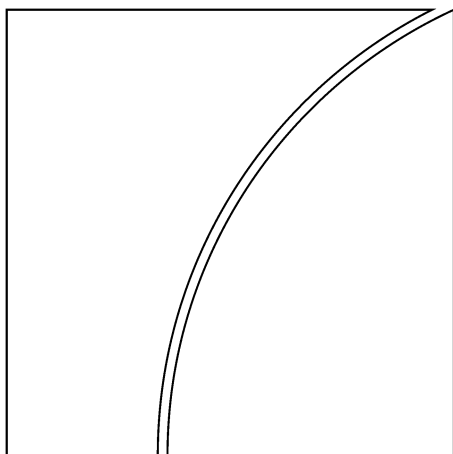




BANK FOR INTERNATIONAL SETTLEMENTS

Monetary and Economic  
Department

## **OTC derivatives market activity in the second half of 2002**



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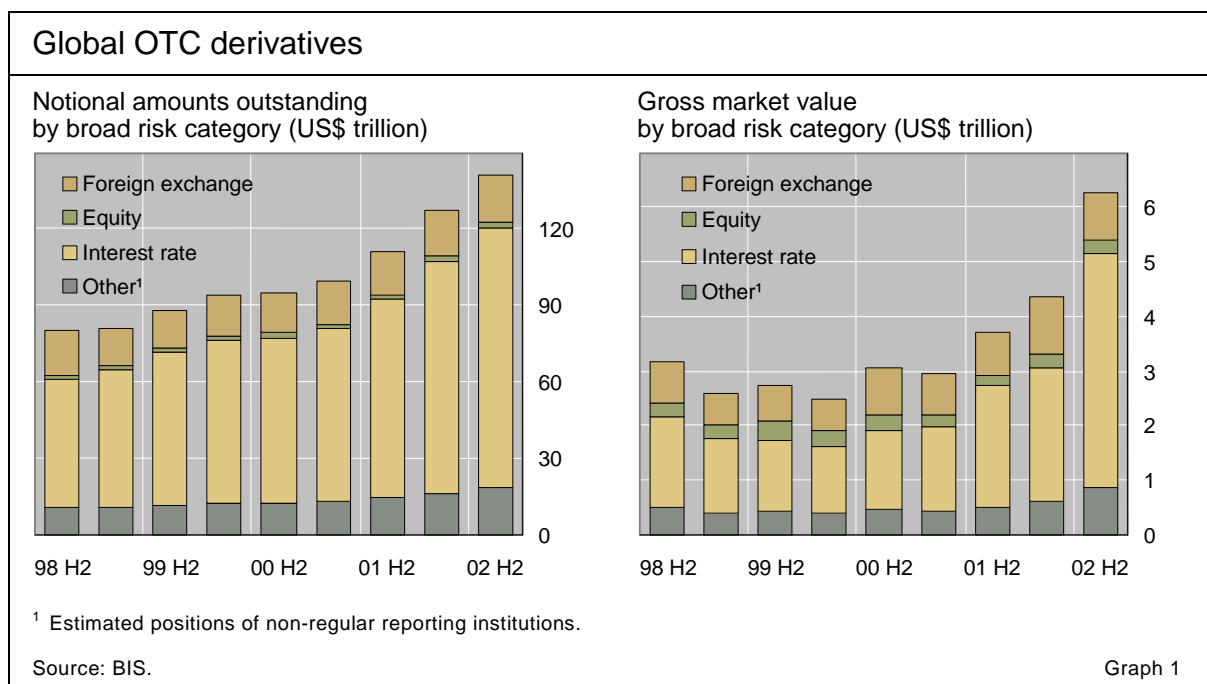
## I. Market developments in the second half of 2002

The data released by the BIS on positions in the global over-the-counter (OTC) derivatives market point to unusually robust growth in euro-denominated interest rate swap contracts in the second half of 2002. As a result, the total estimated notional amount of outstanding OTC contracts stood at \$141.7 trillion (see Graph 1) at the end of December 2002, an 11% increase from end-June 2002. This compares with a 15% increase in the previous half-year period. At the same time, gross market values grew sharply, rising by 43% to \$6.4 trillion, compared with a 18% increase in the first half of 2002. Notional amounts of interest rate contracts rose by 13% and gross market values by 73% in the second half of 2002. Within this segment, euro-denominated swap contracts showed the strongest growth, rising by 25% and 111%, respectively, over the same time frame.

