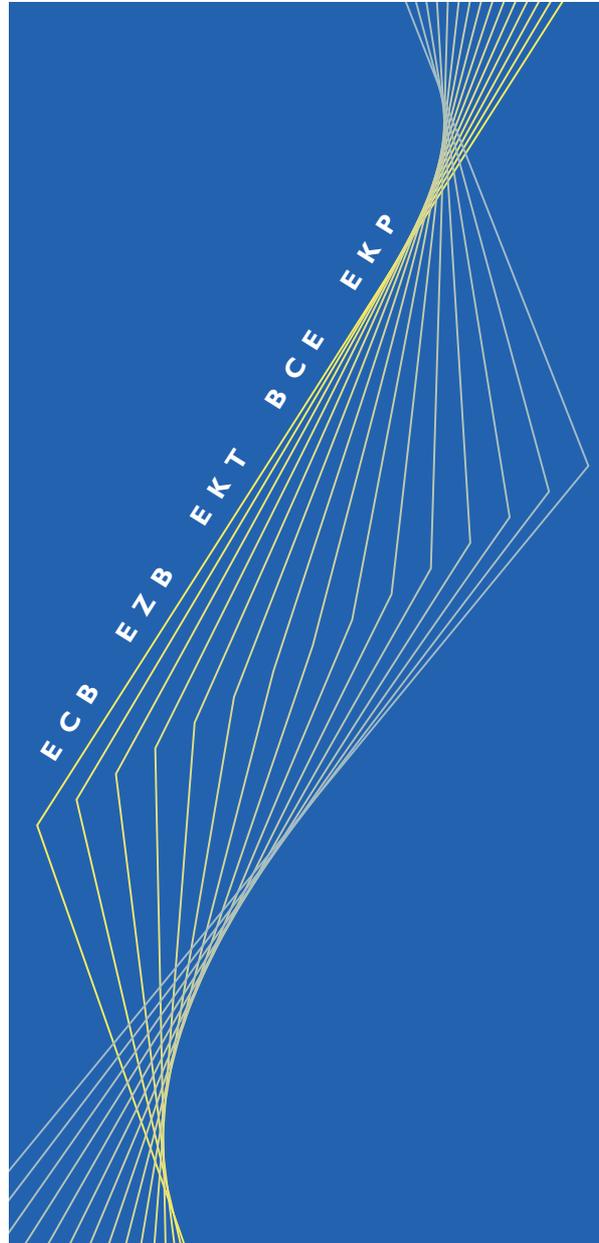




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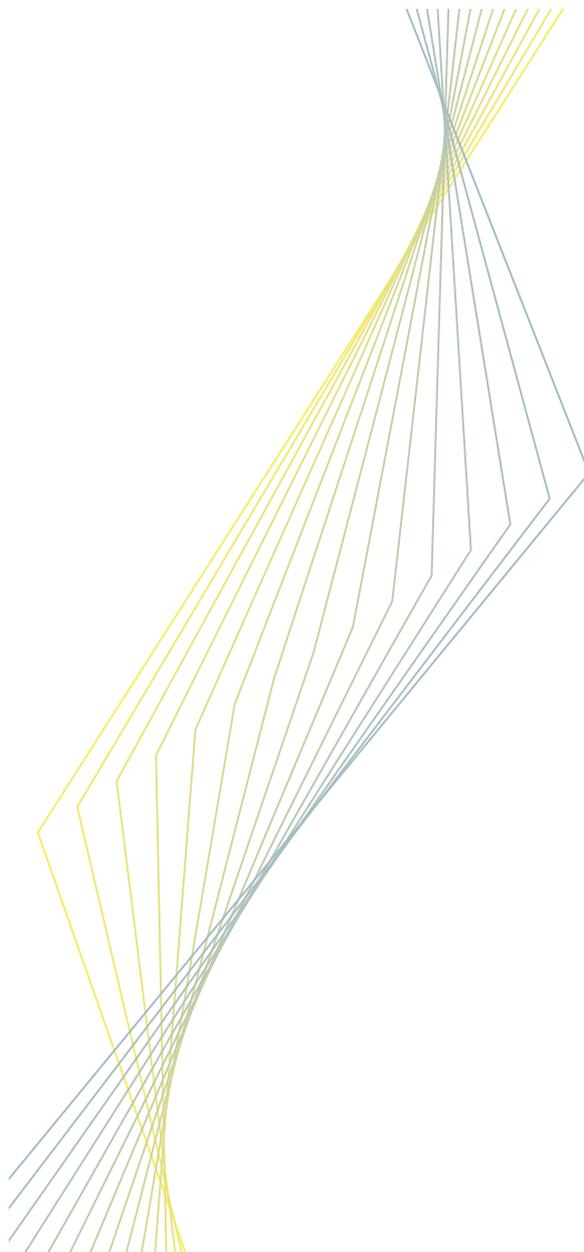


# **REVIEW OF THE FOREIGN EXCHANGE MARKET STRUCTURE**

March 2003



EUROPEAN CENTRAL BANK



**REVIEW OF THE  
FOREIGN EXCHANGE  
MARKET STRUCTURE**

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## I Executive summary

The latest triennial survey of foreign exchange (FX) and derivatives markets (April 2001) from the Bank for International Settlements (BIS) has revealed a significant reduction in overall FX market activity (down 14% at constant exchange rates). Spot transactions were the main source of this decline, while FX swaps were more resilient and outright forwards were slightly up. The 2001 survey's figures also showed substantial changes in the relative importance of trading between the different categories of market participant – interbank trading fell substantially as did trading between banks and non-financial customers (corporates), whereas transactions between banks and financial customers increased significantly. Some of these changes were caused by well identified factors such as the consolidation in the banking industry, the growing role of electronic broking and the introduction of the euro.

Some other structural changes have been further investigated through interviews with market participants whose strategies have been outlined. Banks have primarily sought to reduce operating costs in order to maintain profitability, which has been jeopardised by declining bid-ask spreads and by substantial investments in IT, communication and control systems. At the same time, most of them have engaged in a battle to increase market share, possibly with the aim of restoring their pricing power but more likely in an attempt to capture the largest customer flows.

Corporates, whose FX turnover has declined dramatically (down 36% compared with 1998), have generally rationalised their organisation by centralising their currency flows in a single treasury centre, thus reducing by internal netting the number of FX deals they need to carry out in the market. This trend has been accelerated by the introduction of the euro. Simultaneously, most non-financial customers have adopted a more conservative approach to FX risk management, sometimes motivated by the

poor results of active FX management (some big manufacturing firms suffered significant losses in the FX market during the 1990s) and further encouraged by ongoing changes in the regulatory and accounting environment (namely FAS 133 and IAS 39).

By contrast, the FX business of reporting banks with financial customers increased by 18% between 1998 and 2001. While “global macro” hedge funds (formerly among the main engines of the market in the 1990s) have, until recently at least, disappeared or become much less aggressive, other leveraged funds (such as smaller hedge funds and Commodity Trading Advisers, which are often model-based) have increased their activities.

Even more important has been the growing role of institutional asset managers, also referred to as “real money funds”, in the FX market. Increasing portfolio diversification through cross-border investments and a better understanding of FX risk by pension funds and other institutional investors have led to increased FX activity for this category of market participant (either asset managers themselves or currency overlay managers).

Liquidity in the FX market, especially in major currencies, is perceived as good, in spite of lower turnover on the spot market, because it reflects an adequate number of market participants and the absorptive capacity of the market. However, there has been a change in liquidity patterns, and some discontinuity of liquidity has been observed (“gaps” in price developments are reportedly more frequent, liquidity tends to be concentrated in the European session and liquidity in non-major currency pairs is poorer than in the past).

Looking at the foreseeable future, three major sources/engines of change, which could see the FX market gradually move towards an “exchange model”, have been identified and investigated.

First, one major feature is the ever-growing role of electronic trading systems. While dominant in interbank spot trading, electronic dealing systems have made less progress in other market segments. Similarly, online bank-to-customer platforms have not met with the anticipated success so far. However, the wider use of such trading tools is perhaps more likely once the technical and legal problems have been solved and a certain degree of consolidation and a critical mass have been achieved in Internet portals.

Second, one structural element for the FX market is Continuous Linked Settlement (CLS). CLS will eliminate FX settlement risk but it requires the making of timed payments, thus increasing the challenges for intraday liquidity management. However, given the different views expressed by banks it would be premature to make precise forecasts about the impact of CLS on financial markets at this stage.

## 2 Introduction

This study was carried out by the European Central Bank (ECB) and some national central banks (NCBs) of the European System of Central Banks (ESCB)<sup>1</sup> under the auspices of the ESCB's Market Operations Committee. It aims to investigate structural changes in the FX market, focusing mainly on the euro market segment and on the European market place.

This is the second such study of the FX market. The first one, drafted in 1999, was more limited in scope as it was basically aimed at shedding some light on trading in the new euro currency. The first study was not published in full, but an excerpt was published in the ECB's Monthly Bulletin (January 2000).

