

## Why has global FX turnover declined? Explaining the 2001 triennial survey<sup>1</sup>

Global FX turnover declines between 1998 and 2001

The 2001 Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity showed that foreign exchange market turnover declined substantially between 1998 and 2001.<sup>2</sup> In April 2001, average daily turnover in traditional foreign exchange markets was \$1,210 billion, compared to \$1,490 billion in April 1998. This represented a 19% decline at current exchange rates and a 14% fall when volumes are measured at constant exchange rates (Table 1). The decline in turnover over the last three years contrasts with the findings of previous surveys, which had reported a rapid rise in forex market activity.<sup>3</sup>

Global foreign exchange market turnover <sup>1</sup>					
Daily averages in April, in billions of US dollars					
	1989	1992	1995	1998 <sup>2</sup>	2001
Spot transactions	317	394	494	568	387
Outright forwards	27	58	97	128	131
Foreign exchange swaps	190	324	546	734	656
Estimated gaps in reporting	56	44	53	60	36
Total "traditional" turnover	590	820	1,190	1,490	1,210
<i>Memorandum item:</i>					
<i>Turnover at April 2001 exchange rates<sup>3</sup></i>	570	750	990	1,400	1,210

<sup>1</sup> Adjusted for local and cross-border double-counting. <sup>2</sup> Revised since the previous survey. <sup>3</sup> Non-US dollar legs of foreign currency transactions were converted from current US dollar amounts into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2001 exchange rates. Table 1

<sup>1</sup> Les Skoczylas and Paola Gallardo provided excellent research assistance. The views expressed in this special feature are those of the author and not necessarily those of the BIS.

<sup>2</sup> The survey was conducted in April this year by 48 central banks and monetary authorities. They collected data on turnover in traditional foreign exchange markets – spot, outright forwards and foreign exchange swaps – and in over-the-counter currency and interest rate derivatives.

<sup>3</sup> The fall in aggregate turnover did not surprise market participants (see Leven (2001)).

Reported foreign exchange market turnover by counterparty <sup>1</sup>				
Daily averages in April, in billions of US dollars				
	1992	1995	1998 <sup>2</sup>	2001
Total	776	1,137	1,430	1,173
With reporting dealers	541	728	909	689
With other financial institutions	96	230	279	329
With non-financial customers	137	179	241	156
Local	316	526	658	499
Cross-border	391	613	772	674

<sup>1</sup> Adjusted for local and cross-border double-counting. Excludes estimated gaps in reporting. <sup>2</sup> Revised since the previous survey. Table 2

Among the different instruments, the decline was most pronounced in spot markets, where average daily turnover fell from \$568 billion to \$387 billion. Trading volumes in foreign exchange swaps dropped from \$734 billion to \$656 billion. By contrast, trading in outright forwards slightly increased to \$131 billion. In terms of activity between different counterparties, interbank trading fell markedly, from \$909 to \$689 billion and its share declined from 64% to 59% (Table 2). Transactions between banks and non-financial customers also fell, from \$241 billion to \$156 billion. By contrast, trading between banks and financial customers increased from \$279 billion to \$329 billion.

The main factors underlying these changes appear to have been the introduction of the euro, consolidation in the banking industry, the growing share of electronic broking in the spot interbank market and consolidation in the corporate sector.<sup>4</sup> This special feature analyses how these factors have affected foreign exchange markets in recent years, focusing on the influence on trading volumes, volatility, the tightness of bid-ask spreads and liquidity.

Four main forces at work

## The introduction of the euro

The introduction of the euro appears to have been an important factor in the reduction in turnover, because it eliminated intra-EMS trading. Admittedly, trading among EMS currencies had started to decline well ahead of EMU: between 1995 and 1998, intra-EMS trading had fallen by some 5% of global turnover (BIS (1999)). However, on 1 January 1999, the consolidation of the 11 legacy currencies eliminated roughly a further 6% of total turnover (Table 3).<sup>5</sup>

Shrinkage through elimination of intra-EMS trading

This decline was not subsequently reversed by any increase in trading in the euro compared to that in its predecessor currencies.<sup>6</sup> In April 2001, the

The euro's role matches that of its predecessors

<sup>4</sup> While exchange rate volatility is generally seen as a primary determinant of forex market turnover, it is difficult to reconcile the changes in trading volumes with the patterns of exchange rate volatility observed across currency pairs and between April 1998 and 2001.