### 1. Substantial rise in gross market values

In contrast to the first half of 2002, when much of the increase in total gross market values took place in foreign exchange contracts, in this period interest rate contracts accounted for the bulk of the 43% rise (see Table 3). This had the effect of increasing the overall ratio of gross market values to notional amounts outstanding (for all risk categories) from its stable 2001 level of 3.5% to 4.5% of total OTC derivatives market activity by the end of 2002. Contributing to this substantial rise was the fact that long-term interest rates (10-year government bonds) fell substantially in all major regions throughout the third quarter. Rates in the United States fell from a 2002 peak of 5.4% (1 April) to a low of 3.6% (9 October) before fluctuating for the remainder of the year around the 4% level. A change in the differential between short- and long-term interest rates will lead to an increase in the value of interest rate swap contracts for some counterparties and a symmetrical loss for others. A significantly large change will be reflected in gross market values. Simultaneously, the third quarter of 2002 correspondingly saw a marked increase in the implied volatility of long-term fixed income contracts, peaking in October (matched in direction by the implied volatility of the S&P 100).

It should, however, be noted that data on gross market values tend to overstate the actual credit exposures faced by counterparties because they do not take into account the availability of legally enforceable bilateral netting arrangements and other risk reducing measures. After taking into account such netting arrangements, the derivatives-related gross credit exposures of reporting institutions stood at \$1.5 trillion at the end of the most recent half-year, a 15% increase period on period.