As far as methodology is concerned, the study draws on two main sources: i) the latest BIS survey; and ii) subjective information collected through interviews with a wide range of market participants or "end-users"

Third, current market dynamics suggest that further consolidation is to be expected in the banking industry (industries with high ratios of fixed costs to marginal costs are prone to long-term consolidation). Moreover, cross-border mergers have been relatively scarce so far in Europe.

The ongoing changes are a sign that the FX market is able to respond to a general demand for ever-greater efficiency. For instance, internet-based systems are aimed at reducing operating costs and increasing transparency, and the objective of CLS is to eliminate settlement risk. However, some market participants also see potential risks, such as an overconcentrated market, possible adverse effects on liquidity and exposure to the operational risks of a few key technical systems. Market participants and central banks will be watching structural developments in the FX market very closely to detect any imbalance between increased efficiency and heightened risk.

(banks, FX managers, corporate treasurers and asset managers, including insurance companies, pension funds, hedge funds and currency overlay managers).<sup>2</sup>

This study consists of six sections. The first two sections are the executive summary and introduction, and the sixth section contains the concluding remarks. The third section reviews the main facts and figures derived from the latest BIS survey and attempts to use the survey to shed light on recent developments in the euro FX market and the relative performances of European financial centres. The fourth section is based mainly on the interviews with market participants, which provide a more in-depth analysis of the reasons for the changes discussed in the third section. More specifically, the fourth

<sup>1</sup> See annex 2.

<sup>2</sup> Most of the interviews were conducted during the first quarter of 2002.

section explains the challenges facing the various categories of market participant (banks, corporates, fund managers) and describes the strategies they are implementing to adapt to a changing FX market. The fifth section looks at the ongoing

structural changes in the FX market, trying to address the issue of the development of the FX market in the coming years. For its material it draws mainly on the interviews with market participants and on the personal insight of the authors.

### 3 Main trends and conclusions of the triennial BIS survey

#### 3.1 An overall contraction of the FX market but mixed developments in its various components

The triennial survey of 48 central banks and monetary institutions carried out in April 2001 under the aegis of the BIS revealed, for the first time in the history of the survey, a significant decline in overall FX market activity. Previous surveys, covering the periods 1989-1992, 1992-1995 and 1995-1998, showed that the total “traditional”<sup>3</sup> turnover had increased by 39%, 45% and 25% respectively, which meant that the increase in the total traditional FX turnover between 1989 and 1998 was 152%. Conversely, the April 2001 survey revealed a substantial decline in total traditional turnover relative to 1998, with a fall of 19% at current exchange rates and 14% at constant exchange rates.<sup>4</sup> However, this overall reduction masks somewhat diverse trends in the various segments of the market.

Spot transactions were the main contributor to this decline. With a 32% decrease relative to the 1998 survey, they fell slightly below the 1992 level at current market rates. Other types of FX transaction recorded different developments: turnover of FX swaps decreased by only 11%, while turnover of outright forwards increased slightly relative to 1998 (up 2%). In the area of derivatives, FX options also contracted across the board, with a 31% fall in turnover relative to 1998; the decline was more apparent in USD/JPY options (down 44%) than in EUR/USD options (down 26%). Currency swaps also declined (down 30%), but from already very limited volumes.

This global decrease can be attributed to a number of factors, but most observers agree that the probable dampening impact of the introduction of the euro, the growing dominance of electronic brokers and consolidation in the banking industry are important factors. With respect to the first factor, the survey shows that although the euro accounted for a greater share of all FX transactions in 2001 than the Deutsche Mark did in 1998, it did not measure up to the total share of the Deutsche Mark and other legacy currencies combined. The phasing-out of intra-EMS trading, already noticeable in 1998, has thus taken its toll on total market turnover and seems to have been one of the most important factors at play (see sub-section 3.4).

As regards the impact of electronic trading, few doubts remain about the dampening effect on FX turnover of its growing share in transactions.<sup>5</sup> Although the market share of electronic trading systems is difficult to assess accurately, estimates by market participants range between 85% and 90% of all interbank

3 Spot transactions, outright forwards and foreign exchange swaps. Note that currency swaps differ from FX swaps in that FX swaps commit two counterparties to the exchange of two cash flows and involve the sale of one currency for another on the spot market with the simultaneous repurchase of the first currency on the forward market, while currency swaps commit two counterparties to several cash flows, which in most cases involve an initial exchange of principal and a final re-exchange of principal upon maturity of the contract, and in all cases several streams of interest payments (source: BIS).

4 Evaluation at constant rates removes the effect of exchange rate changes from the changes in nominal trading volumes.

5 Electronic broking has contributed to a contraction in turnover in the interbank spot market in two ways: first, it has simplified the price discovery process (i.e. the need for dealers to trade actively among themselves) and, second, the scope for “leveraged trading” has been reduced (see Gabriele Galati, “Why has global FX turnover declined? Explaining the 2001 triennial survey”, BIS Quarterly Review, December 2001).

**Table I**  
**Global FX market turnover**

(daily averages in April, USD billions)

	1989	1992	1995	1998	2001	% change (1998 to 2001)
Spot transactions	317	394	494	568	387	-32
Outright forwards	27	58	97	128	131	2
FX swaps	190	324	546	734	656	-11
Estimated gaps <sup>1)</sup>	56	44	53	60	26	-57
Total	590	820	1,190	1,490	1,200	-19
Currency swaps	–	–	4	10	7	-30
Options	–	–	41	87	60	-31

Source: BIS.

1) Gaps in reporting stem from two sources: incomplete reporting in the countries providing data, and less than full coverage of the range of countries in which the surveyed activity takes place.

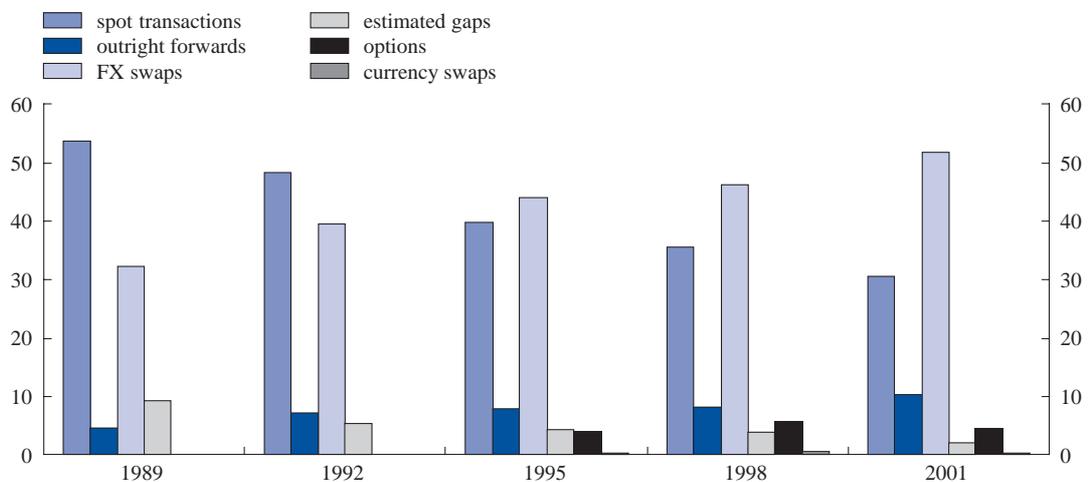
spot market transactions for the major currency crosses. Last but not least, the consolidation seen in the banking industry has also been instrumental in this process.

In addition to these structural factors, some observers have suggested that a comparison between the April 1998 and April 2001 figures might give a distorted picture. The first half of 1998 saw a high level of activity on the FX and derivatives markets. This

subsequently moderated when the Russian crisis and the demise of the Long-Term Capital Management (LTCM) fund triggered a de-leveraging of market participants' exposure, which, of course, had an impact on FX market turnover. However, according to monthly data from Electronic Broking Services (EBS), April 2001 turned out to be an average month for FX trading, so there is no evidence of distortion as a result of using this specific month for the survey.

**Chart I**  
**FX market turnover**

(at constant exchange rates (April 2001), as a percentage of the total)



Source: BIS.

### 3.2 Declining activity in the interbank market and a sharp fall in corporate activity, but growth in financial customer business

There were some changes in the share in total turnover of different types of market participant. Despite different perceptions in different market places, the data reveal an across-the-board decrease in overall activity, including a large decline in interbank trading (the largest area of trading, at least in absolute terms). Trading between “reporting dealers” fell substantially, from USD 908 billion to USD 689 billion. As discussed above, this can be explained by the growing role of electronic brokers in the interbank spot market (changing the traditional function of market making) and by the growing concentration in the banking industry.

Evidence of this consolidation process comes from the number of reporting banks in the BIS survey (for countries which participated in the last three surveys), which decreased from 2,417 in 1995 to 2,205 in 1998 and to 1,945 in 2001. In addition, there is evidence of increased concentration of turnover amongst the largest players. For example, 75% of turnover is now conducted by just 13 banks in the United States and 17 banks in the United Kingdom, compared with 20 and 24 respectively in 1998. There is also a widening gap between global banks and small banks.

