transactions has been roughly steady over the past six years, and the interbank market contributed almost one third of the growth in aggregate turnover. Despite this, the share of the interbank market in total turnover fell to 43% from 53% over the past three years, largely because the growth in turnover for the other segments was so rapid. Some of the factors identified as drivers of the downward trend in the share of the interbank market in analyses of previous triennial surveys, such as the concentration of the banking sector and the spread of electronic broking platforms, may also have had a dampening effect on interbank turnover, but are not likely to have been as significant as hitherto.[2]

Consolidation in the banking sector is not likely to be as important as in the past

Consolidation of the banking system was identified in the past as reducing turnover in the interbank market through channels such as efficiency gains and the ability to net trades across related parties within an organisation. Although it appears that the banking sector has continued to become more concentrated, the rate at which this is occurring has slowed significantly (Tables B.4 and D.1). In addition, there has been a small increase in the share of related party transactions in total turnover: the median share of related party trades has increased to 8.5% in 2007 from 7.5% in 2004.[3] In general, the share of related party trades is lower in industrialised countries, and the median share of these trades has fallen to 4% from 7% for this group. The main exceptions are Australia and France, where the share of related party trades has increased to 22% and 14% respectively. The share for emerging market economies is generally higher and the median has increased to 14% from 10%.

There is significant variation in the importance of electronic execution

Another factor that has been discussed as an important driver of efficiency gains and the falling share of interbank foreign exchange transactions is the spread of electronic broking platforms. Although it is difficult to assess the impact of changes in execution methods on trading volumes, it is clear that electronic broking systems play a very important role in some interbank markets. For example, for Germany and Switzerland 55% and 44%, respectively, of total interbank transactions are executed through electronic broking platforms. These shares rise to 67% and 58% when electronic trading systems are included in the calculation. However, the median share of transactions executed electronically in the interbank market is significantly

---

[2] See G Galati and M Melvin, "Explaining the surge in FX turnover", *BIS Quarterly Review*, December 2004 and G Galati, "Why has global FX turnover declined? Explaining the 2001 triennial survey", *BIS Quarterly Review*, December 2001.

[3] The median calculations have been done using information on related party trades for countries that report these data for both 2004 and 2007. The general conclusions are not affected by including all economies that report data in a given year.

Concentration in the banking industry

Number of banks accounting for 75% of foreign exchange turnover

	1998	2001	2004	2007
United Kingdom	24	17	16	12
United States	20	13	11	10
Switzerland	7	6	5	3
Japan	19	17	11	9
Singapore	23	18	11	11
Hong Kong SAR	26	14	11	12
Australia	9	10	8	8
France	7	6	6	4
Germany	9	5	4	5
Canada	5–7[1]	4–6[1]	4	6

[1] Depending on the market segment. Table B.4

lower, at 34%, and in some countries, such as Belgium, the share is less than 10% of all interbank trades.

3. Currency composition

Turnover has become more diversified by currency

Over the past three years, the share of turnover accounted for by currency pairs among the US dollar, euro and yen has declined by 6 percentage points (Table B.5). Most of this fall can be explained by the decline in the share of the US dollar/yen pair. The offsetting increase was mainly for transactions involving currencies with relatively low turnover, classified as "other" in Table B.5.

Share of US dollar, euro, yen and sterling has fallen …

The increase in the dispersion of foreign exchange turnover by currency is also apparent in Table B.6. In 2007, the four most traded currencies, the US dollar, the euro, the yen and sterling, are involved in 8 percentage points fewer foreign exchange transactions than they were in 2004. Taking into account the valuation effects arising from the appreciation or deprecation of a currency relative to the US dollar, ie at constant exchange rates, yields a similar conclusion: while the share of the US dollar in total turnover increases, this is offset by larger declines in the shares of the euro and sterling (Table D.3).

… while that of currencies with lower turnover has risen …

Among the currencies with lower levels of turnover, the Hong Kong dollar, the New Zealand dollar, the Swiss franc, the Norwegian krone, the Australian dollar, the Swedish krona, the Polish zloty, the Chinese renminbi and the Indian rupee have all experienced a significant increase in their share of aggregate turnover at current exchange rates. In general, this remains true in constant exchange rate terms, although the share of the Australian dollar rises by 0.3 percentage points rather than by 0.8 percentage points and the share of the Canadian dollar falls by 0.5 percentage points rather than staying steady.

Reported foreign exchange market turnover by currency pair[1]

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

	2001		2004[2]		2007	
	Amount	% share	Amount	% share	Amount	% share
US dollar/euro	354	30	503	28	840	27
US dollar/yen	231	20	298	17	397	13
US dollar/sterling	125	11	248	14	361	12
US dollar/Australian dollar	47	4	98	5	175	6
US dollar/Swiss franc	57	5	78	4	143	5
US dollar/Canadian dollar	50	4	71	4	115	4
US dollar/Swedish krona[3]	…	…	…	…	56	2
US dollar/other	195	17	295	16	572	19
Euro/yen	30	3	51	3	70	2
Euro/sterling	24	2	43	2	64	2
Euro/Swiss franc	12	1	26	1	54	2
Euro/other	21	2	39	2	112	4
Other currency pairs	26	2	42	2	122	4
All currency pairs	1,173	100	1,794	100	3,081	100

[1] Adjusted for local and cross-border double-counting. [2] Data for 2004 have been revised. [3] The US dollar/Swedish krona pair could not be separately identified before 2007 and is included in "other". Table B.5

… partly due to investor interest and more open markets

In some cases, such as the Australian and New Zealand dollars, the increase in turnover is likely to partly reflect greater investor activity in high-yielding currencies between 2004 and 2007. For the Chinese renminbi, the Hong Kong dollar and the Indian rupee, the expansion in turnover is likely to be related to strong economic growth and the increasing depth and openness of domestic financial markets in these economies.

Share of emerging market currencies has increased

More broadly, there appears to have been an increase in the share of emerging market currencies in total turnover: in April 2007, emerging market currencies were involved in almost 20% of all transactions (Table B.6). Emerging market currencies are defined to be the residual when turnover in identified industrialised economy currencies is subtracted from aggregate turnover. This calculation assumes that currencies which are not separately identified[4] are emerging market currencies. To the extent that this assumption does not hold exactly, the shares attributed to emerging market currencies in Table B.6 should be treated as upper bounds.

Methodology changes have improved the accuracy of these estimates …

Based on data provided by countries that report on all industrialised economy currencies, it is likely that the degree of overestimation in 2007 is less than 1 percentage point. The degree of overestimation in previous surveys is likely to be larger given that changes implemented for the 2007 triennial survey have allowed for a more comprehensive reporting of currency breakdowns. In particular, changes to reporting forms have made it possible to report offshore trade in industrialised economy currencies more accurately (see Section D.6). For example, it is estimated that this change increased the share of the

[4] That is, the residual currency reported in Table E.4.

Currency distribution of reported foreign exchange market turnover[1]

Percentage shares of average daily turnover in April 2007

	2001	2004[2]	2007
US dollar	90.3	88.7	86.3
Euro	37.6	36.9	37.0
Yen	22.7	20.2	16.5
Pound sterling	13.2	16.9	15.0
Swiss franc	6.1	6.0	6.8
Australian dollar	4.2	5.9	6.7
Canadian dollar	4.5	4.2	4.2
Swedish krona	2.6	2.3	2.8
Hong Kong dollar	2.3	1.9	2.8
Norwegian krone	1.5	1.4	2.2
New Zealand dollar	0.6	1.0	1.9
Mexican peso	0.9	1.1	1.3
Singapore dollar	1.1	1.0	1.2
Won	0.7	1.2	1.1
Rand	1.0	0.8	0.9
Danish krone	1.2	0.9	0.9
Rouble	0.4	0.7	0.8
Zloty	0.5	0.4	0.8
Indian rupee	0.2	0.3	0.7
Renminbi	0.0	0.1	0.5
New Taiwan dollar	0.3	0.4	0.4
Brazilian real	0.4	0.2	0.4
All currencies	200.0	200.0	200.0
Emerging market currencies[3]	16.9	15.4	19.8

[1] Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%. Adjusted for local and cross-border double-counting. [2] Data for 2004 have been revised. [3] Defined as the residual after accounting for the top eight currencies, the Norwegian krone, the New Zealand dollar and the Danish krone. Table B.6

Australian dollar by around 0.4 percentage points in 2007. This implies that the assumption that the residual currency can be classified as an emerging market currency is correspondingly more approximate in previous surveys.

... but the share of some currencies is still underestimated

The presence of a residual currency also suggests that the importance of some currencies in Table B.6 is significantly underestimated because they have not been separately identified. In some cases, this issue can be partially corrected following a procedure discussed in more detail in Section D.11. Estimates based on this adjustment indicate that the share of the Hong Kong dollar in overall turnover has been underestimated by at least 0.4 percentage points in Table B.6. This correction does not affect the estimates of the share of emerging market currencies insofar as it redistributes this share between two items that are each defined as emerging market currencies for the purposes of this table.

Reported foreign exchange turnover by currency and instrument[1]

Percentage shares of average daily turnover in April

	Spot	Outright forwards	Foreign exchange swaps
US dollar	29.7	10.9	59.4
Euro	36.9	12.1	51.1
Yen	40.4	12.1	47.5
Pound sterling	32.5	10.0	57.4
Swiss franc	42.2	10.1	47.7
Australian dollar	25.7	10.0	64.3
Canadian dollar	29.7	11.8	58.6
Swedish krona	20.7	10.0	69.3
Hong Kong dollar	18.4	7.0	74.6
Norwegian krone	18.4	9.7	71.9
New Zealand dollar	29.4	11.3	59.3
Mexican peso	37.4	11.7	50.9
Singapore dollar	22.5	7.9	69.6
Won	44.7	29.4	25.9
Rand	19.9	12.1	68.0
Danish krone	21.8	10.3	67.9
Rouble	70.7	5.0	24.3
Zloty	20.0	10.9	69.1
Indian rupee	42.6	27.5	29.8
Renminbi	61.4	31.3	7.4
New Taiwan dollar	47.1	40.6	12.3
Brazilian real	50.2	47.3	2.5
Forint	34.1	15.7	50.2
Czech koruna	23.8	20.9	55.3
Baht	18.9	13.3	67.8
Turkish lira	61.4	11.4	27.2
Philippine peso	36.9	32.5	30.5
Rupiah	43.7	39.3	17.0
All currencies	32.6	11.7	55.6

[1] Adjusted for local and cross-border double-counting. Table B.7

Instruments used to trade different currencies vary widely

The results of the latest triennial survey also reveal that the instruments used to trade different currencies vary widely (Table B.7). For some currencies, notably the Chinese renminbi, the Russian rouble and the Turkish lira, over 60% of foreign exchange turnover is accounted for by spot transactions. Although forward transactions account for only 12% of turnover in aggregate, the share of forward transactions exceeds 25% in a number of Asian currencies. Many of these currencies have non-deliverable forward markets because of capital controls. In contrast, the share of turnover accounted for by FX swaps exceeds 70% for the Hong Kong dollar and the Norwegian krone.