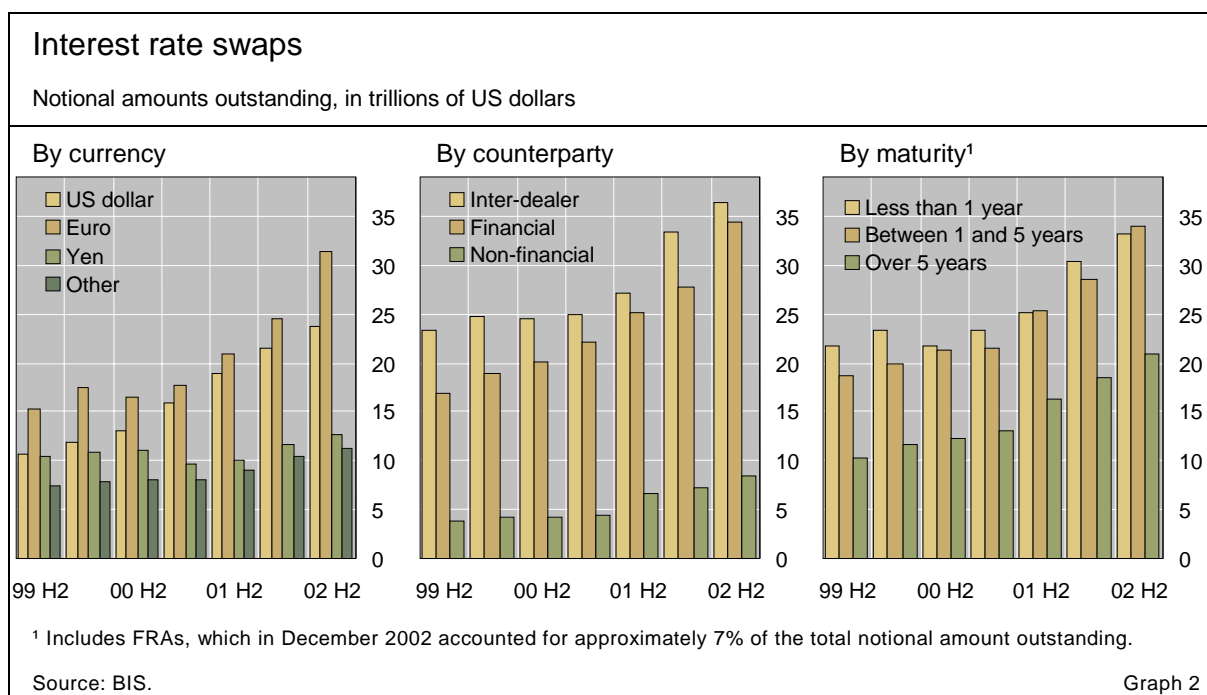


## 2. Strong double digit growth in notional amounts outstanding

The growth in the interest rate product segment continued unabated, reaching \$101.7 trillion of notional amounts outstanding (see Table 1). Activity varied across interest rate products: the interest rate segment as a whole posted a headline advance of 13% in amounts outstanding versus +16% in the first half of 2002. Interest rate swaps rose by 16% period on period, the same rate as in the previous six months. This is equivalent to a year-on-year increase of 34%. Forward rate agreements (FRAs) showed a decline of 4% to the end of December, a sharp reversal from the 18% increase posted in the first half of 2002, whilst the interest rate options category showed an increase of 9%. In contrast, overall business in OTC foreign exchange markets was rather pedestrian. Outstanding contracts rose by a meagre 2% for this risk category. Currency options were partly responsible: this area slowed dramatically, from a surge of 39% in the first half of 2002 to a 6% decline in the latter half of the year. Activity in equity-linked contracts followed a similar path to the foreign exchange segment, posting a 4% increase in amounts outstanding. The stock of commodity contracts grew by 19%.<sup>1</sup>

## 3. Euro-denominated swap instruments dominate

With \$79 trillion in outstanding contracts, interest rate swaps remain by far the largest single group of products in the OTC derivatives market (see Tables 1 and 3), representing 56% across market risk categories. The US dollar-denominated interest rate swap market grew by 10% in the second half with outstanding contracts rising to \$23.7 trillion. The US dollar value of yen swaps rose by 9% to \$12.8 trillion (there was no strong movement of the yen/dollar rate over this period). The euro-denominated swap market continues to be the strongest performer, with outstanding contracts standing at \$31.5 trillion. This area showed a dramatic 28% increase in the second half of 2002 in US dollar terms. There was a notable currency effect with the euro appreciating by 7% over this period; however, at constant exchange rates growth remains strong at 20%.



<sup>1</sup> Data on credit derivatives are not collected in the semiannual BIS survey of OTC derivatives market activity.

As illustrated in Graph 2, increases in amounts outstanding in absolute terms were driven strongly by the increased use of euro-denominated swaps by other financial institutions not in the inter-dealer segment. Market expectations nearing the middle of 2002 strongly favoured an improving economic environment and the prospect of rising interest rates. Such expectations are likely to have created a bias in the swap market to receive floating and pay fixed rates. But from the end of June, uncertainty caused by corporate scandals and weak economic data announcements turned hopes for a strong recovery to concerns over further economic weakness. In addition, the rising exchange value of the euro helped to stem any concern that the ECB might raise rates in the near future. This shift in perceptions is likely to have prompted substantial position reversal in the swap market to pay floating and receive fixed rates.

#### **4. Subdued market for currency derivatives**

The OTC foreign exchange market was largely stable in the second half of 2002 (see Table 1), with the stock of contracts remaining around \$18 trillion. Forwards and foreign exchange swaps and currency swaps showed single digit growth but currency options fell by 6% in terms of notional amounts outstanding (a pronounced surge in option volatility against the US dollar was in evidence at the end of the second quarter and this higher level was maintained through the second half of the year). There was a noticeable moderation of growth relative to the first half of the year in most major currency sectors (see Table 2). Contracts involving the US dollar expanded by 3%, those involving the euro grew by 7% (against +15% the first half of 2002), while those involving the yen increased by 8%.

#### **5. OTC business accelerates relative to that on exchanges**

OTC business continued to accelerate relative to that on exchanges in the six months to the end of 2002. The notional amount of OTC contracts expanded by 11% in the second half of the year, while open positions in exchange-traded contracts were stagnant, falling by 1%.<sup>2</sup> This continues the trend of the first half of 2002, when the stock of OTC contracts had increased by 15%, compared to only 1% for exchange-traded contracts.