Transactions between banks and non-financial customers also shrank, from USD 242 billion to USD 156 billion. This development may partly stem from the concentration process in the corporate sector, with the centralisation of corporate treasury functions and the consequent internal netting of FX flows. It may also be rooted in the speeding-up of cross-border consolidation in the corporate sector over the last few years. The magnitude of cross-border mergers and acquisitions (M&A) activity in 1999-2000 may have temporarily slowed the decrease in reported transaction volumes initiated by traditional customers, but the relatively low number of “mega deals” (big cross-border mergers and acquisitions) in 2001 magnified the fall in corporate activity.

Trading between banks and financial customers increased from USD 279 billion to USD 329 billion. This may reflect the increasing role of asset managers and the growing international diversification of their portfolios, which is discussed in sub-section 4.3 below.

As a result of these developments, the share of interbank trading in total turnover declined from 64% to 59%, while the share of bank to non-financial customer trading fell from 17% to 13%, and the share of business between banks and other financial customers rose from 20% to 28%.

**Table 2**  
**Reported FX market turnover by counterparty**

(daily averages in April, USD billions)

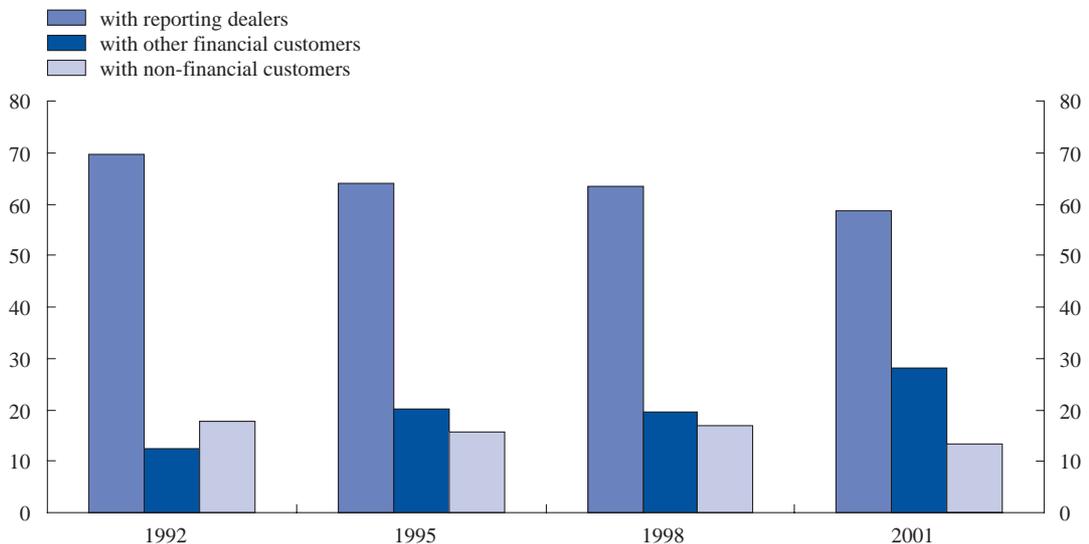
	1992	1995	1998	2001	% change (1998 to 2001)
With reporting dealers	540	729	908	689	-24
With other financial customers	97	230	279	329	18
With non-financial customers	137	178	242	156	-36
Total	774	1,137	1,429	1,174	-18
Domestic	346	526	657	499	-24
Cross-border	428	611	772	674	-13

Source: BIS.

## Chart 2

### FX market turnover by counterparty

(as a percentage of reported turnover)



Source: BIS.

### 3.3 Overall stability in the ranking of the various financial centres but with significant overperformance by a few market places

The market shares of the main financial centres remained more or less stable between 1998 and 2001. The euro area accounted for 14.8% of overall activity (against 17.2% in 1998 on an aggregate basis), putting it in third place below the United Kingdom (31.1% against 32.5% in 1998) and the United States (15.7% against 17.9% in 1998). Japan accounted for 9.1% of global turnover (against 6.9% in 1998). The European Union (EU) as a whole accounted for 48.8% of overall activity (against 52.7% in 1998).

The decline in turnover was smaller in the two principal trading centres, the United States (down 28%) and the United Kingdom (down 21%), than in the euro area (down 30%), which was affected by the disappearance of intra-euro area trading. Turnover fell in all EU countries except Sweden, where the change in the regulation of pension funds and the introduction of the euro led to a rise in the volume of SEK-denominated spot trading. In Sweden the period under observation was characterised

by large FX movements and anecdotal reports suggest that significant investment outflows might have resulted in larger than usual turnover in the FX market. Germany resisted the contraction in volumes better than other euro area countries due to the return of the trading activities of some large German banks to Frankfurt and its former traditional position as a leading centre for Deutsche Mark FX transactions.

Some smaller non-European market places saw an increase in turnover, mainly in response to the diversification needs of asset managers. For instance, in Canada, similar legal adjustments to those in Sweden resulted in an increase in its share of total turnover. The renewed interest of market participants in "peripheral currencies" is also believed to have increased turnover in these currencies. The disappearance of the legacy currencies of the euro put greater focus on trading activities involving other European currencies and currencies of other economies, such as the "dollar-bloc" currencies of Australia, New Zealand and Canada. This shifting focus might have contributed to the rising global market shares of some local market places, such as Sydney, together with the concentration of

activities in this centre for a number of Asian and neighbouring currencies.

It is also worth mentioning the noticeable rise in Japan's share of global FX turnover (up 8%), where some special factors seem to have been at play. A more detailed analysis shows that most of this increase came from a surge in cross-border FX swaps, masking an actual decrease in spot transactions. These vehicles are heavily used in "carry-trades" in particular, where market players borrow in low-yielding currencies to invest in high-yielding assets. It was also suggested that money-market arbitrage seeking to take advantage of varying funding conditions between the local market and overseas Japanese yen markets also inflated FX swap books. The use of swaps as a funding vehicle by Japanese banks may also have been a significant factor.

### 3.4 The euro FX market

The Triennial Central Bank Survey is the first comprehensive assessment of FX market activity since the introduction of the euro. According to the survey, the euro was the second most widely traded currency behind the US dollar (90%) and ahead of the Japanese yen (23%), appearing on one side of 38% of all traditional FX transactions. This share is higher than the share for the Deutsche Mark in 1998 (30%), but lower than the aggregate share of the legacy currencies in April 1998 (53%) (see Annex I, Table I). The decrease in market share is mainly attributable to the elimination of intra-euro area FX trading, which was an automatic consequence of the introduction of the euro.<sup>6</sup> Another factor is consolidation in the banking sector, partly prompted by Economic and Monetary Union (EMU). Similarly, for spot transactions in isolation, the euro is the second most traded currency, taking a 43% share compared with 84% for the US dollar. This share was almost the same as that of the Deutsche Mark in 1998 (42.7%). EUR/USD was by far the most traded currency pair, accounting for 30% of global turnover, followed by USD/JPY (20%)

and GBP/USD (11%). By comparison, the USD/DEM market share in 1998 was 20% (see Annex I, Table 2).

Table 3 in Annex I shows simulated euro turnovers (simulated by eliminating intra-euro area trading and aggregating the external turnovers of the legacy currencies) from the last four BIS surveys for spot transactions, outright forwards and FX swaps (Detken and Hartmann, 2002<sup>7</sup>). According to this simulated data, euro spot trading fell by 34% in 2001 compared with 1998 (aggregated legacy currencies). This closely matched the 32% reduction in global spot turnover during the same period. For outright forwards, trading in euro remained very similar to that of the aggregated legacy currencies, while the global volume was also little changed. For FX swaps, however, the estimated trading volume for the euro fell by 35%, which was far greater than the decrease in global turnover (11%), but its share was still much higher than that of the Deutsche Mark.<sup>8</sup>

Looking at the role of the euro in FX markets, various aspects can be considered, such as turnover, bid-ask spreads, volatility and the role of the euro as an anchor/reserve/intervention/invoicing currency.<sup>9</sup> In this section, however, developments in turnover are the main focus of the analysis. The euro's share of turnover is either at or above the corresponding share for the Deutsche Mark in 1998, depending on the market segment, but often below the aggregate share of the legacy currencies. The euro is traded predominately against the US dollar, while the combined market share of other currency pairs involving the euro have remained

6 This decrease was all the more pronounced because the share of intra-euro turnover consisting of cross operations via the Deutsche Mark automatically disappeared, since trades between most other currency pairs (e.g. ITL/FRF) had been carried out as cross operations via Deutsche Mark and therefore gave rise to two transactions.

7 Detken and Hartmann, "Features of the euro's role in international financial markets", *Economic Policy*, October 2002

8 Detken and Hartmann (2002) list the following three reasons for the bulk of the reduction: 1) An arithmetic effect from the pre-stage 3 technique to square open legacy currency positions through USD swaps; 2) a final peak of the interest convergence "play" in spring 1998; 3) financial innovations.