C. OTC derivatives markets

In April 2007 the BIS collected OTC derivatives market data on turnover in currency and interest rate products in 54 countries and jurisdictions worldwide. In June data were collected regarding notional amounts outstanding of OTC derivatives from market participants in 47 countries and jurisdictions. As in 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 OTC derivatives market, ie interest rate and currency products; the amounts outstanding, in Tables C.5 to C.7, also refer 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 (sales desk) basis, while amounts outstanding are collected on a consolidated basis. The format of the data on amounts outstanding is the same as that used in the regular semiannual BIS surveys of positions in the global OTC derivatives market. However, while the semiannual survey relies on data provided by major dealers in the G10 countries and Switzerland, the triennial survey covers a much larger set of market participants. In addition, it contains information on instruments not covered by the semiannual survey, in particular credit derivatives other than credit default swaps (CDSs).

1. Turnover data

Rapid growth in turnover …

Activity in the OTC derivatives market continued to expand at a rapid pace between 2004 and 2007. Average daily turnover in OTC foreign exchange and interest rate contracts went up by 73%, to $4.2 trillion in April 2007 (Table C.1). This corresponds to an annual compound rate of growth of 20%, which is above the mean increase of 14% recorded since the derivatives part of the triennial survey was started in 1995.

While volumes converted into US dollars increased at the same rate as in the previous three years, less of the growth in the more recent period can be attributed to movements in exchange rates than between 2001 and 2004. Turnover converted into US dollars at constant 2007 exchange rates increased by 50% between 2001 and 2004, and by 65% in the more recent period. This suggests that the structural growth of the market has, if anything, accelerated during the past three years.

… in both market segments

Differences in turnover growth between the two market segments were small compared to previous surveys. Activity in foreign exchange derivatives (including outright forwards and FX swaps, which are discussed in Section B on the traditional foreign exchange market) rose by 78%, slightly higher than the rate of increase reported for the spot market (59%). More moderate growth was recorded in the interest rate segment, where turnover went up by 64%.

Global OTC derivatives market turnover[1]

Daily averages in April, in billions of US dollars

	1998	2001	2004[2]	2007
Foreign exchange turnover	959	853	1,303	2,319
Outright forwards and foreign exchange swaps	862	786	1,163	2,076
Currency swaps	10	7	21	32
Options	87	60	117	212
Other	0	0	2	0
Interest rate turnover[3]	265	489	1,025	1,686
FRAs	74	129	233	258
Swaps	155	331	621	1,210
Options	36	29	171	215
Other	0	0	0	1
Estimated gap in reporting	39	43	92	193
Total[4]	1,265	1,385	2,420	4,198
Memo: Turnover at April 2007 exchange rates[5]	*1,410*	*1,700*	*2,550*	*4,198*
Exchange-traded derivatives[6]	*1,382*	*2,198*	*4,547*	*6,173*
Currency instruments	*11*	*10*	*22*	*72*
Interest rate instruments	*1,371*	*2,188*	*4,524*	*6,101*

[1] Adjusted for local and cross-border double-counting. [2] Data for 2004 have been revised. [3] Single currency interest rate contracts only. [4] Including estimates for gaps in reporting. [5] Non-US dollar legs of foreign currency transactions were converted into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2007 exchange rates. [6] Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Reported monthly data were converted into daily averages of 20.5 days in 1998, 19.5 days in 2001, 20.5 in 2004 and 20 in 2007.

Table C.1

For the first time since 1995, growth in turnover in the OTC market outstripped that in exchange-traded interest rate and currency derivatives (36%). As a consequence, the ratio of OTC turnover to that in listed contracts rebounded to 0.7, from a low of 0.5 recorded in April 2004. However, it remained far below the level of around 1.5 seen in the first survey in 1995. The narrowing of the gap between the two markets resulted from comparatively low growth in exchange-traded interest rate contracts (35%). Turnover in listed FX derivatives went up by 222%, far outstripping growth in the OTC market, but at less than $0.1 trillion it was dwarfed by the interest rate segment of the international derivatives exchanges.

Foreign exchange derivatives

Accelerating growth in FX contracts

Growth in the FX segment of the OTC derivatives market accelerated since 2004 and, for the first time since the BIS began to survey the market, outstripped growth in the interest rate segment. In April 2007, currency contracts accounted for 58% of aggregate turnover, which was slightly higher than the 56% recorded in 2004. In 1995, turnover in foreign exchange contracts exceeded volumes in interest rate derivatives by a factor of 4.5, but this dropped in subsequent surveys.

FX derivatives market dominated by forwards and FX swaps

Activity in the foreign exchange segment of the OTC derivatives market continued to be dominated by traditional instruments such as outright forwards and FX swaps (Graph C.1), which are discussed in Section B of this report. With an average daily turnover of $2.1 trillion, these relatively simple instruments accounted for 90% of turnover in FX derivatives, virtually unchanged from 2004. Among the non-traditional, more complex, products, turnover in currency options increased by 81% to $0.2 trillion, or 9% of the total FX segment. Volumes of currency swaps, which involve the exchange of recurring interest payments denominated in different currencies, increased by 49% to $0.03 trillion.

Leading role of US dollar ...

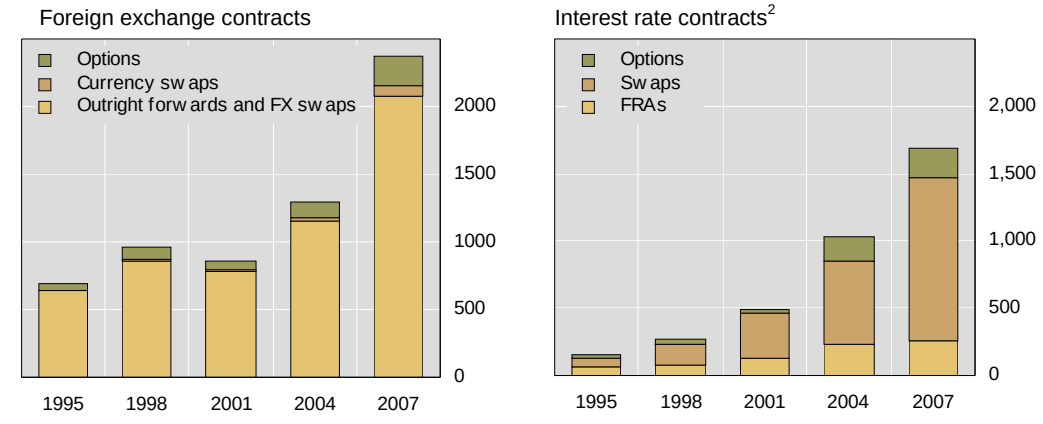
The US dollar maintained its role as the leading currency in the FX derivatives market, with the euro a distant second. Across all contracts, 89% had one leg denominated in US dollars, and 35% in euros (Table C.2). Only 3% of all transactions in FX derivatives did not involve either the euro or the dollar, underlining their importance as vehicle currencies.

... not challenged by euro

Expectations that the euro might challenge the US dollar's dominance in the FX market have not been borne out. While dollar/euro remained the most important currency pair traded, accounting for 27% of total turnover measured in notional amounts, only 8% of all trades involved the euro and a currency other than the dollar. Furthermore, even derivatives on European currencies were traded predominantly against the dollar. For example, turnover in contracts denominated in Swiss francs or Swedish kronor on one side, and the dollar on the other, exceeded turnover in these two currencies vis-à-vis the euro by a factor of 3.5. Only options on these two currencies were more traded against the euro than against the dollar. For other currencies, the discrepancy between turnover against the dollar and against the euro was even larger. For instance, turnover in derivatives on yen/dollar or sterling/dollar was more than seven times higher than activity in yen/euro or sterling/euro.

Turnover in OTC derivatives markets

In billions of US dollars[1]



[1] All figures are adjusted for double-counting. [2] Single currency contracts only. Graph C.1

Reported foreign exchange turnover in OTC derivatives markets by currency pair[1]

Daily averages in April, in billions of US dollars

	Total[2]			Of which					
				Options			Currency swaps		
	April 2001	April 2004[3]	April 2007	April 2001	April 2004[3]	April 2007	April 2001	April 2004	April 2007
US dollar vs other currencies	787	1,165	2,055	48	92	158	6	18	27
Euro	256	345	627	16	31	43	1	7	8
Japanese yen	169	223	298	17	27	38	2	3	3
Pound sterling	101	196	282	3	9	19	1	3	4
Swiss franc	41	60	101	2	3	6	0	1	1
Canadian dollar	38	55	93	3	6	9	0	0	2
Australian dollar	38	78	147	3	8	9	0	1	1
Swedish krona[4]	…	…	51	…	…	0	…	…	1
Other	143	208	457	3	10	32	1	2	8
Euro vs other currencies[5]	47	104	185	10	20	37	1	3	3
Japanese yen	18	38	42	6	10	16	0	0	0
Pound sterling	14	29	40	2	3	4	0	2	1
Swiss franc	5	13	29	1	4	8	0	0	0
Canadian dollar	1	2	5	0	0	0	0	0	0
Australian dollar	1	3	5	0	1	1	0	0	0
Swedish krona[4]	…	…	15	…	…	2	…	…	0
Other	8	20	49	1	3	7	0	...	1
Japanese yen vs other currencies[6]	3	10	27	0	1	6	0	0	0
Other currency pairs	15	24	53	2	4	10	0	0	1
All currency pairs	853	1,303	2,319	60	117	212	7	21	32

[1] Adjusted for local and cross-border double-counting. [2] Outright forwards, foreign exchange swaps, currency swaps, options and other products. [3] Data for 2004 have been revised. [4] The currency pairs US dollar/Swedish krona and euro/Swedish krona could not be separately identified before 2007, and are included in "other". [5] Excluding the US dollar. [6] Excluding the US dollar and the euro.