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<sup>2</sup> It should be noted, however, that activity in the two types of markets cannot be directly compared owing to inherent differences in the characteristics and uses of products. In exchange-traded derivatives markets, the reversal of an initial position leads to a decline in open interest because of the offsetting of contracts through a central counterparty. In OTC derivatives markets, such a reversal involves the writing of new positions, which leads to an increase in notional amounts outstanding.

## II. Statistical notes

### 1. Coverage

**Overall coverage:** As from end-June 1998, the central banks of the G10 countries have collected statistics on OTC derivatives on a semiannual basis. The data are reported by major derivatives dealers, and compiled and published by the BIS. Prior to that date, the BIS used to compile and publish OTC derivatives data based on information provided by the International Swaps and Derivatives Association (ISDA). The latter were limited to data on turnover and contracts outstanding in notional amounts of currency and interest rate swaps and swap-related transactions, such as caps, collars, floors and swaptions, as provided by a restricted number of reporting dealers.

The current semiannual OTC derivatives market statistics provide comprehensive data not only on notional amounts but also on gross market values outstanding of forwards, swaps and options of foreign exchange, interest rate, equity and commodity derivatives. However, in contrast to the exchange-traded derivatives statistics, data are only available on amounts outstanding and not on turnover of contracts. All published figures are adjusted for double-counting resulting from positions between reporting institutions. Notional amounts outstanding are adjusted by halving positions vis-à-vis other reporting dealers. Gross market values are adjusted by adding total gross positive market value of contracts to the gross negative market value of contracts with non-reporting counterparties only.

**Reporting:** The regular OTC derivatives market statistics are currently reported by more than 60 major reporting dealers in the G10 countries. The overall coverage of the market is fairly comprehensive, as OTC derivatives activity is highly concentrated. Moreover, the reporting dealers are requested to report their transactions on a worldwide consolidated basis inclusive of the activity of their foreign affiliates. Deals between affiliates of the same institution are excluded. All data are reported to the BIS in US dollars. Positions in other currencies of individual segments or instruments are converted into US dollars by reporting dealers at the exchange rate prevailing at the end of each reporting period. Data are broken down by market risk category, type of instrument, counterparty and remaining maturity.

### 2. Definitions

**Notional amounts outstanding:** Nominal or notional amounts outstanding are defined as the gross nominal or notional value of all deals concluded and not yet settled at the reporting date. For contracts with *variable nominal or notional principal amounts*, the basis for reporting is the nominal or notional principal amounts at the time of reporting.

Nominal or notional amounts outstanding provide a measure of market size and a reference from which contractual payments are determined in derivatives markets. However, such amounts are generally not those truly at risk. The amounts at risk in derivatives contracts are a function of the price level and/or volatility of the financial reference index used in the determination of contract payments, the duration and liquidity of contracts and the creditworthiness of counterparties. They are also a function of whether an exchange of notional principal takes place between counterparties. Gross market values provide a more accurate measure of the scale of financial risk transfer taking place in derivatives markets.

**Gross positive and negative market values:** Gross market values are defined as the sums of the absolute values of all open contracts with either positive or negative replacement values evaluated at market prices prevailing at the reporting date. Thus, the gross positive market value of a dealer's outstanding contracts is the sum of the replacement values of all contracts that are in a current gain position to the reporter at current market prices (and therefore, if they were settled immediately, would represent claims on counterparties). The gross negative market value is the sum of the values of all contracts that have a negative value on the reporting date (ie those that are in a current loss position and therefore, if they were settled immediately, would represent liabilities of the dealer to its counterparties).

The term gross is used to indicate that contracts with positive and negative replacement values with the same counterparty are not netted. Nor are the sums of positive and negative contract values within



a market risk category such as foreign exchange, interest rate contracts, equities and commodities set off against one another.

As stated above, gross market values supply information about the potential scale of market risk in derivatives transactions. Furthermore, gross market value at current market prices provides a measure of economic significance that is readily comparable across markets and products.