9 See the report "Review of the International Role of the Euro", December 2002

relatively small, reflecting the fact that the US dollar remains the main vehicle currency in the FX markets. In emerging markets, too, the US dollar has remained the dominant currency, with the exception of some EU accession countries where the euro has played a more significant role. In particular, the euro captured the largest market shares in Hungary and Slovenia and large market shares in the Czech Republic, Slovakia and Turkey, but it continued to be outweighed by the US dollar in Poland (data is not available for all accession countries).

Turnover data also show that 27% of all euro transactions with other currencies were reported by euro area countries, compared with 34% by the United Kingdom, 16% by the United States and 4% by Japan. Other countries accounted for 19% (USD 116 billion). In the case of the US dollar, 16% of transactions were reported by the United States and 29% (USD 427 billion) by countries other than the United States, euro area countries, the United Kingdom and Japan.

## **4 Market participants – activity and strategies**

### **4.1 The banking industry**

#### **4.1.1 Trends and strategies**

As indicated at the beginning of this study, the FX market undergone important changes over the last decade that have influenced the way banks act in the market. It has become increasingly difficult to make money through straightforward transactions on everyday flow business, since fierce competition has put pressure on spreads, especially for smaller deals.

The ongoing consolidation in the corporate and financial sectors is another vital process changing the way banks act in the FX market. Consolidation has contributed to a more efficient approach to the handling of FX flows within groups and to the rationalisation of treasury functions. Treasury operations have been centralised and FX flows are now to a large extent netted within companies, thereby minimising the need to channel these flows through banks. This has been reinforced by the fact that some corporates seem to be less inclined to take on risk – a change in attitude that has reduced FX flows motivated by pure position-taking (see sub-section 4.2).

At the same time, the larger companies resulting from this consolidation process are, to an increasing degree, looking to deal in wholesale amounts with banks offering a full

range of financial services. Larger trading houses have thus become more important, as customers have channelled their flows towards those banks able to supply quick and accurate pricing and a wide range of financial services (“one-stop shopping” for financial services). This means that banks are not only competing on a quantitative basis, but also to a large extent on a qualitative basis.

To cope with these changes, banks are trying to enhance their market share and develop closer relationships with customers. They are also trying to reduce costs, since the need for substantial investments in technology has made it necessary to reduce costs elsewhere in order to ease pressure on profits. From the banks’ point of view, these strategies are normally part of an integrated approach to FX trading and are therefore not treated as separate issues. They will thus be covered in an integrated fashion in the remainder of this section.

At the same time, the profitability of FX trading-related activities seems to have undergone major changes in recent years. Although flow-driven position-taking is still a major source of revenue for banks, in particular for those which have benefited from the consolidation-driven concentration of flows, fees paid by customers and other sources of revenue generated by the provision of services to customers have

assumed greater importance. New activities, such as prime brokerage, currency overlay management, access to electronic trading platforms and global custody services, give banks an opportunity to cushion the impact of position-taking activities, whose profit and loss patterns are, by their very nature, rather volatile.

#### **4.1.2 The search for larger market shares**

Traditionally, FX trading has been a non-commission business, where banks earned money from the spread on each transaction. As spreads have become thinner this strategy has become more difficult. One obvious response from banks hoping to maintain profits is to try to increase their market share, which partly explains the ongoing consolidation within the banking industry. The rationale for this is that if a bank is able to capture a large enough share of the huge FX market it will still be able to earn money from the high volume of transactions, in spite of low margins on each trade. To do this a bank needs global presence, a well-developed infrastructure and a relatively large sales force. This quest for greater market share is also driven by the fact that the larger the volume of flows captured by a bank, the more that bank will be able to profit from “leveraged trading” (i.e. using customer flow information to inform position-taking). This also explains the view expressed by interviewees that larger banks seem to devote roughly the same amount of resources, in terms of both staff and risk capital, to proprietary trading as before, while smaller banks seem to have become less inclined to take risks. A possible explanation is that the volume of flows generated by smaller banks is not sufficient to gather the information needed.

#### **4.1.3 Closer relationships with customers**

Another response to this competitive environment is to treat FX trading as an integral part of a bank’s overall strategy. From

this point of view, FX trading is one way to attract customers in order to do more profitable business with them in a range of other financial products. Conversely, clients dealing with other divisions of a bank can also be channelled to the FX division if they have need of an FX transaction. This cross-selling of services to clients across the bank has thus become a priority. In order to achieve this goal, banks are trying to form closer relationships with their customers, which means that banks are increasingly competing on the basis of their ability to give customers profitable and strategic advice as well as value-added services.

To meet these demands, traditional FX traders have been retrained to become salesmen and banks have hired staff able to price and trade more complicated products. Therefore banks have redirected resources from traditional trading desks, and to a lesser extent from sales desks, to more value-added functions. It also means, for example, that the FX division works more closely with the investment banking division to ensure that FX transactions resulting from mergers and acquisitions and other investment banking activities are carried out by the bank originating the deal.

This redirection of human resources towards more qualified services has been facilitated by the development of electronic trading (see sub-section 5.1 and Box 2). These systems have made it possible to separate the execution of simple transactions from services with greater value-added and also allowed banks to deliver these services to a wider customer base. So far these systems have only proved an unmitigated success in the interbank market, where they have captured an estimated 85% to 90% of spot transactions in the major currencies.<sup>10</sup> Even so, many banks have developed their own business-to-customer (B2C) trading systems, on which clients can carry out trades and

<sup>10</sup> The most important systems are Electronic Broking Services’ spot dealing system, commonly called EBS, and the Reuters dealing system.

access the bank's research in different fields. Some banks have been successful in transferring a significant quantity of deals, particularly their smaller ticket customer deals, to their proprietary electronic trading systems, and have even used these systems to increase customer volumes. However, looking ahead it is generally expected that, although smaller clients who execute most of their business through one or a handful of banks will still benefit from single-dealer platforms, multi-dealer platforms where several banks are entering prices will be preferred, and that electronic trading may eventually prevail over traditional means of trading, with the possible exception of very large deals. This will probably have a profound effect not only on front-office personnel, but also middle and back-office staff, since many of these systems offer, or will offer, straight-through processing (STP).

While attempting to build closer relationships with their clients, banks are at the same time trying to persuade customers to work on an order basis only (an order to buy or sell a specified volume at a specific time) instead of requesting simultaneous quotations of bid and ask rates. Through this more co-operative/less aggressive practice banks would get more time to execute the transaction, which in turn could result in a better price for the customer.

In this context the use of prime brokerage should also be mentioned, even though it is still in its infancy, at least in Europe. Prime brokerage is an arrangement under which customer deals are cleared through a single counterparty, being executed with third-party banks in the name of that counterparty. In the United States, where this practice is more common, it is used in particular by institutional funds (for more details, see Box 5).

#### **4.1.4 Cost reduction**

Consolidation is not only motivated by the quest for a larger market share, it is also a

key part of the drive to reduce the costs generated by FX dealing. In order to be competitive in the new environment, banks need sophisticated hardware and software, entailing costly investments in advanced IT systems. Thus the realisation of economies of scale in treasury and FX activities is a major driving force of the merger activity, both cross-border and domestic, currently prevailing in the European banking sector.

The centralisation of FX functions is an important part of this strategy and has perhaps been facilitated by the introduction of the euro and improvements in communication between banks and their customers. It is no longer essential to have trading rooms in a number of different locations around the euro area. Instead, banks have concentrated their euro dealing and treasury activities in a single centre while, in some cases, retaining sales staff dedicated to FX products in a few "regional desks", thus giving the impression of maintaining trading activity in the locations concerned. Some euro area banks have repatriated FX dealing to their home base, while other international banks have concentrated their euro business in London.

#### **4.1.5 Changing market structure**

Fiercer competition and more demanding customers may have far-reaching consequences for the structure of the market. First, the ongoing process of consolidation is likely to continue, a prediction that is supported by the fact that consolidation in the banking sector still lags behind that in the corporate sector and that economies of scale are still possible. Second, the pressure on small and medium-sized banks to pull out of the interbank market will most probably intensify, partly as a consequence of the fact that the euro has deprived them of the niche business previously available to them in their national currencies. Furthermore, the scope for these banks to rationalise their activities in order to reduce costs is much smaller than for larger banks, making it increasingly difficult

to meet the demands of customers in the FX market. By pulling out of the interbank market, these banks may be able to free up resources to exploit other niches, such as emerging countries' currencies. This also implies that in future the interbank market will be the reserve of the largest players.

This development may also result in larger banks taking over the administration of the FX activities of smaller banks and of companies. This type of outsourcing of activities (including middle and back-office operations) can already be observed in the United States. For smaller banks and companies, this offers an opportunity to increase efficiency and to better allocate resources.

## 4.2 Changing strategies in corporate financial activity

### 4.2.1 Declining corporate FX turnover

As seen above, the 2001 BIS survey revealed a substantial decline in non-financial customer business. Traditional FX trading conducted by corporates has declined substantially compared with the previous survey (down 36%). Indeed, daily turnover in 2001 was below the daily turnover recorded in 1995 (see Table 3). As a result, trading between banks and non-financial customers accounted for only 13% of global FX turnover in 2001, down from around 17% in 1998, 1995 and 1992.