Table C.2

Interest rate derivatives

Sharp growth in interest rate contracts in second-tier currencies

Both the currency composition and the instrument breakdown were very different in the interest rate segment of the OTC derivatives market compared to the FX segment. For example, turnover in euro-denominated contracts was larger than activity in US dollar contracts, although the gap has narrowed since the previous survey. In the reporting period, 39% of turnover took place in euro-denominated contracts, and 32% in dollars (Table C.3). While the dollar and the euro clearly dominated activity in OTC interest rate derivatives, their combined share has fallen by nearly 10 percentage points since the 2004 survey, as turnover growth in several non-core markets outstripped that in the two leading currencies. For example, average daily trading volumes of sterling-denominated interest rate derivatives increased by 91%, compared to rates of growth of 42% and 53%, respectively, in the euro and the dollar. Turnover in contracts denominated in yen almost tripled, bringing the Japanese currency's share in total turnover to over 8%, from 4.5% three years before. To some

extent, rapid growth in the yen market reflected a catching-up since for many years activity in that market had been hampered by extremely low and stable interest rates.

Importance of interest rate swaps

Outright forwards play a much smaller role in the interest rate than in the FX segment, and their relative importance has declined over the years (Graph C.1). Turnover in forward rate agreements (FRAs), where market participants contract an interest rate for a set period of time in the future, went up by a comparatively modest 11% (Table C.3), bringing their share in total turnover in the rates segment to 15%, compared to 72% for single currency interest rate swaps, and 13% for interest rate options. In 2004, the share of FRAs was 23%. The relative loss of importance of these instruments was mainly related to a fall in the turnover of euro-denominated forwards (–43%). While this is in line with anecdotal evidence that these instruments lost some of their importance as a tool to trade short-term interest rate risk to overnight interest rate swaps, the extent of the decline is quite large. One explanation could be the relative paucity of news on euro area monetary policy during the reporting month. Turnover in FRAs held up much more strongly in the US dollar (66%) and sterling (68%) markets.

The high share of the euro was related mainly to the importance of the euro swap market, where turnover grew by 83% to $0.5 trillion. This compares to an average daily turnover of $0.3 trillion in US dollar-denominated interest rate swaps. The prominent role in the euro interest rate market for swaps was probably related to the fragmentation of the euro area government bond market between various issuers, none of which even comes close to the United States in terms of amounts outstanding along the entire maturity spectrum. This fragmentation makes it more costly to trade interest rate risk in the spot market, causing market participants to rely on swaps instead.

Reported interest rate turnover in OTC derivatives markets by currency[1]

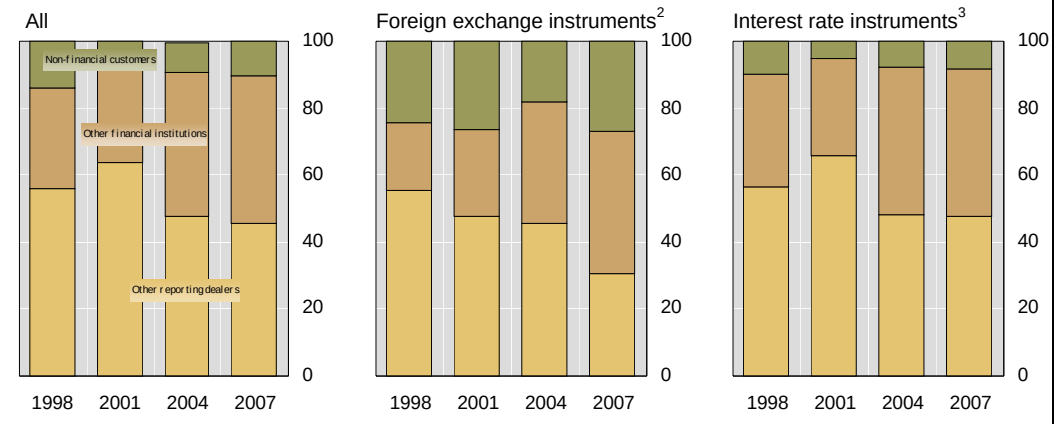
Daily averages in April, in billions of US dollars

	Total			Of which					
				FRAs			Swaps		
	April 2001	April 2004	April 2007	April 2001	April 2004	April 2007	April 2001	April 2004	April 2007
US dollar	152	347	532	39	59	98	100	195	322
Euro	231	461	656	48	116	66	173	288	528
Japanese yen	27	46	137	9	0	4	16	35	110
Pound sterling	37	90	172	12	25	42	23	59	124
Swiss franc	6	10	19	2	2	4	4	7	14
Canadian dollar	6	8	15	1	2	1	4	5	12
Australian dollar	8	12	19	4	5	3	4	7	14
Swedish krona	5	13	33	4	9	18	1	4	13
Other	17	38	103	10	15	22	6	21	74
Total turnover	489	1,025	1,686	129	233	258	331	621	1,210

[1] Adjusted for local and cross-border double-counting. Single currency contracts only. Table C.3

Reported turnover in OTC derivatives markets by counterparty[1]

In per cent



[1] Adjusted for local and cross-border double-counting. Excluding outright forwards and foreign exchange swaps. [2] Currency swaps and options. [3] Single currency interest rate contracts only. Graph C.2

Types of counterparties

Share of inter-dealer trading fell in FX segment …

Growth in non-traditional FX contracts such as FX options and currency swaps was driven by activity involving financial institutions other than reporting dealers or non-financial customers to an even larger extent than trading in the traditional FX market (see Section B). As a consequence, the share of inter-dealer transactions in total turnover of non-traditional instruments dropped from 46% in 2004 to only 30% in 2007 (Graph C.2), whereas the shares of transactions with non-reporting financial institutions and with non-financial customers went up to 43% and 27%, respectively.

… but was stable in interest rate market

A very different pattern was observed in the market for OTC interest rate derivatives, where the shares of the different types of counterparties have remained stable since the 2004 survey. Transactions between dealers accounted for just under half of total turnover in OTC interest rate derivatives, well above the corresponding figure for the FX segment. By contrast, non-financial customers were involved in less than 10% of all trades.

Geographical distribution

OTC trading concentrated in a few centres …

Turnover in OTC derivatives was more concentrated in a small number of financial centres than trading in the FX spot market. Fifty-nine per cent of total turnover took place in only two countries (Table C.4), compared to just over half in the "traditional" FX market. On the other hand, turnover in exchange-traded derivatives was even more concentrated than volumes in the OTC derivatives markets, with the two leading countries accounting for 81% of worldwide turnover in financial contracts (excluding options on single stocks).

… primarily London and New York

The survey confirms London's role as the largest international centre for OTC derivatives trading. UK-based sales desks, most of which were probably located in London, executed 44% of all interest rate and 39% of all FX contracts worldwide. For the United States, the corresponding figures were

Geographical distribution of reported OTC derivatives market activity[1]

Average daily turnover, in billions of US dollars

	Total			Foreign exchange[2]			Interest rate[3]		
	2001	2004[4]	2007	2001	2004[4]	2007	2001	2004	2007
Argentina	…	…	0	…	…	0	…	…	...
Australia	51	84	155	41	71	132	10	13	23
Austria	8	23	18	4	9	13	4	14	5
Bahrain	2	1	2	2	1	2	0	0	0
Belgium	22	45	57	8	14	35	14	31	22
Brazil	2	2	1	2	1	1	0	1	0
Bulgaria	…	…	0	…	…	0	…	…	0
Canada	43	53	71	33	41	50	10	12	21
Chile	1	1	2	1	1	2	0	0	0
China	…	…	1	…	…	1	…	…	...
Colombia	0	0	1	0	0	1	0	…	0
Czech Republic	1	2	4	1	1	4	0	1	1
Denmark	25	44	83	20	33	73	6	11	10
Estonia	…	0	1	…	0	1	…	…	0
Finland	2	1	11	1	1	8	1	0	3
France	106	205	278	41	54	102	65	151	176
Germany	159	127	167	65	85	77	94	43	90
Greece	3	3	4	3	3	4	0	0	0
Hong Kong SAR	52	82	160	49	70	143	3	11	17
Hungary	0	2	5	0	2	5	0	0	1
India	2	4	27	2	3	24	0	1	3
Indonesia	1	1	1	1	1	1	0	0	0
Ireland	11	15	15	5	3	7	6	12	7
Israel	0	2	5	0	2	5	0	…	...
Italy	36	53	56	12	15	26	24	38	30
Japan	132	185	226	116	154	149	16	31	76
Korea	4	11	23	4	10	18	0	1	5
Latvia	…	1	2	…	1	2	…	…	...
Lithuania	…	0	0	…	0	0	…	0	0
Luxembourg	13	19	34	9	11	31	5	7	3
Malaysia	1	1	2	1	1	2	0	0	0
Mexico	5	6	14	4	5	11	0	1	3
Netherlands	49	61	49	25	42	22	24	19	27
New Zealand	3	7	14	3	6	11	0	1	3
Norway	12	17	35	10	12	29	3	5	7
Peru	0	0	0	0	0	0	0	…	0
Philippines	1	0	1	1	0	1	0	0	0
Poland	4	6	10	3	5	7	1	1	3
Portugal	1	2	4	1	1	3	0	1	1
Romania	…	…	2	…	…	2	…	…	0
Russia	0	6	16	0	6	16	0	…	...
Saudi Arabia	1	1	2	1	1	2	0	0	0

For footnotes, see the end of the table.

Geographical distribution of reported OTC derivatives market activity[1] (cont)

Average daily turnover, in billions of US dollars

	Total			Foreign exchange[2]			Interest rate[3]		
	2001	2004[4]	2007	2001	2004[4]	2007	2001	2004	2007
Singapore	73	100	210	69	91	153	3	9	57
Slovakia	1	1	3	1	1	3	0	…	...
Slovenia	0	0	0	0	0	0	0	…	0
South Africa	8	11	15	8	8	11	1	3	4
Spain	26	22	28	6	10	11	20	12	17
Sweden	22	32	48	19	25	36	3	7	12
Switzerland	63	74	206	53	62	145	10	12	61
Taiwan, China	2	6	8	2	5	7	0	2	1
Thailand	1	2	5	1	2	5	0	0	0
Turkey	1	2	3	1	2	3	0	0	0
United Kingdom	628	1,176	2,105	390	613	1,148	238	563	957
United States	285	599	959	169	281	434	116	317	525
Total	1,862	3,098	5,149	1,186	1,769	2,976	676	1,331	2,173

[1] Adjusted for local double-counting ("net-gross"). [2] Including outright forwards and foreign exchange swaps. [3] Single currency contracts only. [4] Data for 2004 have been revised. Table C.4

24% (interest rates) and 15% (FX). The international role of the United Kingdom was underlined by the fact that most transactions did not involve the domestic currency. Only about 21% of all trades in FX derivatives had one leg denominated in pound sterling. Similarly, only 18% of turnover in single currency interest rate contracts was in pound sterling, compared to 51% in euro. By contrast, activity in the United States reflected the pre-eminent role of the US dollar in global financial markets, with transactions denominated in other currencies playing only a subordinate role. For example, only 15% of transactions in FX contracts traded in the United States did not have a dollar leg, and only 12% of US turnover in interest rate contracts was denominated in a currency other than the dollar. Outside the United Kingdom and the United States, most trades took place in Europe (18%, down from 22% in the previous survey) and the Asia-Pacific region (stable at 13%). OTC derivatives are also traded in some Latin American countries and in South Africa, but volumes remained negligible relative to those recorded in the other regions.