**Current credit exposure and liabilities:** Current credit exposure represents the gross value of contracts that have a positive market value after taking account of legally enforceable bilateral netting agreements. Liabilities arising from OTC derivatives contracts represent the gross value of contracts that have a negative market value taking account of legally enforceable bilateral netting agreements.

### **3. Data availability**

The aggregate data from end-June 1998 onwards are available, with their main breakdowns, on the BIS website under <http://www.bis.org/statistics/derstats.htm>

### **4. Next publication dates**

The next OTC derivatives statistics covering the first half of 2003 will be released no later than 20 November 2003.

### III. Statistical tables

Table 1  
**The global OTC derivatives market<sup>1</sup>**  
 Amounts outstanding in billions of US dollars

	Notional amounts				Gross market values			
	End– Jun 2001	End– Dec 2001	End– Jun 2002	End– Dec 2002	End– Jun 2001	End– Dec 2001	End– Jun 2002	End– Dec 2002
<b>GRAND TOTAL</b>	<b>99,755</b>	<b>111,178</b>	<b>127,564</b>	<b>141,737</b>	<b>3,045</b>	<b>3,788</b>	<b>4,450</b>	<b>6,361</b>
<b>Foreign exchange contracts</b>	<b>16,910</b>	<b>16,748</b>	<b>18,075</b>	<b>18,469</b>	<b>773</b>	<b>779</b>	<b>1,052</b>	<b>881</b>
Outright forwards and forex swaps	10,582	10,336	10,427	10,723	395	374	615	468
Currency swaps	3,832	3,942	4,220	4,509	314	335	340	337
Options	2,496	2,470	3,427	3,238	63	70	97	76
<b>Interest rate contracts<sup>2</sup></b>	<b>67,465</b>	<b>77,568</b>	<b>89,995</b>	<b>101,699</b>	<b>1,573</b>	<b>2,210</b>	<b>2,468</b>	<b>4,267</b>
FRAs	6,537	7,737	9,146	8,792	15	19	19	22
Swaps	51,407	58,897	68,274	79,161	1,404	1,969	2,214	3,864
Options	9,521	10,933	12,575	13,746	154	222	235	381
<b>Equity-linked contracts</b>	<b>1,884</b>	<b>1,881</b>	<b>2,214</b>	<b>2,309</b>	<b>199</b>	<b>205</b>	<b>243</b>	<b>255</b>
Forwards and swaps	329	320	386	364	49	58	62	61
Options	1,556	1,561	1,828	1,944	150	147	181	194
<b>Commodity contracts<sup>3</sup></b>	<b>590</b>	<b>598</b>	<b>777</b>	<b>923</b>	<b>83</b>	<b>75</b>	<b>78</b>	<b>85</b>
Gold	203	231	279	315	21	20	28	28
Other	387	367	498	608	62	55	51	57
Forwards and swaps	229	217	290	402	...	...	...	...
Options	158	150	208	206	...	...	...	...
<b>Other<sup>4</sup></b>	<b>12,906</b>	<b>14,384</b>	<b>16,503</b>	<b>18,337</b>	<b>417</b>	<b>519</b>	<b>609</b>	<b>871</b>
<b>Gross credit exposure<sup>5</sup></b>					<b>1,019</b>	<b>1,171</b>	<b>1,316</b>	<b>1,511</b>
<i>Memorandum item: Exchange-traded contracts<sup>6</sup></i>	19,522	23,798	24,083	23,874				

<sup>1</sup> All figures are adjusted for double-counting. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers. Gross market values have been calculated as the sum of the total gross positive market value of contracts and the gross negative market value of contracts with non-reporting counterparties. <sup>2</sup> Single currency contracts only. <sup>3</sup> Adjustments for double-counting estimated. <sup>4</sup> Estimated positions of non-regular reporting institutions. <sup>5</sup> Gross market values after taking into account legally enforceable bilateral netting agreements. <sup>6</sup> Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges.