The contraction in such activity was fairly uniform across financial centres and currencies but not across market segments: while spot and FX swaps fell markedly, outright forwards were more resilient. On the derivatives side, options business initiated by corporates also fell.

### 4.2.2 The causes of declining corporate FX turnover

Corporates as such are not a very homogenous group of market participants. Their strategies and practices in terms of FX business can vary significantly depending on their core business, size, country of origin and own corporate culture. However, some general trends can be observed which show that this diversity should not be overstated.

One cause of the fall in non-financial customers' activity is increased concentration in the corporate sector. Certainly some large M&A deals have occasionally inflated FX turnover, but it seems that the direct impact of such deals on turnover and on exchange rate movements may have been overestimated, as most of them did not involve cash payments and therefore did not generate FX transactions (see Box 1).

In any case, most of the "mega deals" were announced in 1999 and 2000, while 2001 was a quiet year in this respect. Consolidation in 2001 probably had a negative impact on turnover overall.

**Table 3**  
**Corporate FX turnover<sup>1)</sup>**  
(daily average in April, USD billions)

	1992	1995	1998	2001
Spot	62.0	74.8	99.4	58.3
Outright forwards	27.9	35.6	44.3	37.4
FX swaps	47.0	67.8	98.3	60.1
Traditional FX transactions	136.9	178.2	242.1	155.9
FX options	–	0.8	2.2	1.8
Currency swaps	–	7.1	21.4	16.0
Total	–	186.1	265.7	173.7

Source: BIS.

1) Reported FX spot and derivatives transactions with non-financial customers.

## Box I

### Merger and acquisition activity of corporates<sup>1</sup>

In the years 1999 and 2000, M&A activity was considered to be one of the driving forces behind exchange rate movements. In order to find out to what extent this perception is correct, a closer look must be taken at the actual activities of corporate treasurers.

The total volume of cross-border M&A activity in 1998 was USD 710 billion. In 1999 this volume rose sharply to USD 1,348 billion. In 2000 a similar level was observed. Of all the M&A related capital flows in 2000, 44% (by value) originated in the euro area, and most of these were directed towards the United States. Only 20% (by value) was of US origin. This resulted in a net outflow of USD 270 billion for the euro area and a net inflow for the United States of USD 170 billion.

An M&A deal can be funded in four different ways: by using available cash, by issuing debt, through bank loans or by issuing/transferring shares (or through a combination of two or more of these methods). Only the first three methods involve a cash payment. The fourth does not involve an FX transaction. In addition, when using one of the first three methods, the deal can be financed in the local currency of the targeted company, which would also not entail an FX transaction.

The instruments used for the FX part of M&A financing are largely determined by the attitude of the corporate treasurer towards FX risk. Three approaches can be adopted for the management of FX risk in M&A deals. The first involves early action by the treasurer to guarantee a fixed exchange rate during the negotiation of the deal. The second entails the treasurer hedging the FX risk when the deal is finalised. A third approach is to spread the FX hedging out over a longer period of time after the deal is finalised. As the negotiations can take quite some time, the instruments used for the first approach are more complex than for the latter two.<sup>2</sup> However, it was found that the choice of hedging instrument, such as forward contracts, options or plain spot transactions, did not in itself have any effect on the exchange rate.

The announcement of an M&A deal often results in a movement of the exchange rate, even if it is not accompanied by large FX transactions at the time (as might be expected in a forward-looking FX market). According to the interviewed treasurers, the cash-flow effect of M&A transactions was systematically overestimated. It was felt that only very large transactions or transactions in illiquid markets had an actual effect on the exchange rate.

<sup>1</sup> A summary of an article by M. A. Schrijvers (De Nederlandsche Bank) in Banca Nazionale del Lavoro's *Quarterly Review*, March 2002, based on interviews conducted with a number of the top-50 European companies.

<sup>2</sup> The negotiation period of the companies interviewed for the article varied from one to nine months.

Along with consolidation, the centralisation of flows by corporates has led to a significant reduction in the need for foreign exchange on the part of corporate treasurers. Big multinational firms have increased the centralisation of their FX and treasury operations: every currency inflow or outflow from any branch or subsidiary is routed via a single treasury centre, which allows the company to net payment flows and thus reduce the number of FX deals that have to be done in the market. In Europe, the introduction of the euro accelerated this

general trend. Before monetary union only a handful of legacy currencies used the ECU to net their internal flows and to globally (but approximately) hedge their currency exposure. Since January 1999 the euro has been the domestic currency of a number of big European firms, leading to an automatic decline in their foreign exchange requirements.

Consolidation, a centralisation of flows and the introduction of the euro are some of the objective factors behind the overall decline

in corporate FX activity. A more qualitative explanation for the fall in turnover with non-financial customers seems to be the more conservative/less dynamic approach to the management of FX risk adopted by firms. A number of the corporate treasurers interviewed by the study group reported that their firms' senior management was increasingly risk-averse. They have clearly refocused on the firms' core business, while their appetite for market risk has declined substantially.

This general trend can be explained by three different factors. First, some industrial groups suffered significant losses in the FX market during the mid and early 1990s. Some of these cases have been widely publicised as they involved some misconduct by financial departments, while some others were handled more discreetly. In both cases past FX losses have encouraged more professional management of financial risks, with the result that the financial skills of the business community are much more developed today than they were ten years ago. Accompanying this has been a reduction in the appetite for risk and thus fewer transactions.

Second, it seems that banks are in a better position to price the liquidity they offer as market makers. According to some corporate treasurers, transaction spreads have not widened but banks have nevertheless convinced their customers to deal more often on an order basis, especially for large transactions. It seems that the ability or the willingness of some big corporates to "spoof" or squeeze the market in less liquid currency pairs has been reduced over the years. Nevertheless, some banks reported occasional "aggressive" corporate trading in some niche markets (especially in the Scandinavian currencies).

Third, the ongoing changes in the regulatory and accounting environment (e.g. FAS 133 and IAS 39) have obliged corporates to comply with more restrictive rules with

regard to "hedging" (see Box 3). The international accounting standard IAS 39 and the US accounting standard FAS 133 (for US firms and European firms listed in the United States) oblige firms to document more precisely their hedging transactions, or conversely to mark-to-market their "macro-hedge" positions (i.e. hedging deals not related to specific underlying transactions). These new accounting standards, while designed to prevent firms from taking excessive speculative positions (or at least to ensure that whatever risks companies do take are transparent to shareholders), might also lead them to leave some currency exposure unhedged. Indeed it is argued that for corporates it would be too costly to put in place adequate systems and documentation. Furthermore, internal procedures might also be prohibitive (for example delays resulting from requirements for decisions on individual deals to be put before a company's Board of Directors). All in all, some corporates may prefer to accept market risks rather than suffer the high costs and accounting risk which, ironically, could result in increased volatility in the firms' P/L accounts. These pessimistic views on the impact of FAS 133/IAS 39 were not held unanimously, but were expressed by some interviewees.

As already mentioned, "corporates" are not a homogenous population and their attitude towards market risk is not uniform. Indeed, the function of the corporate treasurer is not the same in all firms. While most have assigned the task of hedging or at least reducing the firm's market exposure to the financial department, some view this as an autonomous profit centre whose objective is to boost the firm's profitability through the active management of FX exposure and other market risks. However, only a minority of the treasurers interviewed headed up departments that acted as a proxy "hedge fund" or had a more limited own-trading activity. It therefore seems that the general trend towards a reduced appetite for risk is not in doubt.

## Box 2

### E-commerce and non-financial customer FX business

In the late 1990s, big international banks spent a lot of money developing their own proprietary systems (electronic single-dealer platforms). The objective was to meet customers' needs for competitive pricing at a lower cost for the bank (making FX sales less labour-intensive), while offering to end-users a better service in terms of STP. The single-dealer system can also be used internally for a bank's in-house trading activities. As a number of large banks have recently restructured their branch FX activities, local branches now often trade foreign exchange through the bank's single-dealer system with the head office or main trading centre.

However, electronic platforms encountered development problems that delayed their full introduction. Moreover, they were less popular among customers than banks had expected. The reasons were both technical (security standards were not always available from the beginning) and psychological (customers were reluctant to be dependent on a single price maker). Thus so far the success of proprietary platforms has been limited (a handful of platforms were spontaneously mentioned by corporate treasurers during interviews, but their aggregate market share is probably no more than a few per cent).

To overcome customer resistance to single-dealer platforms, various alliances of banks and other vendors launched multi-dealer platforms at the beginning of 2000. The best known of these are Currenex and FX All. The first was set up by a group of institutional investors, corporates and banks, and the second is an initiative of a syndicate of large banks in the FX market. But again, so far their commercial development has been slower than their promoters had hoped. Although they are viewed more favourably by corporates because of the opportunity to make several banks compete for a bid or an ask, multi-dealer platforms have met some resistance for a number of reasons.