2. Notional amounts outstanding

Growth in open positions outstripped that in turnover

Positions in OTC derivatives grew at an even more rapid pace than turnover. Notional amounts outstanding went up by 135% to $516 trillion at the end of June 2007 (Table C.5). This corresponds to an annualised compound rate of growth of 33%, which is higher than the approximately 25% average annual rate of increase since the current format of the triennial survey was established in 1998.[1]

[1] Notional amounts outstanding in the 1995 survey are not comparable since the data were collected on a non-consolidated basis and for FX and interest rate contracts only.

Global positions in OTC derivatives markets by type of instrument[1]

Amounts outstanding, in billions of US dollars

	Positions at end-June 2004			Positions at end-June 2007		
	Notional amounts	Gross market values	%[2]	Notional amounts	Gross market values	%[2]
Foreign exchange contracts	31,500	1,116	3.5	57,597	1,611	2.8
Outright forwards and FX swaps	16,764	461	2.8	29,771	667	2.2
Currency swaps	7,939	506	6.4	14,127	665	4.7
Options	6,789	149	2.2	13,662	278	2.0
Other	8	0	0	37	0	0
Memo: Exchange-traded currency contracts[3]	*98*	…	…	*303*	…	…
Interest rate contracts[4]	177,457	4,582	2.6	388,627	6,724	1.7
FRAs	14,399	211	1.5	25,607	145	0.6
IR swaps	137,277	3,978	2.9	306,438	5,813	1.9
Options	25,757	393	1.5	56,575	766	1.4
Other	25	0	0	7	0	0
Memo: Exchange-traded currency contracts[3]	*49,385*	…	…	*86,135*	…	…
Equity-linked contracts	5,094	321	6.3	10,760	1,213	11.3
Forwards and swaps	773	72	9.3	3,426	266	7.8
Options	4,321	249	5.8	7,333	947	12.9
Memo: Exchange-traded currency contracts[3]	*3,348*	…	…	*10,246*	…	…
Commodity contracts	1,354	176	13.0	8,255	690	8.4
Gold	359	46	12.8	1,051	56	5.3
Other	995	130	13.1	7,204	634	8.8
Forwards and swaps	541	...	…	3,481	...	…
Options	453	...	…	3,724	...	…
Credit derivatives	4,474	131	2.9	51,095	906	1.8
Forwards and swaps	3,842	...	...	49,974	...	...
Credit default swaps	...	...	…	45,179	768	1.7
Single name	...	...	…	25,104	430	1.7
Multi-name	...	...	…	20,075	338	1.7
Options	631	...	...	1,121	...	...
Other derivatives	191	65	34.0	78	1	1.7
Forwards and swaps	139	...	…	73	...	…
Options	52	...	…	6	...	…
Total contracts	220,070	6,391	2.9	516,411	11,145	2.2

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

Table C.5

Highest growth in the credit segment

Growth accelerated in all risk categories. The highest rate of increase was reported in the credit segment of the OTC derivatives market, where positions expanded to $51 trillion, from under $5 trillion in the 2004 survey. Notional amounts outstanding of commodity derivatives rose more than sixfold to

$8 trillion, although this may reflect a change in the degree of underreporting as well as a genuine increase in positions (see below). Less extreme, but still high rates of growth were reported for the more traditional types of risk traded on the OTC derivatives market. Open positions in interest rate contracts increased by 119% to $389 trillion, and those in equity contracts by 111% to $11 trillion. Growth in notional amounts outstanding of OTC foreign exchange derivatives was less brisk at 83%, taking the volume of open positions in such contracts to $58 trillion.

Gross market values rose by a smaller amount …

Notional amounts outstanding provide useful information on the structure of the OTC derivatives market but should not be interpreted as a measure of the riskiness of these positions. While a single comprehensive measure of risk does not exist, a useful concept is the cost of replacing all open contracts at the prevailing market prices. This measure, called gross market value, increased at a considerably lower rate (74%) than notional amounts during the reporting period, to $11 trillion at the end of June.[2]

… due to stable long-term interest rates and implied volatility

Discrepancies between growth in notional amounts and in gross market values have also been recorded in previous surveys. As a consequence, the ratio of market values to notional amounts fell to 2.2%, from 3.1% in 2001. One reason why the replacement values of derivatives positions increased at a lower rate than face values is that long-term government bond yields in the major currencies, which are the main driver of the market value of interest rate swaps, on balance changed by only very small amounts between mid-2004 and mid-2007. Since interest rate swaps, similar to most other derivatives contracts other than options, tend to be priced such that their initial value is zero, stable long-term rates are usually associated with low replacement values. Implied volatilities, an important input for the market value of options, also remained stable at a low level between the 2004 and the 2007 surveys. By contrast, stock prices rose sharply in most regions, which is consistent with the fact that the replacement value of equity contracts increased at a much faster rate (278%) than notional amounts (111%).

Interest rate derivatives

Dominant role of interest rate segment

Positions in OTC derivatives are dominated by interest rate contracts, which accounted for 75% of total notional amounts and 60% of total gross market values, well above their share in turnover. This discrepancy can be explained by the often rather long maturities of these contracts. For example, only 38% of all OTC fixed income contracts recorded by the BIS have a residual maturity of one year or less, whereas 27% expire in more than five years (Table C.6), compared to 76% and 7% in the FX segment (Table C.7). One unit of turnover in the interest rate market will therefore be associated with a much larger size of open positions than the same unit traded in the average foreign exchange contract.

---

[2] Gross credit exposures, after taking into account enforceable netting arrangements, of the 55 dealers reporting to the regular OTC derivatives statistics stood at $2.7 trillion at end-June 2007 (see http://www.bis.org/statistics/derstats.htm).

Global positions in OTC interest rate derivatives markets[1]

Amounts outstanding, in billions of US dollars

	Total[2]			Of which					
				Forwards and swaps[3]			Options		
	April 2001	April 2004	April 2007	April 2001	April 2004	April 2007	April 2001	April 2004	April 2007
Total	**75,813**	**177,458**	**388,627**	**64,898**	**151,676**	**332,045**	**10,913**	**25,757**	**56,575**
By currency									
US dollar	25,666	61,451	123,742	20,278	49,852	97,139	5,389	11,600	26,603
Euro	24,556	66,570	146,906	21,098	56,421	125,183	3,458	10,149	21,723
Yen	11,913	21,900	48,881	11,116	20,158	44,804	796	1,742	4,077
Pound sterling	6,052	13,149	30,786	5,224	11,645	28,407	829	1,504	2,379
Swiss franc	1,303	2,920	4,197	1,262	2,694	4,009	41	225	188
Canadian dollar	991	1,737	3,530	869	1,588	3,263	121	150	267
Australian dollar	786	1,298	2,693	697	1,251	2,579	88	46	114
Swedish krona	1,199	1,897	6,557	1,160	1,848	6,315	39	49	242
Other	3,347	6,536	21,335	3,194	6,220	20,345	152	291	983
By maturity[4]									
One year or less	29,160	61,909	145,980	26,435	53,499	128,131	2,725	8,410	17,849
Over 1 year and up to 5 years	29,470	71,275	138,371	24,001	60,404	114,685	5,469	10,871	23,686
Over 5 years	17,184	44,241	105,380	14,465	37,765	90,211	2,719	6,476	15,169

[1] Single currency contracts adjusted for inter-dealer double-counting. [2] Including "other" instruments. [3] Forward rate agreements and interest rate swaps. [4] Due to incomplete maturity breakdown, components do not always sum to totals. Table C.6

Positions in OTC and exchange-traded contracts are hard to compare

Positions in OTC interest rate derivatives grew at a faster pace (119%) than positions in listed interest rate futures and options (74%). At first glance, the $389 trillion notional amounts outstanding in the OTC segment also appear far larger than open positions in listed futures and options ($86 trillion). In part, this discrepancy could be due to the shorter maturity of exchange-traded contracts. In general, however, such a simple comparison ignores the fact that the OTC data refer to gross positions, whereas the data on positions in exchange-traded contracts are netted. OTC derivatives are contracts between two parties, not assets that can be sold off freely; terminating these contracts therefore requires the consent of all counterparties. Traders often exit positions by entering a second contract that offsets the original exposure to eliminate the market (but not counterparty) risk of a position. Notional amounts outstanding double in consequence, even though the effective market risk position has dropped to zero. This practice introduces a sort of "piling-up" of contracts, leading to high notional amounts relative to the underlying exposures to market risk. By contrast, purchases and sales of exchange-traded derivatives are fully netted. Staying with the above example, buying a futures contract today and selling it tomorrow would result in zero open interest. As a result, a comparison of notional amounts outstanding in the OTC market and on organised exchanges will be biased in favour of the former. To a certain extent, this may also apply to growth rates.

There is cause to believe that a higher amount of netting following the extension of central counterparty services to OTC derivatives markets and the introduction of multilateral termination services has reduced the importance of "piling-up" of contracts in recent years. One reason is the increased amount of netting caused by the growth in central counterparty and multilateral netting services. Between June 2004 and June 2007, SwapClear, the most important central counterparty in the OTC interest rate segment, cleared interest rate swaps with notional amounts totalling $41 trillion, compared to $16 trillion in the previous three years. Multilateral terminations of interest rate swaps reached $13 trillion over the same period.[3]

The prominent role of the euro in the OTC interest rate derivatives market that was discussed in the turnover section is also apparent in the amounts outstanding. Euro-denominated contracts accounted for 38% of notional amounts outstanding, and contracts in US dollars for 32%, which is in line with their respective shares in turnover.

Foreign exchange contracts

Lower growth in FX segment

Growth in the positions of OTC foreign exchange derivatives lagged that in other segments of the OTC derivatives market. Notional amounts outstanding of currency instruments increased by 83% to $58 trillion at the end of June 2007 (Table C.7). As a consequence, the share of foreign exchange contracts in the overall OTC derivatives market fell to 11%, from 14% three years ago and from about 30% in 1998.