Table 2

**The global OTC foreign exchange derivatives market<sup>1,2</sup>**

Amounts outstanding in billions of US dollars

	Notional amounts				Gross market values			
	End-Jun 2001	End-Dec 2001	End-Jun 2002	End-Dec 2002	End-Jun 2001	End-Dec 2001	End-Jun 2002	End-Dec 2002
<b>TOTAL CONTRACTS</b>	<b>16,910</b>	<b>16,748</b>	<b>18,075</b>	<b>18,469</b>	<b>773</b>	<b>779</b>	<b>1,052</b>	<b>881</b>
With reporting dealers	5,907	5,912	6,595	6,836	229	237	371	284
With other financial institutions	7,287	6,755	7,210	7,602	334	319	421	377
With non-financial customers	3,716	4,081	4,270	4,031	210	224	260	221
Up to one year <sup>3</sup>	13,012	13,427	14,403	14,536	...	...	...	...
Between one and five years <sup>3</sup>	2,833	2,340	2,541	2,725	...	...	...	...
Over five years <sup>3</sup>	1,065	981	1,131	1,208	...	...	...	...
US dollar	15,141	15,410	15,979	16,509	679	704	948	813
Euro	6,425	6,368	7,298	7,819	322	266	445	429
Japanese yen	4,254	4,178	4,461	4,800	217	313	254	189
Pound sterling	2,472	2,315	2,522	2,462	78	69	112	98
Swiss franc	829	800	861	936	39	28	50	49
Canadian dollar	675	593	746	701	25	25	32	22
Swedish krona	501	551	766	708	31	18	48	31
Other	3,523	3,281	3,517	3,003	155	135	215	131
<i>Memorandum item: Exchange-traded contracts<sup>4</sup></i>	66	93	80	75	...	...	...	...

<sup>1</sup> See footnote 1 to Table 1. <sup>2</sup> Counting both currency sides of every foreign exchange transaction means that the currency breakdown sums to 200% of the aggregate. <sup>3</sup> Residual maturity. <sup>4</sup> See footnote 6 to Table 1.

Table 3

**The global OTC interest rate derivatives market<sup>1</sup>**

Amounts outstanding in billions of US dollars

	Notional amounts				Gross market values			
	End– Jun 2001	End– Dec 2001	End– Jun 2002	End– Dec 2002	End– Jun 2001	End– Dec 2001	End– Jun 2002	End– Dec 2002
<b>TOTAL CONTRACTS</b>	<b>67,465</b>	<b>77,568</b>	<b>89,995</b>	<b>101,699</b>	<b>1,573</b>	<b>2,210</b>	<b>2,468</b>	<b>4,267</b>
With reporting dealers	32,319	35,472	43,300	46,681	703	912	1,081	1,847
With other financial institutions	28,653	32,510	36,310	43,607	683	945	1,025	1,845
With non-financial customers	6,494	9,586	10,385	11,411	187	353	362	575
Up to one year <sup>2</sup>	25,605	27,886	33,688	36,950	...	...	...	...
Between one and five years <sup>2</sup>	26,308	30,566	34,458	40,161	...	...	...	...
Over five years <sup>2</sup>	15,553	19,115	21,849	24,588	...	...	...	...
US dollar	23,083	27,427	32,178	34,400	581	952	1,127	1,917
Euro	22,405	26,230	30,671	38,429	461	677	710	1,499
Japanese yen	11,278	11,799	13,473	14,691	313	304	327	379
Pound sterling	5,178	6,216	6,978	7,442	99	148	151	252
Swiss franc	1,167	1,362	1,591	1,726	18	21	33	71
Canadian dollar	785	781	859	828	15	29	24	31
Swedish krona	997	1,057	1,070	1,094	15	16	14	26
Other	2,572	2,696	3,175	3,089	71	63	82	92
<i>Memorandum item: Exchange-traded contracts<sup>3</sup></i>	<i>17,515</i>	<i>21,758</i>	<i>21,887</i>	<i>21,710</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>...</i>

<sup>1</sup> See footnote 1 to Table 1. <sup>2</sup> Residual maturity. <sup>3</sup> See footnote 6 to Table 1.