<sup>5</sup> After elimination of double-counting.

<sup>6</sup> This finding is consistent with the conjecture of McCauley (1997) and the conclusion reached by Galati and Tsatsaronis (2001) using informal estimates by market participants.

## Foreign exchange markets and EMU

In billions of US dollars

	Turnover in 1995 <sup>1</sup>			Turnover in 1998 <sup>1</sup>		
	Total	vs US dollar	vs EMU currencies <sup>2</sup>	Total	vs US dollar	vs EMU currencies <sup>2</sup>
US dollar	1,313.4	–		1,728.9	–	
EMU currencies <sup>2</sup>	<i>869.8</i>	<i>551.4</i>	<i>201.1<sup>3</sup></i>	<i>956.5</i>	<i>704.1</i>	<i>110.2<sup>3</sup></i>
Deutsche mark	583.8	364.9	<i>106.1</i>	602.5	413.1	<i>63.4</i>
French franc	127.2	72.5	<i>51.7</i>	102.6	82.6	<i>16.8</i>
Other EMS currencies	...	...	...	223.1	185.8	<i>24.7</i>
ECU	36.2	25.2	<i>10.9</i>	28.2	22.7	<i>5.3</i>
Japanese yen	371.4	329.9		396.5	353.1	
Pound sterling	139.7	102.8		211.6	159.1	
Swiss franc	116.3	85.7		138.8	108.7	
Total	1,571.8	1,313.4		1,968.9	1,728.9	

Note: Estimates shown in italics.

<sup>1</sup> Average daily turnover, net of local inter-dealer double-counting. The table reports the turnover in which a given currency appears on one side of a transaction; consequently, each transaction is counted twice. To take this into account, the total (which also includes other and unallocated currencies) is divided by two. <sup>2</sup> Among EMS currencies, decompositions are available only for the Deutsche mark, French franc, pound sterling, ECU and the sum of all other EMS currencies. In order to estimate turnover for EMU currencies, the sum of other EMS currencies is decomposed using figures on local currency trading based on the methodology used in Table V.5 of the 67th Annual Report. <sup>3</sup> Before the start of EMU, foreign exchange transactions between prospective members' currencies were sometimes carried out using the US dollar as a vehicle. As a result, an estimation of the current importance of the euro, the dollar and the yen based on the subtraction of intra-EMU turnover in 1998 leads to an overestimation of the importance of the euro, an underestimation for the yen and a correct estimation for the dollar.

Sources: *Central Bank Survey of Foreign Exchange and Derivatives Market Activity* (1995, 1998); BIS calculations. Table 3

euro entered on one side of 38% of all foreign exchange transactions (Table 4).<sup>7</sup> This is higher than the Deutsche mark's share in 1998 (30%) but lower than that of all euro constituents taken together in 1998 (52%) and in 1995 (60%). Most of this difference can be explained by the disappearance of intra-EMS foreign exchange trading.

The relative importance of other currencies seems not to have changed substantially since 1998. The dollar's share in foreign exchange markets edged up from 87% in 1998 to 90% in 2001. The yen's share increased slightly to 23% in 2001. Dollar/euro was by far the most traded currency pair in 2001 and captured 30% of global turnover (Table 5). It was followed by dollar/yen with 20% and dollar/sterling with 11%.

### Consolidation in the banking industry

Consolidation has accelerated in recent years

A second factor that has contributed to the decline in foreign exchange market turnover is the continuing consolidation trend in the banking industry. Bank mergers, in part spurred by EMU, have led to a fall in the number of market

<sup>7</sup> This share refers to turnover in which a given currency appears on one side of a transaction; consequently, each transaction is counted twice.

Currency distribution of reported global foreign exchange market turnover <sup>1</sup>					
Percentage shares of average daily turnover in April					
	1989	1992	1995	1998	2001
US dollar	90.0	82.0	83.3	87.3	90.4
Euro	.	.	.	.	37.6
Deutsche mark <sup>3</sup>	27.0	39.6	36.1	30.1	.
French franc	2.0	3.8	7.9	5.1	.
ECU and other EMS currencies	4.0	11.8	15.7	17.3	.
Japanese yen	27.0	23.4	24.1	20.2	22.7
Pound sterling	15.0	13.6	9.4	11.0	13.2
Swiss franc	10.0	8.4	7.3	7.1	6.1
Canadian dollar	1.0	3.3	3.4	3.6	4.5
Australian dollar	2.0	2.5	2.7	3.1	4.2
Swedish krona <sup>4</sup>	...	1.3	0.6	0.4	2.6
Hong Kong dollar <sup>4</sup>	...	1.1	0.9	1.3	2.3
Singapore dollar <sup>4</sup>	...	0.3	0.3	1.2	1.1
Emerging market currencies <sup>4, 5</sup>	...	0.5	0.4	3.0	5.3
Other	22.0	8.5	7.9	9.3	10.0
All currencies	200.0	200.0	200.0	200.0	200.0