The instrument breakdown for notional amounts outstanding of FX derivatives was very different to that for turnover, reflecting the very dissimilar maturities of the various types of contracts. For example, outright forwards and FX swaps, which tend to have comparatively short maturities (Section B), accounted for a considerably smaller share of open positions (52%) than of turnover (90%). By contrast, currency swaps, which tend to have much longer maturities than forwards or FX swaps, had a share of 25% in notional amounts outstanding and only 1.5% in turnover.[4]

Credit derivatives

Soaring positions in credit derivatives

Positions in credit derivatives stood at $51 trillion at end-June 2007, compared to $4.5 trillion in the 2004 survey (Table C.5). The very high rate of growth recorded in this period reflects the relatively newness of these instruments. The survey results show that the share of transactions with reporting dealers was higher in credit derivatives than in other OTC segments. In part, this may

[3] The private firm TriOptima has been offering multilateral termination services to OTC derivatives dealers since the beginning of 2003, initially for interest rate swaps and later also for credit default swaps. A termination cycle consists of two steps. Dealers first provide TriOptima with contract-by-contract information on their derivatives positions. TriOptima then checks whether each individual contract is reported by both counterparties with identical terms. In a second step, TriOptima identifies the contracts that can be terminated without a material impact on net exposures.

[4] Precise data on the maturity breakdown of these instruments are not available since, in the reporting template for the maturity breakdown, currency swaps, outright forwards and FX swaps are grouped under the same heading.

Global positions in OTC foreign exchange markets[1]

Amounts outstanding, in billions of US dollars

	Total[2]			Of which					
				Forwards and swaps[3]			Options		
	April 2001	April 2004	April 2007	April 2001	April 2004	April 2007	April 2001	April 2004	April 2007
Total	**20,435**	**31,500**	**57,597**	**17,577**	**24,702**	**43,898**	**2,824**	**6,789**	**13,662**
By currency									
US dollar	18,341	28,402	47,793	15,977	22,024	37,418	2,364	6,378	10,376
Euro	7,325	11,726	21,355	6,181	9,248	16,204	1,144	2,478	5,151
Yen	4,888	7,265	12,155	3,918	5,178	7,106	970	2,088	5,048
Pound sterling	2,912	5,078	8,931	2,553	4,013	7,700	359	1,065	1,232
Swiss franc	996	1,590	3,451	869	1,276	2,424	127	313	1,027
Canadian dollar	885	1,261	2,604	789	1,044	2,183	96	217	421
Australian dollar	762	1,583	3,056	588	1,169	2,344	174	414	712
Swedish krona	561	877	1,601	533	790	1,434	29	88	167
Other	4,199	5,216	14,246	3,746	4,663	10,984	386	538	3,189
By maturity[4]									
One year or less	15,906	24,706	43,838	10,848	18,618	33,233	2,456	6,089	10,605
Over 1 year and up to 5 years	3,293	4,712	9,783	2,543	4,114	7,080	321	598	2,702
Over 5 years	1,206	2,067	4,216	1,022	1,966	3,842	47	101	375

[1] Adjusted for inter-dealer double-counting. [2] Including "other" instruments. Counting both currency sides of every foreign exchange transaction means that the currency breakdown sums to 200% of the aggregate. [3] Outright forwards, foreign exchange swaps and currency swaps. [4] Due to incomplete maturity breakdown, components do not always sum to totals. Table C.7

be the result of novations, which involve the transfer of trades to a third party. Novations are routinely used by hedge funds, which are not reporting dealers in the framework of the survey, to exit positions in OTC derivatives, in particular in credit instruments.[5] Some dealers estimate that roughly 25% of their credit derivatives transactions involve novation.[6] As a consequence trades initiated by hedge funds might end up as transactions between two dealers.

CDSs were by far the dominant instrument in this category, accounting for 88% of positions in credit derivatives. Within the CDS category, single-name instruments represent approximately three fifths of open positions, and multi-name contracts for the remainder[7].

[5] Novation means that the contract between the buyer and the seller is replaced by separate contracts between these two parties and a third party. It is also referred to as "assignment" or "give-up". Novations allow parties wishing to exit a contract to seek quotes from several dealers, thus putting them in a stronger bargaining position than when accepting the quotes of their initial counterparty for the termination of a contract

[6] Committee on Payment and Settlement Systems, New developments in clearing and settlement arrangements for OTC derivatives, March 2007

[7] More detailed data on CDS markets are analysed in the context of the Semiannual OTC derivatives statistics available under http://www.bis.org/statistics/derstats.htm

Equity derivatives

Brisk growth in equity contracts

A sharp increase in the volume of forwards and swaps drove up volumes in the equity segment of the OTC derivatives market. Notional amounts outstanding of OTC equity derivatives more than doubled to $11 trillion at the end of June. Positions in equity forwards and swaps soared by 343% to over $3 trillion, while the volume of options increased by 70% to $7 trillion.

Commodity derivatives

Very high growth in commodity segment possibly distorted by reporting problems

The survey showed very rapid growth in the volume of outstanding commodity derivatives, whose notional amounts increased sixfold to $8 trillion at end-June 2007. This is consistent with reports of a surge in investor interest in commodity investments, triggered by soaring commodity prices in recent years. However, part of the increase could also be the result of improved coverage by the survey. Many market participants seem to have processed commodity derivatives in systems that were not fully integrated with those used to process financial derivatives, which could have introduced a downward bias in past surveys. Systems appear to have become more integrated in recent years, which could have reduced the bias and contributed to the extremely high rates of growth in that segment.[8]

The relative importance of OTC derivatives on gold has diminished since the 2004 survey. In mid-2007, contracts on gold accounted for 13% of notional amounts outstanding of all commodity derivatives, down from 27% in 2004 and 41% in 2001. While this could be related to the measurement problems described above, it is also in line with evidence that several large producers have reduced the size of their hedging positions.

[8] Data on the commodity segment could also be distorted by the absence of specialised commodity dealers in the set of respondents.

D. Methodology

This section contains a description of the methodology, general definitions, classification principles and compilation procedures for the most recent Triennial Central Bank Survey on Foreign Exchange and Derivatives Market Activity carried out by central banks and monetary authorities in 54[1] countries in April and at end-June 2007.[2] The objective of the exercise is to obtain comprehensive and internationally consistent information on the size and structure of foreign exchange and over-the-counter (OTC) derivatives markets in order to increase market transparency and help monetary authorities and market participants to better monitor patterns of activity in the global financial system.

Two main statistical frameworks are implemented by the BIS for the collection of foreign exchange and derivatives statistics: the triennial survey and the semiannual OTC derivatives market statistics.[3] The triennial survey covers data not only on turnover in foreign exchange and OTC derivatives markets in April 2007, but also on OTC derivatives amounts outstanding at end-June 2007. These data on positions at end-June 2007 are complemented by the semiannual OTC derivatives statistics, which follow the same methodology and are reported by the main dealers in the G10 countries.

- Around 1,260 market participants in 54 countries participated in the first part of the triennial exercise, providing foreign exchange spot and foreign exchange and OTC interest rate derivatives turnover in April 2007. The basis for reporting was the location of the deal (sales desk basis). In-house deals and deals with other offices of the same institution were included in the report.
- Around 400 dealers in non-G10 countries and non-regular reporters[4] in seven G10 countries provided aggregate amounts outstanding and gross market values at end-June 2007. Unlike the turnover part of the triennial survey, amounts outstanding were reported on a worldwide consolidated basis, ie including domestic and foreign branches and subsidiaries, with positions between offices of the same reporting institution being netted out.

---

[1] With Bulgaria and Romania participating for the first time.

[2] Preliminary results of the turnover and amounts outstanding parts were released in September and November 2007 respectively.

[3] Detailed results of the semiannual OTC derivatives statistics as of 1998 are available from the BIS website under http://www.bis.org/statistics/derstats.htm.

[4] Institutions not participating in the semiannual OTC derivatives statistics.

- At end-June 2007, 55 major dealers participated in the semiannual OTC exercise. In addition, they were asked to provide supplementary information on credit derivatives in the context of the triennial survey.

The figures presented in this report are fairly comparable with those of the previous triennial survey in 2004. Overall, general definitions and compilation procedures remained consistent with the ones applied in 2004. However, in order to facilitate the reporting procedures and improve the identification of particular data segments, the following modifications were included as compared with the 2004 survey:

- The definition of related party (in-house) deals was further clarified in order to improve consistency of data reporting (see Section 2.1);
- Additional currencies were identified in the reporting templates in order to facilitate reporting and allow better coverage of all participating countries' currencies (see Section 6);
- The reporting template for electronic trading and identification of execution method was simplified and adjusted in order to better distinguish between categories (see Section 9);
- Finally, the amounts outstanding part was expanded to cover statistics on credit default swaps (CDSs) following the inclusion of CDS statistics in the BIS semiannual OTC derivatives statistics reported by G10 countries (see Section 8).

1. Coverage and basic features of the 2007 survey

Around 1,260 market participants in 54 countries and jurisdictions participated in the turnover part of the latest triennial survey. This part covered turnover in foreign exchange spot and foreign exchange and interest rate derivatives contracts, broken down by instrument, currency, counterparty and maturity. The instrument breakdown distinguished between forwards, swaps and options (see Section 4). The counterparty breakdown distinguished between transactions with reporting dealers, with other financial institutions and with non-financial customers. A further local/cross-border breakdown was requested (see Section 5). The currency breakdown included separate reporting of all reporting countries' currencies (see Section 6). The maturity breakdown distinguished between transactions up to seven days, over seven days and up to one year, and over one year (see Section 7). Information on the execution method was also requested for foreign exchange transactions (see Section 9). Central banks and monetary authorities were also requested to provide information on the percentage coverage of the survey in their country, the number of banks covering 75% of the reported totals, the number of participants, the number of trading days[5] and the nature of the turnover in April 2007 and during the preceding six months. The results are shown in Table D.1.

[5] Trading days are requested in order that daily averages can be calculated.