First, customers are keen to maintain the quality of the advisory services they receive from their banks and for this reason treasurers prefer to maintain a good business relationship with the FX sales team.

Second, some of the marketing features of the multi-dealer systems have not proved sufficiently attractive. For example, STP is not always regarded as providing a decisive competitive edge, as corporates have their own efficient back-office systems and/or do not have a lot of tickets to input. Sometimes internet-based systems are also considered slower than direct dealing by phone.

Third, customers seem to think that no system has yet reached critical mass. They want to obtain liquidity through a single point of access and are therefore waiting for consolidation among the various competitors before committing to one of them.

However, the spontaneous trend towards consolidation, as illustrated by the recent disappearance of Atriax (a former competitor to FX All and Currenex), has been called into question by competition regulators, and the US Department of Justice is investigating allegations of anti-competitive behaviour by various joint-ventures in online bond and FX trading (see Financial Times, 16 May 2002, "Banks face US probe on electronic trading").

In conclusion, it seems that there is still some scope for the expansion of internet-based dealing systems. Electronic systems are generally viewed as a valuable complement to direct contact by telephone but they have so far failed to attract a significant share of corporate FX business.<sup>1</sup>

<sup>1</sup> No data is available, but market participants' estimates tend to show that neither proprietary nor multi-dealer platforms account for more than a few per cent of total turnover. As electronic systems are more popular for small and medium-sized deals, the share in the number of deals is probably larger, particularly for those banks with the most popular proprietary systems.

### Box 3

#### Impact of FAS 133 and IAS 39 on FX risk management for non-financial customers

The US Financial Accounting Standards Board and the International Accounting Standards Board have issued comprehensive standards for recognising and measuring financial instruments: FAS 133 and IAS 39. FAS 133 is applicable as of 1 January 2001 to companies subject to US GAAP financial standards (including European companies listed on US exchanges). IAS 39 will be implemented gradually. Thus, on 12 March 2002, the European Parliament endorsed the European Commission's proposal that all EU-listed companies must comply with the standards issued by the International Accounting Standards Board in their consolidated financial statements by no later than 2005. Member States are permitted to decide whether non-listed companies must also comply with IAS 39. Companies that are listed both on EU and non-EU exchanges and that are subject to another set of internationally accepted standards may be exempted until 2007.

In practice, the International Accounting Standards Board and the US Financial Standards Board have adopted quite similar standards for recognising and measuring financial instruments. The main principles are:

**Scope:** under both IAS 39 and FAS 133 all financial assets are assessed at fair value, except for loans and receivables originated by the company itself and financial assets held to maturity or whose fair value cannot be reliably measured. This definition includes financial assets held for trading, all securities available for sale and all derivative assets.

**Hedge criteria:** hedge accounting is permitted in certain circumstances, provided that the hedging relationship is clearly defined, measurable and effective.

For accounting purposes hedging means:

- designating a derivative financial instrument or (for hedges of FX risks) a non-derivative financial instrument as an offset to the change in the fair value of a specific hedged item;
- measuring reliably the effectiveness of the hedge; and
- testing it continuously.

Macro-hedging is not recognised by either IAS 39 or FAS 133. Hedge accounting is permitted only if a company designates a specific hedging instrument as a hedge against a change in the value or cash-flow of a specific hedged item, rather than as a general hedge against changes in an overall balance sheet position.

**Hedge accounting methods:** two main methods can be distinguished. The first, called fair-value hedging, has a direct impact on the profit and loss account, while the second, called cash-flow hedging, has a temporary impact on the balance sheet, especially on shareholders' equity:

- The fair-value hedge accounting method relates to the hedging of the exposure to changes in the fair value of a specific asset or liability (such as a hedge of exposure to changes in the fair value of fixed-interest debt as a result of changes in interest rates). The gain or loss from revaluing the hedging instrument at fair value is reflected directly in the profit and loss account. At the same time, the gain or loss on the hedged item is also reflected directly in the profit and loss account.
- The cash-flow hedge accounting method relates to the hedging of forecast purchases or sales. The portion of the gain or loss on the effective hedging instrument is reflected first in shareholders' equity and then transferred to the profit and loss account in the periods in which changes in the value of the hedged item are recorded in the profit and loss account. Note that hedging of a net investment in a foreign entity is included in the cash-flow hedging method, as are conditional buy or sell orders.

### 4.3 Financial customers – a heterogeneous population

An interesting finding of the BIS survey, as can be seen above, was that the reporting banks' FX business with financial customers increased by 18% between 1998 and 2001, while interbank turnover and business with non-financial customers both fell. In most cases these financial customers will be asset managers. The asset management community covers a wide variety of institutions with, potentially, differing attitudes to FX risk and to operating in FX markets, including:

- in-house asset managers, such as pension funds and insurance companies;
- commercial asset management companies;
- currency overlay managers, and;
- leveraged funds, such as hedge funds and CTAs.

The experiences of the interviewed market participants were consistent with the BIS survey findings, although one mentioned that the generally poor performance of equity markets since April 2001 might have led to some reduction in funds' FX activities. Developments in the FX activities of leveraged and institutional funds are described in more detail below.

#### 4.3.1 Leveraged funds

The nature of leveraged fund activity has changed in recent years, particularly since 1998. The most significant funds in the mid to late 1990s were the "global macro" hedge

funds that were known for taking very large positions in FX and other markets on the basis of a fundamental market view, often a "contrarian" one, and with a medium-term investment horizon. In recent years the total number of leveraged funds has increased,<sup>11</sup> but they tend to be much smaller both in terms of the value of funds under management and the degree of leverage applied. Many of the new funds are CTAs (see Box 4).

The trading style of these new funds is also different. Many of them deal using proprietary models that deliver trading signals on the basis of quantitative inputs. Often these models use only historic price information, an example being momentum models (trend followers), which generate trading signals when prices move through historic moving averages. Other signals used by technical analysts to try to identify price trends may also be incorporated. These models are often retained as "black boxes", either because they are not based on any fundamental model of fair value or equilibrium or, more particularly, because the algorithms transforming the price inputs into trading signals are so complex it is difficult to identify at the margin what change in input has generated the trading signal. More complex models include other inputs, such as data on market positioning, data from options markets and, increasingly, transaction flow data. The investment horizon of model-driven funds is often very short, at

<sup>11</sup> The number of funds reporting to TASS Research, which produces data on hedge funds, increased from 2,270 in the fourth quarter of 2000 to 2,722 in the fourth quarter of 2001.

#### Box 4

##### CTAs

A Commodity Trading Adviser (CTA) is an individual or company which, for a commission or a share in profits, advises others as to the value or advisability of buying or selling futures or options contracts. In many cases CTAs act as fund managers too, often on behalf of a large number of clients, in contrast to the traditional hedge fund. They also invest in each other, thus diversifying risk and management styles. Most are registered with the Commodity Futures Trading Commission. The government regulator is the National Futures Association. Traditionally their activities have centred on bond and equity markets. More recently they have become active in currencies. They trade primarily on futures exchanges.

most a week or two and sometimes intraday. One implication of this is that, while the currency risk being run by these funds at any point in time may be small compared with that of the macro funds of a few years ago, the FX market turnover they generate may be relatively large.

Market participants have suggested that the increased popularity of model-based trading, which is a feature not just of leveraged funds, but also of some institutional funds and of banks' own position-taking, is having an impact on market dynamics. A move through a key price level can generate a trading signal on a large number of models simultaneously, which may at times add short-term volatility to the market. Some market participants expressed concern that model-based trading in the less-traded currencies could potentially lead to episodes of sharp exchange rate movements and loss of liquidity in the future.

In recent months there appears to have been some signs of a revival in FX activity by global macro hedge funds. One interviewed hedge fund manager confirmed that after several years in which returns have been sought primarily in equity markets, it seems that more emphasis is again being given to FX markets. Research recently published in the trade publication EuroHedge is consistent with this picture: it found that assets managed by European hedge funds increased by 39% to USD 64 billion in the year to January 2002, with macro funds showing the fastest growth. Similarly, the TASS Research hedge fund

database shows a growing proportion (9.2%) of total hedge fund assets being devoted to global macro strategies during 2001, after a fall in late 2000.

Trade execution is very important to model-based funds. The value added by the execution in the market of a trade is often measured by taking the price level at which a model generates a trade signal as a benchmark which the dealer tries to improve on in the market. Traditional macro hedge funds are less likely to operate in this manner, possibly because their investment horizons are longer, and they tend to consider the "tactical" issue of the best moment to enter the market in combination with the "strategic" trade objective. They do, however, place a great deal of emphasis on being able to deal in large volumes discreetly and at short notice, moving the market as little as possible.

Leveraged funds have not, on the whole, embraced the new electronic dealing systems. This reflects in part the fact that they are significant players in the market that value personal contact with bank market makers and advice on execution. Some hedge funds are reportedly concerned that the liquidity available in electronic dealing systems is not yet sufficient for the volumes in which they trade. Lack of dealing privacy is also a factor. An increasing number of leveraged funds, particularly in the United States but also to some extent in Europe, have recourse to "prime brokerage" facilities (see Box 5).