<sup>1</sup> Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%. The figures relate to reported "net-net" turnover, ie they are adjusted for both local and cross-border double-counting, except for 1989 data, which are available only on a "gross-gross" basis. <sup>2</sup> Revised since the previous survey. <sup>3</sup> Data for April 1989 exclude domestic trading involving the Deutsche mark in Germany. <sup>4</sup> For 1992–98, the data cover local home currency trading only. <sup>5</sup> For 1992 and 1995, South African rand; for 1998 and 2001, Brazilian real, Chilean peso, Czech koruna, Indian rupee, Korean won, Malaysian ringgit, Mexican peso, Polish zloty, Russian rouble, Saudi riyal, South African rand, Taiwan dollar and Thai baht.

Table 4

participants. This trend had already developed between 1995 and 1998 but has accelerated over the last three years. This is evident from the overall decline in the number of reporting banks for the 26 countries that participated in the last three surveys: 1,945<sup>8</sup> in 2001 compared to 2,205 in 1998 and 2,417 in 1995.<sup>9</sup> There is also evidence of a broad trend towards a contraction in the number of banks accounting for 75% of local turnover since the mid-1990s (Table 6). In the United States, 75% of forex market transactions were conducted by only 13 banks in 2001 compared to 20 banks in 1998 and about 20 banks in 1995. In the United Kingdom, 17 banks captured 75% of the market in 2001 compared to 24 banks in 1998 and about 20 banks in 1995. The consolidation in the banking sector has led to a reduction in the number of trading desks and in turnover, in particular in the interbank market.

Moreover, consolidation has contributed to a marked shrinkage in the number of banks that quote two-way prices on a wide range of currency pairs. There are currently not more than 20 global players in foreign exchange markets that can provide such services, a noticeable decrease compared to the mid-1990s. Market commentary suggests that the contraction in resources

Decline in resources devoted to market-making

<sup>8</sup> Preliminary.

<sup>9</sup> The numbers refer to reporting offices rather than the number of banking organisations.

## Reported foreign exchange turnover by currency pair<sup>1</sup>

Daily averages in April, in billions of US dollars and percentages

	1992		1995		1998 <sup>2</sup>		2001	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
US dollar/euro	.	.	.	.	.	.	352	30
US dollar/mark	192	25	254	22	291	20	.	.
US dollar/French franc	19	2	51	4	58	4	.	.
US dollar/ECU	13	2	18	2	17	1	.	.
US dollar/other EMS	43	6	104	9	176	12	.	.
US dollar/yen	155	20	242	21	257	18	230	20
US dollar/sterling	77	10	78	7	118	8	125	11
US dollar/Swiss franc	49	6	61	5	79	5	57	5
US/Canadian dollar	25	3	38	3	50	3	50	4
US/Australian dollar	18	2	29	3	42	3	47	4
US dollar/other	48	6	72	6	172	12	197	17
Euro/yen	.	.	.	.	.	.	30	3
Euro/sterling	.	.	.	.	.	.	24	2
Euro/Swiss franc	.	.	.	.	.	.	12	1
Euro/other	.	.	.	.	.	.	22	2
Mark/yen	18	2	24	2	24	2	.	.
Mark/sterling	23	3	21	2	31	2	.	.
Mark/Swiss franc	13	2	18	2	18	1	.	.
Mark/French franc	10	1	34	3	10	1	.	.
Mark/ECU	6	1	6	1	3	0	.	.
Mark/other EMS	21	3	38	3	35	2	.	.
Mark/other	20	3	16	1	18	1	.	.
Other EMS/other EMS <sup>3</sup>	3	0	3	0	5	0	.	.
Other currency pairs	25	3	30	3	31	2	24	2
All currency pairs	778	100	1,137	100	1,430	100	1,173	100

<sup>1</sup> Adjusted for local and cross-border double-counting. <sup>2</sup> Revised since the previous survey. <sup>3</sup> The data cover local home currency trading only. Table 5

devoted to market-making has accelerated over the last few years.<sup>10</sup> This might explain why the impact of consolidation in the banking industry on forex market turnover became visible only in 2001.