Basic features of the April 2007 foreign exchange market survey

	Coverage in per cent	Banks covering 75%	Number of participants	Trading days	Nature of turnover	
					April	Preceding six months
Argentina	97	13	52	18	Above normal	Increasing
Australia	95	8	35	18	Normal	Steady
Austria	92	3	14	20	Normal	Steady
Bahrain	95	4	26	24	Below normal	Increasing
Belgium	95	3	4	19	Below normal	Decreasing
Brazil	62	6	11	20	Normal	Increasing
Bulgaria	95	4	16	21	…	…
Canada	99	6	18	20	Normal	Steady
Chile	100	10	26	20	Normal	Steady
China	90	10	15	21	Normal	Increasing
Colombia	85	15	17	19	Normal	Steady
Czech Republic	92	5	13	20	Normal	Steady
Denmark	97	2	6	18	Below normal	Increasing
Estonia	95	3	4	20	Normal	Decreasing
Finland	100	3	15	19	Below normal	Steady
France	95	4	34	20	Below normal	Increasing
Germany	85	5	18	19	Normal	Steady
Greece	88	3	7	19	Normal	Steady
Hong Kong SAR	95	12	50	18	Normal	Steady
Hungary	88	6	10	19	Normal	Steady
India	83	15	20	20	Normal	Increasing
Indonesia	75	4	13	20	Normal	Steady
Ireland	90	4	14	20	Normal	Steady
Israel	100	4	11	18	Above normal	Increasing
Italy	82	8	27	19	Normal	Steady
Japan	97	9	45	20	Normal	Steady
Korea	98	12	36	21	Normal	Steady
Latvia	60	4	7	19	Normal	Steady
Lithuania	97	4	7	18	Normal	Steady
Luxembourg	100	13	114	19	Normal	Steady
Malaysia	76	8	8	21	Normal	Steady
Mexico	95	6	15	19	Below normal	Decreasing
Netherlands	95	3	7	19	Normal	Steady
New Zealand	85	3	4	18	Normal	Steady
Norway	90	2	8	18	Normal	Steady
Peru	100	5	12	19	Above normal	Increasing
Philippines	100	6	14	18	Normal	Steady
Poland	95	9	18	20	Normal	Steady
Portugal	100	5	70	19	Normal	Steady
Romania	94	7	25	20	Normal	Increasing
Russia	91	12	40	21	Above normal	Increasing

Basic features of the April 2007 foreign exchange market survey (cont)

	Coverage in per cent	Banks covering 75%	Number of participants	Trading days	Nature of turnover	
					April	Preceding six months
Saudi Arabia	90	6	14	25	Normal	Steady
Singapore	99	11	50	20	Normal	Steady
Slovakia	…	4	52	19	…	…
Slovenia	75	6	7	18	Normal	Steady
South Africa	95	4	12	18	Normal	Steady
Spain	75	3	8	19	Normal	Steady
Sweden	90	3	4	19	Normal	Steady
Switzerland	98	3	23	19	Normal	Steady
Taiwan, China	91	16	33	20	Below normal	Increasing
Thailand	100	0	31	18	Normal	Steady
Turkey	96	8	20	20	Normal	Increasing
United Kingdom	98	12	62	19	Normal	Steady
United States	95	10	32	21	Normal	Steady

Table D.1

The second part of the triennial survey covered amounts outstanding and gross market values of foreign exchange, interest rate, equity, commodity and credit derivatives. The following instrument breakdown was requested for each derivatives market risk category: forwards, swaps, OTC options sold, OTC options bought and other products. As in the turnover part of the survey, data were to be broken down by counterparty (see Section 5), currency (see Section 6) and maturity (see Section 7). Additional information on CDSs was collected in this latter part of the survey, with separate reporting of single- and multi-name instruments (see Section 8).

2. Types of data collected

2.1 Turnover data

Turnover data provide a measure of market activity, and can also be used as a rough proxy for market liquidity. Turnover was defined as the absolute gross value of all deals concluded 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 were not to 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 the deal.

Reporting institutions, classified as "reporting dealers"[6], were, in addition, 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". Deals were identified as related party trades regardless of whether the counterparty was resident in the same country as the reporting dealer or in another country. However, trades that were conducted as back-to-back deals and trades to facilitate internal book-keeping and internal risk management within a given institution were excluded from the reporting, regardless of whether they were local or cross-border. In addition, reported trades with own branches and subsidiaries and between affiliated firms were allocated to the categories 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 compared with the previous survey.

As in the previous triennial surveys, turnover data were collected over a one-month period in order to reduce the likelihood of very short-term variations in activity contaminating the data. The data collected for the survey reflected all transactions entered into during the calendar month of April 2007, regardless of whether delivery or settlement was made during that month.

To permit 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 18 to 25 in April 2007.

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.

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.

2.2 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

[6] See Section 5.1 for the definition of reporting dealers.

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 on the last business day of June 2007; end-June was chosen to provide consistency with the semiannual 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 notional principal amounts, notional principal amounts at the reporting date were to be provided.

In contrast to the turnover part of the survey, data on notional amounts outstanding data were collected on a consolidated basis, ie including positions of 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 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.

2.3 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 calculated at market prices prevailing on the reporting date. Replacement value denotes the price to be received or paid if the instrument were sold in the market at the time of reporting. Market values are therefore 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 was available for a contract, the number of trading units was multiplied by that market price. If a quoted market price was not available, the reporting institution provided 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 .

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 was available for a contract, the market value for that contract was the product of the number of trading units of the contract multiplied by that market price. If a quoted market price was not available, the market value of an outstanding option contract was 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.

In the case of options, the 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. As is the case for other instruments, options sold and purchased with the same counterparty were not netted against each other, nor were offset bought and sold options on the same underlying.

Data on gross market values were reported as at end-June 2007, in US dollar equivalents, with non-dollar amounts converted into US dollars using end-of-period exchange rates.

3. Market risk categories

For the turnover part of the survey, two market risk categories were to be separately identified: foreign exchange and interest rate products. In contrast, for the amounts outstanding part of the survey, individual derivatives transactions were to be categorised into five risk classes – foreign exchange, single currency interest rate, equity, commodity and credit – plus a residual "other" derivatives category. In practice, however, individual derivatives transactions may straddle more than one risk category. In such cases, transactions that were simple combinations of exposures were reported separately in terms of their individual components. Transactions that could not

be readily broken down into separable risk components were reported in only one risk category. The allocation of such products with multiple exposures was determined by the underlying risk component that is most significant. However, when, for practical reasons, reporting institutions were in doubt about the correct classification of multi-exposure derivatives, they allocated the deals according to the following order of precedence:

Commodities. Defined as contracts that have a return, or a portion of their return, linked to the price of, or to a price index of, a commodity such as a precious metal (other than gold), petroleum, lumber or agricultural products. Derivatives that have a return, or a portion of their return, linked to the price of *precious metals (other than gold)* were reported separately from *other commodity-linked contracts*. All derivatives transactions involving a commodity or commodity index exposure, whether or not they involved a joint exposure in commodities and any other risk category (ie foreign exchange, interest rate or equity), were to be reported in this category.

Equities. Contracts that have a return, or a portion of their return, linked to the price of a particular equity or to an index of equity prices. 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 this category. This includes equity deals with exposure to foreign exchange or interest rates. Quanto-type instruments are an example of deals with joint equity and foreign currency exposures that would be reported in this category.

Foreign exchange. This category includes all deals involving exposure to more than one currency, whether in interest rates or exchange rates (with the exception of those already reported in the commodity or equity categories).

Single currency interest rate contracts. 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.

4. Instrument definitions

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 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 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.

Instruments to be included in the main plain vanilla instruments (forwards, swaps and options) were defined 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).
Outright forward	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).
Foreign exchange swap	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.
Currency swap	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.
Currency option/warrant	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.
Currency swaption	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

Forward rate agreement (FRA)	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.
Interest rate swap	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.
Interest rate option/warrant	Option contract that gives the right to pay or receive a specific interest rate on a predetermined principal for a set period of time.
Interest rate cap	Option that pays the difference between a floating interest rate and the cap rate.
Interest rate floor	Option that pays the difference between the floor rate and a floating interest rate.
Interest rate collar	Combination of cap and floor.
Interest rate corridor	(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.
Interest rate swaption	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; thus 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

Equity forward	Contract to exchange an equity or equity basket at a set price at a future date.

Equity swap	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.
Equity option/warrant	Option contract that gives the right to deliver or receive a specific equity or equity basket at an agreed price and 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; thus 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

Commodity forward	Forward contract to exchange a commodity or commodity index at a set price at a future date.
Commodity swap	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.
Commodity option	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; thus 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

Credit spread forward	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.

Credit event/default swap	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.
Total return swap	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.

5. Counterparties

Following the methodology of previous triennial central bank surveys, reporting institutions were requested to provide a counterparty breakdown for each instrument depending on whether the counterparty was a reporting dealer, another financial institution or a non-financial customer.[7] In the turnover part of the survey, reporters were also requested to provide separate information on local and cross-border transactions according to the location of the counterparty.[8]

To enable survey participants to identify other reporting dealers and thereby perform the counterparty allocation, a list containing all institutions that participated in the turnover part of the survey was circulated to all market participants together with the main reporting templates.

For the amounts outstanding part, however, the list of institutions circulated for the counterparty allocation only included those 55 reporters that regularly participate in the semiannual OTC derivatives survey. The reason for not including all reporting institutions was to ensure consistency with the regular derivatives market statistics and to limit the reporting burden. While this approach makes it difficult to accurately eliminate double-counting of trades between non-regular reporters (see Section 10), the amounts involved are believed to be small.

---

[7] One of main uses of this counterparty breakdown is the elimination of double-counting. See Section 10.

[8] In other words, not according to its nationality.

5.1 Reporting dealers

Reporting dealers are in general understood as all the institutions that participated in the triennial and semiannual surveys. In principle they 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 inter-dealer 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 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.

5.2 Other financial institutions

This category covers the financial institutions that are not classified as reporting dealers. Thus, it mainly comprises 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.

5.3 Non-financial customers

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

6. Currency and other market risk breakdowns

6.1 Turnover part

In order to obtain consistent data on turnover in principal currency segments, reporting institutions were asked to report turnover data using the same methodology to that in previous surveys. However, to achieve improved coverage of all participating countries' currencies, additional currencies were identified in the reporting templates.

In the foreign exchange segment, reporting dealers were asked to distinguish selected currency pairs. More specifically, each reporter provided separate data for trading in domestic currency, US dollar and euro, against each other and against the individual currencies listed below. It should be noted that the Swedish krona was added in 2007 for the first time to the list below.

JPY: Japanese yen
GBP: Pound sterling

CHF: Swiss franc
CAD: Canadian dollar
AUD: Australian dollar
SEK: Swedish krona
Other currencies

An additional "residual" column was provided for transactions *between* any pair of the six currencies listed above[9] or other currencies not identified separately.

Given the increasing interest in turnover data in all reporting countries' currencies, an additional currency breakdown was provided for the identification of those currencies reported under the previously mentioned categories "other currencies" and "residual". This additional currency reporting was conducted on an aggregate basis rather than on a currency pair basis.

In 2007, 19 currencies were added to this additional currency breakdown. These are the Argentine peso, Australian dollar, Bahraini dinar, Bulgarian lev, Canadian dollar, Swiss franc, Chilean peso, Colombian peso, Estonian kroon, pound sterling, Israeli new shekel, Japanese yen, Lithuanian litas, Latvian lats, Malaysian ringgit, Peruvian new sol, Romanian leu, Saudi riyal and Slovak koruna.

The inclusion of the Australian and Canadian dollars, Japanese yen, the Swedish krona, Swiss franc and Pound sterling in this list allows for the reporting of transactions involving these currencies that did not have the local currency, the US dollar or the euro on the other side of the deal. The complete list of additional currencies is listed below.