## Box 5

### Prime brokerage

This is an arrangement whereby a fund's FX deals are executed through a single counterparty (the "hub" bank) with third-party banks ("spoke" banks) in the name of that counterparty. Subject to credit limits, the hub bank, which is usually a large, highly rated "money centre" institution, allows the fund to initiate trades in the hub bank's name with a group of pre-selected spoke banks. The fund's position with the hub bank may then be rolled forward by means of daily FX swaps until the fund reverses its original trade; or it may be settled at regular intervals, such as at the end of the month. It will generally be subject to collateralisation.

The leveraged fund community makes extensive use of prime brokerage accounts, but there are a few examples of other institutions such as corporates and small banks doing so too. At present, prime brokerage

accounts are far more common in the United States than in Europe, but some market participants expect the practice to grow in Europe if the number of leveraged funds based there continues to increase. Currenex is attempting to transfer this business model to its internet platform in a facility called Enhanced Market Access.

For the fund, the attraction of the prime brokerage model lies in the efficiency gains that it yields in terms of confirmation and settlement, since the fund only needs to have contact with one other back office, and from an efficient use of collateral. Rather than having to post collateral against balances with a number of different counterparty banks, collateral only has to be placed with the hub bank, allowing the fund to take advantage of offsetting balances. There is not necessarily any privacy advantage for the fund under the prime brokerage model. Indeed, the opposite is potentially the case because every FX transaction has to be disclosed to both the hub bank and the spoke bank rather than to just a single counterparty. Prime brokerage mandates may specify that the hub bank's back office must not disclose the fund's deals to the hub bank's front office; and some funds operate more than one prime brokerage account to avoid their entire business being visible to a single hub bank. The attraction for the hub bank is that the business provides a stream of fee income in return for the use of its balance sheet and credit assessment facilities, which it may view largely as fixed costs. The spoke banks may also welcome the prime brokerage arrangement because it enables them in effect to accept the fund's business without having to expose themselves to the associated credit risk.

#### **4.3.2 Institutional funds and institutional asset managers**

Institutional funds, often referred to in the market as “real money” funds, have tended to take a more proactive approach to the management of FX positions in recent years by separately identifying and managing currency exposures, a process known as currency overlay. This partly reflects a trend towards greater diversification of underlying asset positions across international markets (some market participants have suggested that the introduction of the euro has led some fund managers to further diversify asset holdings outside the euro area). It also reflects a greater recognition of the impact of currency exposures on base currency returns insofar as funds are required to report performance more frequently and in greater detail, and a more widespread acceptance of the intellectual case for managing currency risk. This is essentially because unmanaged currency exposure has a zero expected return in the long term but adds volatility to reported returns in the meantime. Currency overlay managers also argue that foreign exchange is in effect an asset class, which, if actively managed, can help reduce risk through diversification benefits and yield positive returns. Lower

returns in equity markets over the past two years are said to have encouraged equity fund managers to focus more on currency returns, which they might previously have considered too small to be of interest.

However, many cross-border funds do not seek to manage currency risk. In some cases this may be due to the nature of the fund – for example, investors in a retail fund advertised as holding foreign equities might be considered to expect and even desire the currency risk on the asset position rather than have it hedged away. Higher hedge ratios are also associated with a higher volume of transactions, which some funds find undesirable. A decision to effectively disregard currency exposure may be due to “regret risk”: i.e. even if the intellectual case for hedging currency risk is accepted, the decision to start doing so entails the risk that, in retrospect, it would have been better to maintain an unhedged position. In some countries regulation may also be a constraint (see sub-section 4.3.4).

One approach to managing currency risk for an institutional fund is, first, to establish its strategic approach to currency risk in the form of a “hedge ratio” representing the proportion of foreign currency exposure (i.e.

foreign assets held) to be hedged. This hedge ratio may be derived by a mean-variance analysis that calculates, on the basis of certain assumptions and given the fund manager's risk tolerance, an "optimum" level of currency exposure, taking advantage of the diversification benefits offered by currency risk. Alternatively, the hedge ratio may be determined in a less complicated way: e.g. a common hedge ratio is 50%. Some funds choose to hedge 100% of their currency risk, although higher hedge ratios will generate more transactions, which some fund managers dislike.

Market participants have suggested that much of the increase in funds' FX turnover in recent years stems from the regular trades required to align the fund's foreign currency exposure to the chosen hedge ratio as exchange rates and underlying asset prices change. This rebalancing may take place monthly (most common), weekly or daily. One European asset management company said that its FX turnover had increased by 80% in 2001 alone, and that most of this increase was due to hedging activity. It is interesting to note that hedging often requires funds to buy currencies that have depreciated against the fund's base currency – since this depreciation will have reduced the base currency value of assets held in the depreciating currency. These regular rebalancing trades may be undertaken on either the spot or forward market. Alternatively, derivative structures may be employed.

Asset switch trades that move the underlying asset allocation of a fund away from the benchmark will potentially give rise to foreign currency exposures. Market participants suggested that such trades could potentially be done on either a hedged or an unhedged basis. This element of FX activity will therefore be driven to a large extent by the same factors that drive the relative performance of underlying asset markets across countries.

Institutional funds are more likely than leveraged funds to use electronic trading

systems. Electronic systems are said to be particularly helpful in calculating net FX transactions arising from a cross-currency asset switch that may involve a number of underlying bond or equity trades – this is known as a "break-out".

#### **4.3.3 Active currency overlay management**

Currency overlay may be performed by a separate team in the fund management company, which is common practice in the larger institutional funds, or by independent overlay providers (several large asset management groups offer such services). Currency overlay managers may also actively manage FX risk, taking FX positions away from the strategic currency exposure benchmark, described in the previous section, in search of additional return.

Use of active currency management is believed to have grown rapidly in recent years. The number of firms offering a currency overlay service has increased,<sup>12</sup> although some of the interviewed market participants felt that new business was now increasingly going to the larger, more established providers. The growth of active currency management is said to have been driven in part by empirical research from actuarial consultants, which has concluded that currency overlay has in practice generated positive returns.<sup>13</sup> In explaining these results, the proponents of active currency overlay often argue that the FX market is inefficient owing to, for example, the presence in the market of allegedly non-profit-maximising players, such as corporates, institutional funds themselves (through their hedging activities) and central banks. Furthermore, based on their own proprietary research findings, they argue that exchange rates are subject to predictable short-run

<sup>12</sup> One analyst suggested that the number of providers has increased from around 12 five years ago to nearer 40 today – Jessica James, *IPE Magazine (Investment & Pensions Europe)*, September 2001.

<sup>13</sup> In particular, *Capturing Alpha through Active Currency Overlay (May 2000)*, by Baldrige, Meath and Myers of Frank Russell.

trends that can be exploited. Of course, the contrary argument, that FX rate movements cannot be predicted, is also often heard.

Active currency overlay managers employ a variety of different model types. Indeed, they will often use a combination of different models where research suggests that the correlation between the returns of the different model types is low. One family of models uses the momentum or trend-following technical approach described above in connection with leveraged funds. Another family attempts to exploit the “forward premium puzzle” – the idea that high-yielding currencies tend not to depreciate as implied by the theory of uncovered interest parity. A third type of model is based on fundamental measures of fair or equilibrium value, such as purchasing power parity. Several institutional funds prefer to adopt currency positions on the basis of fundamentals because they perceive such models to be more transparent, and the positions they generate more justifiable, when presenting performance to trustees. However, a small number of institutional funds are said to behave more like hedge funds in their appetite for currency risk and in their willingness to adopt positions on the basis of technical models.

#### **4.3.4 Impact of regulation**

In some EU countries legal or regulatory requirements place constraints on the foreign currency business of funds. For example, in Germany the Third Financial Market Promotion Act prohibits German investment trusts from carrying out currency transactions that are separate from an underlying investment instrument. In some other countries funds are not permitted to hold leveraged positions or unmatched short positions. In Sweden, new legislation governing investment rules for the Swedish National Pension Funds (AP Funds) came into effect in January 2001. These rules permit greater international diversification of the funds’ assets, and are believed to have contributed significantly to a rise in the FX activity of Swedish funds. In France, funds are not allowed to hold short FX positions.

#### **4.3.5 Impact of fund benchmarks**

Market participants reported in interviews that the FX business of institutional funds is increasingly benchmarked against published reference rates (“fixes”). This reflects demands from fund trustees and other sources for greater transparency and consistency in valuation methodologies, partly to facilitate comparisons of performance. The most popular reference rates are those

### **Box 6**

#### **WM fixes**

WM Company, which is owned by Deutsche Bank, provides reporting, analysis, research, consulting and administration services to the fund management industry. Since 1994 WM Company has published daily standardised closing spot exchange rates using information provided by Reuters. Currently 103 currencies are quoted, with bid, ask and mid rates available. Since 1997 forward rates have also been published, and nine maturities for 41 currencies are available. Since June 2001 intraday spot rates have been published.