### The growing role of electronic broking

The expansion of electronic broking

Another factor that may have contributed to the contraction in turnover is the growing share of electronic broking in the interbank market at the expense of direct dealing and voice broking. The advance of electronic broking owes much to its lower costs, higher efficiency and, most importantly, greater transparency compared to traditional means of dealing. According to market sources, in the major currency pairs about 50–70% of turnover is now conducted through electronic brokers, up from 40% in 1998 and roughly 10% in 1995. Two brokers, EBS and Reuters, currently dominate this market segment, with EBS

<sup>10</sup> See also CGFS (2001a).

mostly covering trading in the US dollar, euro, yen and Swiss franc, and Reuters being used predominantly for transactions involving the pound, the Swedish krona, the Australian, Canadian and New Zealand dollars, and some emerging market currencies.

The growing role of electronic broking has contributed to a contraction in turnover in the spot interbank market through two channels. First, it has reduced trading by simplifying the price discovery process.<sup>11</sup> Before the advent of electronic broking, dealers typically had to enter a number of transactions to obtain information on prices available in the market. Traders operating through electronic brokers, by contrast, are able to know instantly the “best” price available in the market and to them, depending on their and their counterparties’ credit limits, without having to go through an uncertain price discovery process. This implies that foreign exchange dealers generally need to enter into a significantly lower number of transactions when they use electronic brokers than with traditional means of trading. This is particularly true for small and medium-sized banks, which do not have to go through bigger banks for some of their trades.

Impact on the price discovery process ...

Second, the expansion of electronic trading has reduced the scope for so-called “leveraged trading”, through which forex market dealers try to maximise profitability. To illustrate this point, suppose that a customer requests a bank to sell \$100 million against yen. The dealer would decide how to trade based on his market views. If he anticipated that the dollar would depreciate, he would probably sell more than \$100 million through the direct dealing relationships and then seek to buy the excess balance back by market-making on a reciprocal basis or through the existing voice broker network. As a result, the initial trade for \$100 million would result in turnover amounting to more than \$100 million. Market commentary suggests that the growing share of electronic broking altered this trading mechanism once the share reached a critical threshold. The concentration of liquidity with electronic brokers seems to imply

... and leveraged trading

Concentration in the banking industry							
	1992	1995		1998		2001	
	Number of participants	Number of participants	Number of banks covering 75%	Number of participants	Number of banks covering 75%	Number of participants	Number of banks covering 75%
United Kingdom	352	313	20 <sup>1</sup>	293	24	257	17
United States	180	130	20 <sup>2</sup>	93	20	79	13
Japan	330	345	24	356	19	342	17
Singapore	208	218	25	206	23	192	18
Germany	81	80	10	57	9	33	5
Switzerland	105	114	5	64	7	42	6
Hong Kong	375	376	13–22 <sup>3</sup>	366	26	272	14

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

Table 6

<sup>11</sup> See also CGFS (2001b).

that the same \$100 million order now tends to be channelled through electronic brokers, and traders are less willing to leverage customer orders. As a result, the amount of interbank trading for a given customer order has fallen. Why traders have tended to make less use of leveraged trading in recent years remains an open question.

## Changing composition of market players

Contraction in bank to non-financial customer trading ...

A further factor that explains the decline in global forex market turnover is the sharp decline in trading between banks and non-financial customers (Table 2). While its share in total trading had remained constant around 17% between 1992 and 1998, it dropped to 13% in 2001. The contraction in such activity was fairly uniform across forex centres and currencies. A possible factor explaining this result is the ongoing concentration in the corporate sector in international markets. One conjecture is that this trend may have accelerated in recent years and led to a significant reduction in the need for foreign exchange on the part of corporate treasurers.

... but expansion of activity between banks and financial customers

In contrast to the decline in activity involving non-financial customers, trading between banks and financial customers, which include pension funds, mutual funds and hedge funds, rose sharply in absolute terms and increased its share in total trading from 20% to 28%. Market commentary suggests that this rise could be attributed mainly to the increasing role that asset managers have been playing in foreign exchange markets over the last few years. This trend has been most visible in Sweden and Canada, where a relaxation of restrictions on institutional investors boosted activity.