ARS: Argentine peso
AUD: Australian dollar[10]
BHD: Bahraini dinar
BRL Brazilian real
BGN: Bulgarian lev
CAD: Canadian dollar[10]
CHF: Swiss franc[10]
CLP: Chilean peso
CNY: Chinese renminbi
COP: Colombian peso
CZK: Czech koruna
DKK: Danish krone
EEK: Estonian kroon
GBP: Pound sterling[10]
HKD: Hong Kong dollar
HUF: Hungarian forint

[9] Not applicable for those cases where the listed currencies were the reporting country's local currency.

[10] For cases where this currency was not identified in one leg but reported under "residual" instead.

IDR: Indonesian rupiah
ILS: Israeli new shekel
INR: Indian rupee
JPY: Japanese yen[10]
KRW: Korean won
LTL: Lithuanian litas
LVL: Latvian lats
MXN: Mexican peso
MYR: Malaysian ringgit
NOK: Norwegian krone
NZD: New Zealand dollar
PEN: Peruvian new sol
PHP: Philippine peso
PLN: Polish zloty
RON: Romanian leu
RUB: Russian rouble
SAR: Saudi riyal
SEK: Swedish krona[10]
SGD: Singapore dollar
SKK: Slovak koruna
THB: Thai baht
TRL: Turkish lira
TWD: new Taiwan dollar
ZAR: South African rand
Other

For the single currency interest rate segment, the same expanded currency breakdown was requested:

Local currency, USD, EUR, JPY, GBP, CHF, CAD, AUD, SEK, ARS, BGN, BHD, BRL, CLP, CNY, COP, CZK, DKK, EEK, HKD, HUF, IDR, ILS, INR, KRW, LTL, LVL, MXN, MYR, NOK, NZD, PEN, PHP, PLN, RON, RUB, SAR, SGD, SKK, THB, TRL, TWD, ZAR, Other.

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

6.2 Amounts outstanding part

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 euros with a notional principal amount of $100 million will have reported $100 million in the US dollar column, another $100 million in the euro column, and $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.

7. 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 has not come due, the remaining maturity of each leg was determined as the difference between the reporting date and the settlement or due date, respectively, of the near- and far-end legs of the transaction.

8. Additional information on credit default swaps

As of 2007 the triennial survey was expanded to include data on credit default swaps (CDS) following the introduction of CDS in the BIS semiannual OTC derivatives statistics reported by G10 countries. Credit default swaps are defined as bilateral financial contracts in which the protection buyer (risk-shedder) pays a fixed periodic fee in return for a contingent payment by the protection seller (risk-taker), triggered by a credit event on a reference entity. Credit events, which are specified in CDS contracts, may include bankruptcy, default or restructuring.

Reporters were asked to provide nominal or notional amounts outstanding bought and sold, and gross market values for the following instruments:

- *Single name CDSs*: contracts where the reference entity is a single name;
- *Multi-name CDSs*: contracts where the reference entity is more than one name, as in portfolio or basket credit default swaps or credit default swap indices. A basket credit default swap is a CDS where the credit event is

the default of some combination of the credits in a specified basket of credits.[11] Another common form of multi-name CDS is that of the "tranched" credit default swap.[12]

Credit-linked notes, options on CDSs and total return swaps were not to be included as credit default swaps. In addition, no netting of contracts was permitted for amounts outstanding bought and sold. Protection sold by the reporting bank to third parties was not netted against the reporting bank's protection bought from third parties, and contracts subject to bilateral netting agreements were not netted for reporting purposes.

The notional value to be reported was that of the maximum default protection specified in the contract itself and not the par value of financial instruments intended to be delivered.

Reporting institutions were also requested to provide information on CDS gross positive and gross negative marked to market values. For transactions linked to synthetic portfolio products such as CDSs for a super-senior tranche, it might be difficult to calculate a market value. In these cases, the data were to be partly estimated and reported on a best efforts basis.

A breakdown was requested by economic sector of the obligor of the underlying reference obligation (reference entity) as follows:

- *Sovereigns*: in principle only entities of a country's central, state or local government, excluding publicly owned financial or non-financial firms, such as international organisations;
- *Non-sovereigns*: all institutions not listed above.

9. Execution methods for foreign exchange transactions

Reporting institutions were asked to provide information on the execution method used to settle their foreign exchange transactions. Separate information was requested for spot, outright forwards, foreign exchange swaps and options.

Amounts outstanding were to be reported separately according to the following categories:

Interbank direct (inter-reporting dealer)	Executed between two dealers participating in the triennial survey and not intermediated by a third party. For example, a transaction executed via direct telephone communication or direct electronic dealing systems such as Reuters Conversational Dealing.

[11] In the particular case of an nth-to-default basket it is the nth credit in the basket of reference credits whose default triggers payments.

[12] Variations operate under specifically tailored loss limits – these may include a "first loss" tranched CDS, a "mezzanine" tranched CDS, and a senior (also known as a "super-senior") tranched CDS.

Customer direct (inter-dealer/customer)	Executed between a reporting dealer and either a customer or a non-reporting dealer, and not intermediated by a third party. For example, a deal executed via direct telephone communication or direct electronic dealing systems such as Reuters Conversational Dealing.
Electronic broking systems	Executed via automated order matching system for foreign exchange dealers. Examples of such systems are EBS and Reuters Matching 2000/2.
Electronic trading systems	Executed via a single-bank proprietary platform or a multi-bank dealing system. These systems are generally geared towards customers. Examples of multi-bank systems include FXAll, Currenex, FXConnect, Globalink and eSpeed.
Voice broker	Executed via telephone communication with a foreign exchange voice broker.

10. Elimination of double-counting

Double-counting arises because transactions between two reporting entities are recorded by each of them and are therefore reported twice to the BIS. To derive a representative measure of the overall market size, it is necessary to halve those transactions that are being collected twice. To enable this, reporters were asked to separately identify and report on deals contracted with other reporters (see counterparty breakdown under Section 5).

The following methods of adjustment were applied for the three different types of data collected: turnover, notional amounts outstanding and gross market values.

10.1 Double-counting: netting of turnover data

In the case of turnover data, in order to obtain country aggregates, the BIS deducted one half of the amounts reported under "*with local reporting dealers"* to arrive at the so-called "net-gross" figure, ie country aggregates net of local inter-dealer double-counting. In a second step, to obtain global aggregates, the BIS performed an additional calculation, which is the deduction of one half of the amount reported under *"with cross-border reporting dealers"* to arrive at the so-called "net-net" figure, ie the overall global turnover figure net of local and cross-border inter-dealer double-counting.

Based on this principle, country aggregates are systematically shown in all tables as net-gross figures while global aggregates are presented as net-net totals[13].

[13] In some cases tables by country also include gross-gross aggregates for information purposes.

Double-counting and the specific case of overnetting

In the case of turnover data, the procedure used to eliminate double-counting between reporting dealers across countries implicitly assumes that each transaction is reported twice. This assumption might introduce a bias at the currency level if, for example, one country accurately reports cross-border transactions in their local currency with reporting dealers in the rest of the world, but counterparties in the rest of the world do not separately identify those deals under the relevant currency but under the residual category instead. In this case, the method of halving inter-dealer cross-border transactions will underestimate the size of trade for this currency. The resulting effect is referred to as overnetting.

Overnetting is likely to be more relevant for currencies with lower turnover since they are less likely to be separately identified by large centres. The consequence can be that the global turnover for the segment "with reporting dealers cross-border" for a given currency could be less than the turnover reported by the currency's home country.

One way of partially correcting for overnetting is to only use the domestic report of cross-border trade in local currency as an estimate in cases where the overnetting is evident. The reasoning behind this methodology is that global turnover for each currency should be at least equal to the turnover reported by the currency's home country.

After measuring the extent to which the overnetting could affect each individual currency covered by the survey, results suggested that, at an aggregate level, some cases of overnetting can be found in currencies like the Hong Kong dollar, Russian rouble, Slovak koruna and Danish krone. All currencies affected by this bias are listed in Table D.2 below.

Overnetting estimation for inter-dealer cross-border transactions

Traditional foreign exchange turnover in April 2007, in millions of US dollars

	Reported by country of origin	Reported by rest of the world	Calculated net-net figure	Overnetting
Bahraini dinar	14	1	7	7
Bulgarian lev	11	8	10	1
Chilean peso	746	40	393	353
Colombian peso	111	14	62	49
Danish krone	11,099	9,834	10,466	632
Estonian kroon	716	23	369	347
Hong Kong dollar	45,118	25,952	35,535	9,583
Lithuanian litas	178	64	121	57
Peruvian new sol	160	2	81	79
Russian rouble	3,295	1,318	2,306	989
Saudi riyal	569	457	513	56
Slovak koruna	3,216	1,334	2,275	941

Table D.2

It is acknowledged that this bias can also be present for other major currencies; however, the lack of a vis-à-vis country breakdown makes it impossible to measure the size of the bias.

10.2 Double-counting: netting of amounts outstanding data

The same methodology was applied for notional amounts outstanding. The only distinction from the turnover data was that amounts outstanding were collected on a worldwide consolidated basis, which implied that there was no relevant local/cross-border distinction. Double-counting was therefore eliminated by deducting half of the amount reported under "*with reporting dealers*".

For commodity contracts, for which no counterparty breakdown was collected, the adjustments for double-counting were estimated using the results of the 1995 survey.

10.3 Double-counting: netting of gross market values

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 were performed as follows: in a first step, gross positive and negative market values of contracts held by reporting institutions were added together to obtain data on a "gross-gross" basis. In a second step, the gross negative market value of contracts with other reporting dealers was 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 did not participate in the regular derivatives market statistics exercise in the G10 countries, the adjustments for double-counting were 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 were 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 country coverage. The second type of gap is mitigated by the existence of counterparty reports. The bulk of the cross-border business of institutions located in non-reporting countries is very likely to be captured by the reports of their counterparties if they are reporting dealers in countries participating in the survey. However, transactions between dealers in non-reporting countries, and between non-reporting dealers and customers or other financial institutions are not captured.

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.3). Gaps from incomplete reporting in the countries providing data were also estimated for derivative instruments (see Table C.1). The basis for estimating gaps due to incomplete reporting in the countries providing the data was the information supplied on the coverage of the survey in each participating country. 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 by all major dealers in the participating countries.