Smaller role of hedge funds in forex markets

By contrast, market sources suggested a reduction in the number and activity of hedge funds, and in particular macro hedge funds. Macro funds, which typically take directional positions in expectation of an appreciation or depreciation of a currency, played an important role in foreign exchange markets in the 1990s. Following the LTCM episode in autumn 1998, leverage opportunities for these funds diminished sharply as a result of changing risk preferences and their creditors' drastically reducing their exposure. As a result, macro funds are reported to have withdrawn to a large extent from foreign exchange markets since end-1998 (Tsatsaronis (2000)). This trend is also evident from the fact that two families of funds that had played a key role in foreign exchange markets in the 1990s, the Tiger funds and the Quantum funds, had to liquidate or downsize their operations in the course of 2000. While there is evidence that hedge funds have been returning to foreign exchange markets in the course of 2001, their role currently appears much less important than in 1998.

## Conclusions

Four factors at work

This special feature has identified four factors that may have contributed to the decline in foreign exchange market turnover. The first factor in order of

Volatility in the major foreign exchange markets <sup>1</sup>			
	Yen/dollar	Euro <sup>2</sup> /yen	Euro <sup>2</sup> /dollar
1980–89	10.2	7.3	10.9
1990–99	11.2	10.7	9.5
1997	11.5	11.4	8.6
1998	17.5	15.4	8.2
1999	12.6	14.2	9.3
2000	9.2	16.1	13.6
2001 January–October	10.1	14.1	11.6

<sup>1</sup> Standard deviations of annualised daily returns computed over calendar months. <sup>2</sup> Prior to 1999, Deutsche mark.

Sources: ECB; BIS calculations. Table 7

importance appears to be consolidation in the banking industry, which influenced mainly interbank trading. While the trend towards concentration has been rising since the mid-1990s, it seems to have accelerated over the last three years. Second, the introduction of the euro has gradually led to a reduction in forex turnover by eliminating intra-EMS trading. It led to a decline in trading of about 5% of total turnover between 1995 and 1998, and by another 6% on 1 January 1999. Third, the growing role of electronic broking has caused a shrinkage of the spot interbank market by simplifying the price discovery process and reducing the incentives for leveraged trades. While this trend has been in place since the early 1990s, it is possible that in recent years the share of electronic broking in the interbank market has reached a critical level, at which an impact on turnover could become visible. The fourth factor explaining lower turnover is the sharp decline in trading between banks and non-financial customers. One conjecture is that it reflected increasing international concentration in the corporate sector. This trend has not been compensated by the rapid rise in activity between banks and financial customers, which appears to have been driven by the growing role of asset managers at the expense of hedge funds.

The role of concentration in the corporate sector

While these four factors have certainly contributed to a decline in foreign exchange turnover, their overall impact on market liquidity so far has not been straightforward. Since no data are available to measure liquidity directly for foreign exchange markets, indirect measures such as trading volumes, bid-ask spreads and volatility need to be considered.

Overall impact on liquidity not straightforward

In terms of the tightness of market spreads, the introduction of the euro appears not to have changed market conditions significantly. Market commentary suggests that bid-ask spreads for trading euros against other major currencies in 2001 generally matched those on Deutsche mark trading in 1998. One notable exception appears to be the euro/yen market, where spreads were reported to be wider than those on mark/yen transactions in 1998. There is also no discernible change in the pattern of volatility of exchange rates of the euro (Table 7). In addition, market participants suggest that the introduction of the euro in most cases appears not to have led to



significant changes in market liquidity. Taken together, these findings imply that the euro has not altered market conditions significantly.

The growing market share of electronic broking has certainly lowered trading volumes and narrowed spreads but its influence on liquidity appears less clear-cut. It is also difficult to see any appreciable effect of consolidation on liquidity. Nevertheless, the latter two trends do seem to imply that the interbank market is functioning more efficiently now than in the mid-1990s. However, narrower spreads and hence lower profit opportunities have led to a reduction in resources devoted to market-making. This suggests that while liquidity may have improved under normal conditions, market participants' inability or unwillingness to provide liquidity under circumstances of stress may have increased, as hinted by the fair-weather hypothesis.<sup>12</sup>

The fair-weather  
liquidity hypothesis

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<sup>12</sup> For an analysis of liquidity under stress, see Borio (2000) and BIS (forthcoming).