Measures of global foreign exchange market activity[1]

Daily averages in April, in billions of US dollars

	1995	1998	2001	2004	2007
Total reported gross turnover	1,864	2,337	1,861	2,751	4,399
Adjustment for local double-counting[2]	–292	–368	–245	–322	–411
Total reported turnover net of local double-counting ("net-gross")	1572	1,969	1,616	2,429	3,988
Adjustment for cross-border double-counting[2]	–435	–539	–444	–635	–907
Total reported "net-net" turnover	1,137	1,430	1,172	1,794	3,081
Of which: cross-border transactions	*611*	*772*	*673*	*1,099*	*1,896*
Estimated gaps in reporting[3]	53	60	26	106	129
Estimated global turnover	1,190	1,490	1,200	1,900	3,210

[1] Including spot, outright forward and foreign exchange swap transactions. [2] Made by halving positions vis-à-vis other local reporting dealers and other reporting dealers abroad respectively. [3] Based on reported coverage. Table D.3

12. Intertemporal comparisons

Intertemporal comparisons are complicated by changes in coverage and definitions and the movement of exchange rates over the three-year period separating the surveys.

An important change in coverage relates to the inclusion of a larger number of countries. In 1986 only four countries[14] participated in the triennial survey. In 1989 a further 17 countries[15] were invited to participate, and in 1992 the number rose to 26.[16] In 1995 the number of countries did not increase further, but the coverage of market activity was significantly expanded. In 1998 another 17 countries[17] participated, bringing the total to 43. Finally in 2001, 2004 and 2007 the number further increased to 48,[18] 52[19] and 54[20] respectively.

In terms of intertemporal comparisons, while the additional information provided by the two new reporting countries invited in 2007 is very valuable, not all of it relates to transactions that were not captured previously. The bulk

[14] Canada, Japan, the United Kingdom and the United States.

[15] Australia, Bahrain, Belgium, Demark, Finland, France, Greece, Hong Kong SAR, Ireland, Italy, the Netherlands, Norway, Portugal, Singapore, Spain, Sweden and Switzerland.

[16] Austria, Germany, Luxembourg, New Zealand and South Africa participated for the first time.

[17] Argentina, Brazil, Chile, China, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, the Philippines, Poland, Russia, Saudi Arabia, Taiwan (China) and Thailand.

[18] With Colombia, Israel, Peru, Slovenia, Slovakia and Turkey participating for the first time, but Argentina did not report in that survey.

[19] Following the addition of Estonia, Latvia and Lithuania.

[20] With Bulgaria and Romania participating for the first time.

of these countries' cross-border transactions with dealers can be presumed to have been included in the reports of their counterparties in earlier years. The business not previously captured therefore relates to local inter-dealer transactions in those countries, as well as deals with non-reporting financial institutions and customers.

Another factor to be considered is that, within national markets, the number of dealers active in national markets might have changed over time. 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 having reported 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.

Intertemporal comparisons are also affected by changes in data coverage and definitions. In 1995 the coverage of market activity was significantly expanded to include all financial derivatives and to collect data not only on turnover, but also on notional amounts outstanding and gross market values. In 1998 the coverage of derivatives market activity was further expanded to include separate data on credit-linked derivatives. In 2001, 2004 and 2007 data templates were further expanded, mainly to improve the currency coverage.

Although the expansion of the currency dimension of the reporting templates in 2007 is not likely to have affected turnover aggregates, some transactions that would have been reported under the residual category in previous surveys were now separately identified. The effect of the template expansion on selected currencies' total traditional turnover is shown in Table D.4. Some caution should therefore be exercised when making intertemporal comparisons about turnover for the currencies involved.

Another complication involves changes in definitions. Most changes in definition reflect improvements in compilation procedures. Greater efforts were made to classify counterparties accurately following the 1992 survey and a finer counterparty breakdown was used. As a result, it was possible to arrive at more accurate estimates of double-counting and to compile net figures on turnover for many items. In 1998 the reporting basis for the amounts outstanding part was changed substantially: data were collected on a worldwide consolidated basis, as compared to a locational unconsolidated basis in 1995. In 2004 the reporting basis for the location of trades was further clarified as being, in principle, that of the sales desk of any reporting institution. A further effort was also made to clarify the concept of reporting dealers, in order to better distinguish between inter-dealer and customer transactions.

Effect of template expansion on selected currencies

Traditional foreign exchange turnover,[1] in millions of US dollars

Currency	Total	Of which: due to template expansion	% share of total
Argentine peso	1,107	20	1.8
Australian dollar	205,226	12,241	6.0
Bahraini dinar	70	2	3.4
Bulgarian lev	233	7	3.2
Canadian dollar	129,787	4,125	3.2
Chilean peso	3,498	126	3.6
Colombian peso	1,712	24	1.4
Estonian kroon	483	68	14.1
Israeli new shekel	4,722	369	7.8
Japanese yen	509,731	16,242	3.2
Latvian lats	355	144	40.6
Lithuanian litas	633	137	21.6
Malaysian ringgit	4,302	1,782	41.4
Peruvian new sol	665	8	1.1
Pound sterling	460,779	10,323	2.2
Romanian leu	1,631	319	19.6
Saudi riyal	1,829	341	18.7
Slovak koruna	2,960	1,146	38.7
Swiss franc	208,790	5,163	2.5

[1] Including spot, outright forward and foreign exchange swap transactions. Table D.4

13. Data at constant exchange rates

Another question often raised with intertemporal comparisons is the extent to which movements in exchange rates vis-à-vis the US dollar affect aggregate turnover, and its composition from one reporting date to the next. For instance, turnover in the Japanese yen/pound sterling sector might have remained unchanged from one reporting period to the next in terms of these currencies. But if the dollar rises against both currencies, total turnover in the segment reported in dollar terms will be lower, thus signalling a decline where none has in fact taken place. Even for currency pairs involving the dollar, exchange rate movements will affect estimates of turnover. For example, if a trade for a fixed amount of yen against US dollars is transacted, the trade will enter the aggregates with a smaller or larger US dollar amount, depending on how the yen moves against the dollar from one reporting date to the next.

To provide some guidance on the impact of exchange rate movements on total reported aggregates, at constant April 2007 exchange rates, historical exchange rates were replaced by average April 2007 exchange rates. All transactions in a given currency, say the yen, were converted into original currency terms at the historical exchange rate and then recalculated using the average April 2007 dollar/yen exchange rate. The share of the US dollar

Currency distribution of foreign exchange turnover[1] at April 2007 exchange rates

Percentage share of average daily turnover in April

	2001	2004	2007
US dollar	76.16	85.20	86.35
Euro	48.06	40.00	36.98
Japanese yen	19.89	17.56	16.54
Pound sterling	15.47	17.88	14.95
Swiss franc	7.22	6.19	6.78
Australian dollar	5.90	6.33	6.66
Canadian dollar	5.16	4.73	4.21
Swedish krona	2.59	2.43	2.78
Hong Kong dollar	1.88	1.78	2.78
Norwegian krone	1.38	1.59	2.17
New Zealand dollar	0.35	1.20	1.91
Mexican peso	0.58	1.11	1.27
Singapore dollar	0.94	1.02	1.22
Korean won	0.88	1.40	1.10
South African rand	0.93	0.68	0.93
Danish krone	1.29	0.99	0.90
Russian rouble	0.34	0.73	0.81
Polish zloty	0.56	0.53	0.79
Indian rupee	0.23	0.34	0.69
Chinese renminbi	0.01	0.10	0.47
New Taiwan dollar	0.23	0.39	0.38
Brazilian real	0.41	0.33	0.36
Hungarian forint	0.02	0.22	0.28
Czech koruna	0.30	0.20	0.22
Thai baht	0.19	0.23	0.21
Israeli new shekel	0.09	0.12	0.15
Turkish lira	0.03	0.11	0.15
Malaysian ringgit	0.07	0.06	0.14
Chilean peso	0.18	0.14	0.11
Philippine peso	0.04	0.05	0.11
Indonesian rupiah	0.05	0.10	0.11
Slovak koruna	0.04	0.06	0.10
Saudi riyal	0.06	0.04	0.06
Colombian peso	0.03	0.04	0.06
Romanian leu	–	–	0.05
Argentine peso	–	0.03	0.04
Peruvian new sol	0.02	0.01	0.02
Lithuanian litas	–	0.01	0.02
Estonian kroon	–	0.00	0.02
Latvian lats	–	0.00	0.01
Bulgarian lev	–	–	0.01
Bahraini dinar	0.01	0.00	0.00
Other	8.44	6.06	7.10
All currencies	200.0	200.0	200.0

[1] Including spot, outright forward and foreign exchange swap transactions. The figures relate to reported "net-net" turnover, ie they are adjusted for local and cross-border double-counting. Table D.5

remained unaffected by this adjustment. A currency distribution of foreign exchange turnover at April 2007 exchange rates is shown in Table D.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 2007 and the semiannual OTC derivatives market statistics in the G10 countries at end-June 2007 are presented in the following Annex tables in two separate sections (A and B): Section A covers turnover in foreign exchange markets, ie turnover in traditional foreign exchange business, such as spot, outright forwards and foreign exchange swaps (Section A1) as well as in OTC foreign exchange and interest rate derivatives (Section A2); and section B comprises notional amounts outstanding and gross market values of OTC derivatives markets, ie foreign exchange, interest rate, equity, commodity and credit derivatives, including credit default swaps (CDSs). There is an overlap in Section A as the tables on OTC derivatives turnover include data on outright forwards and foreign exchange swaps, which are also covered in the tables on turnover in the so-called traditional foreign exchange markets.

Country aggregates are systematically shown in all tables as net-gross figures while global aggregates are presented as net-net totals (see Section 10).

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

14.1 Turnover on foreign exchange markets (Section A.1)

Tables E.1 to E.3 show total reported foreign exchange market turnover net of both local and cross-border double-counting[21] by market segment, counterparty and currency. No adjustments were made for gaps in reporting in these or any other Annex tables.

Because two currencies are involved in each deal, the sum of transactions in all individual currencies shown in Table E.1 equals twice the total 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 might be understated (see Section 11 and the box on

[21] See Section 10.

overnetting). 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 that have been individually identified as the local currency of another country participating in the survey (see Section 6 for the full list of currencies identified in the survey). Data in the "residual currencies" column represent the difference between the total and sum of components.

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 swap 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 Turnover on derivatives markets (Section A.2)

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 double-counting. The data broken down by country are adjusted for local inter-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.

14.3 Positions (amounts outstanding) on derivatives markets (Section B)

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 currency). The data are adjusted for inter-dealer double-counting.

Table E.42 contains detailed information on reported notional amounts outstanding bought and sold of CDSs, broken down by instrument, counterparty and sector. Total amounts outstanding are shown on a net basis, while amounts outstanding bought and sold are shown on a gross basis, ie not adjusted for inter-dealer double counting.

Tables E.43 to E.46 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. Table E.46 also contains data on reported gross positive and negative market values of CDSs. The data are not adjusted for inter-dealer double-counting.

Tables E.47 to E.49 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.50 to E.52 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.