The closing spot rates are based on rates at 4 p.m. (UK time) each trading day and are published at around 4.15 p.m. The published rates are based on traded rates seen on Reuters dealing system, along with other quoted rates contributed to Reuters by market participants. WM Company fixes and publishes its rates after applying a methodology designed to remove any rate that is not representative of the market.

EBS has disclosed a plan to develop reference rates based on the actual dealing taking place on its electronic platform.

## Box 7

### ECB reference rates

ECB FX reference rates are agreed upon during a daily teleconference between 21 central banks inside and outside the ESCB which normally takes place at 2.15 p.m. (C.E.T.). On average the publication takes place at around 2.30 p.m. (C.E.T.). Since the published exchange rates of the 28 currencies against the euro are averages of bid and ask rates, they are not necessarily rates at which actual market transactions have occurred. ECB FX reference rates are published for reference purposes only.

published by WM Company (see Box 6). The reference rates published by the ECB (see Box 7) and the Bank of England are also said to be employed as fixes to some extent, but the relatively narrow range of exchange rates covered renders them less useful for this purpose. Some market participants felt that these reference rates are so important that they would like to see an independent source of good quality reference rates. Others saw no problem with the current provision.

Anecdotal evidence suggests that an increasing volume of FX business is being transacted around the times of the WM

Company's closing fixes, particularly at quarter-ends and, to a lesser extent, at other month-ends. This is discussed further in Section 5.2 on market liquidity. Funds' underlying asset positions are often benchmarked against global benchmark indices. Changes in these indices can give rise to large FX flows. The most recent example was the first stage of the adjustment of the Morgan Stanley Capital International (MSCI) global equity index at the end of November 2001. The MSCI index is being adjusted so that market weights are based on the "free float" value of issued equity, rather than total market capitalisation.

## 5 Structural issues – the changing nature of the FX market

### 5.1 Changes brought about by electronic broking and e-commerce

With an average daily turnover of USD 1,200 billion, the FX market is by far the largest and most liquid market in the world. To be able to deal with the large amount of flows in this market, efficiency is a key element. In the search for efficiency, electronic trading has become an important factor in FX trading.

The basic nature of FX trading has not been altered by the introduction of electronic trading, but electronic trading does differ to a certain extent from traditional FX trading. First, electronic trading systems make it possible for many market participants to interact at the same time on a single platform without being at the same location. Before the introduction of these systems, communication in the FX market was mainly established bilaterally by telephone. Second,

economies of scale can be exploited through electronic trading. By enhancing the capacity of electronic trading systems, the boundaries within which the system is operational can be broadened in a relatively simple manner. By contrast, in physical market places expansion is rather difficult to achieve if the capacity of the physical location is already fully employed. Third, electronic trading can enhance the cost efficiency of trading and processing. An important element of electronic trading is the scope for STP. With STP, a transaction is processed automatically through the different stages of the transaction process without any further manual intervention. Overall costs and the number of human errors can therefore be reduced substantially.

Various electronic trading systems are operational in the FX market. There are two basic types of system: those connecting dealers among themselves and those

connecting dealers to customers. The interbank market is dominated by two electronic trading systems – EBS and the Reuters dealing system. A large proportion of trades in the main currency pairs involving the euro is transacted through EBS, while currency pairs involving the pound sterling tend to be transacted more through Reuters. These virtual market places are the main contributors of market turnover. According to banks, about 85% to 90% of all interbank spot transactions are transacted through either EBS or Reuters. According to a report by Sveriges Riksbank in 2001, in times of stress this percentage falls to 70% of all FX transactions. An observation can be made about the typical size of transaction on these systems. In general, the transaction size has decreased over the last few years. A standardisation effect appears, as the size on these systems is relatively small. Larger deals are quite often done directly with one or a few counterparties. This effect also applies to the instruments that are traded on the systems. Straight forward spot deals in particular (and to a lesser extent FX swaps) are transacted through the electronic trading systems, more so than non-standardised OTC products at the other end of the spectrum.

The second type of electronic trading system allows the banking industry to offer online trading facilities to their clients (see Box 2). The turnover of the online systems in the FX market is still quite limited, with banks reporting ticket sizes of up to USD 20 million. Although the total value is difficult to estimate, the daily turnover of the above-mentioned main multi-dealer systems is believed to be about USD 1 billion to USD 2 billion. Expectations are that this market will grow substantially over the next few years.

A recent development in the electronic trading market is the introduction of pricing engines. The electronic FX market is, due to the various electronic trading systems operational in the market, still rather fragmented. Pricing engines could further centralise the market, as these engines link

the separate electronic trading systems and other price sources into one central pricing source for a given market maker. This development will further enhance the transparency of the price-making process in the FX market.

One effect of the increasing virtualisation of the FX market is the reduction of operations by voice brokers in the market. As the flow of bilateral telephone trades has diminished, so the role of voice brokers has also diminished. Anecdotal evidence suggests that banks nevertheless continue trading with voice brokers, as they value the existence of an alternative trading channel in times of stress.

The structure of costs in FX trading has changed as a result of the introduction of electronic trading. The costs of participating in multi-dealer electronic trading systems, for example, can be substantial. First, a fee has to be paid for participation and, second, a two-sided fee has to be paid for each transaction executed on the system. Until recently such transaction fees were unusual in the FX market, as the costs would normally be covered by the bid-ask spread. However, in the era of electronic trading bid-ask spreads are declining.

Moreover, users seem to be willing to pay for the STP facilities offered by the electronic trading systems. The progressive adoption of STP may make some middle and back-office staff redundant. Resources in FX trading may therefore be differently allocated in the changing environment, as electronic trading systems seem set to become attractive to an increasing number of FX market players.

## 5.2 Liquidity in the FX market

The variety of responses from interviewed market participants on the topic of the evolution of market liquidity over recent years indicates that perceptions of liquidity may differ. Some conclusions can, however, be drawn from the interviews, but before

presenting these findings it is worth reminding ourselves of one widely accepted definition of liquidity: a liquid market is one in which participants can rapidly execute large volume transactions with a minimal impact on prices. Furthermore, market liquidity is usually discussed in academic literature in terms of at least one of three possible characteristics: tightness, depth and resiliency. Tightness is how far transaction prices (bid or ask) diverge from the mid-price. Depth is either the volume of trading possible without affecting prevailing market prices, or the volume of orders on the order books of market-makers at a given time. Resiliency is either the speed with which price fluctuations resulting from trades are dissipated, or the speed with which imbalances in order flows are adjusted.

Most of the interviewees were of the opinion that there is good liquidity in the FX market, while a minority were of the opinion that liquidity has either deteriorated or improved since 1998. However, a distinction should be drawn between major currencies and minor (less traded) currencies. Generally, liquidity in major currencies is considered to be good, while it is considered to have deteriorated for smaller currencies. EUR/USD is viewed as by far the most liquid currency pair. However, liquidity conditions have changed. Most respondents took the view that liquidity was no longer continuous, but was instead discontinuous or fragmented and concentrated in European trading hours. More specifically, liquidity is concentrated in the morning hours when European and Asian markets overlap, and the afternoon hours when European and US markets overlap. Furthermore, observers point out that liquidity has been migrating to the times that the main FX reference rates are calculated, of which the most important is the WM Company's fixing at 4 p.m. (UK time) and, to a lesser extent, the ECB reference rate fixing at 2.15 p.m. (C.E.T.). Market prices and, to a lesser extent, liquidity can also migrate towards the strike prices and expiry times of large option deals at 3 p.m. (UK time). Occasionally, liquidity is seen as also being dependent on the technical sensitivity of the

level of the exchange rate. An example given by interviewees was breaches of certain technical levels which trigger transactions by, for example, model-based funds. In other words, the liquidity varies during the day, tailing off and picking up again. No substantial changes in bid-ask spreads for major currencies were reported, but the spreads were reported to be very tight.

In contrast to the spot market, liquidity in the options market was clearly seen as deteriorating, as the number of market makers/large players has diminished considerably. This is not only a result of the ongoing consolidation in the banking industry, but also because of a decline on the demand side. One reason for this is described in subsection 4.2.2, i.e. a less dynamic approach to FX risk management by corporates.

The reasons for these changes in liquidity are the same ones that underlie the decline in turnover, such as the increase in electronic trading and the virtual disappearance of direct dealing, the diminishing importance of traditional market-making and a reduction in the number of market makers, and general consolidation in the banking sector. This consolidation has been accompanied by a decline in appetite for risk in some banks. The disappearance of large hedge funds, which tended to be providers of liquidity because they act as contrarians, was also mentioned as a factor. The reason why liquidity appears to migrate towards fixings seems to be the increasing amount of "benchmark-critical" fund business, coupled with interest from other market participants. As more fund business is transacted at these fixed times, other market participants tend to enter the market at the same time, perhaps to trade discreetly or to just take advantage of the liquidity. One reason for declining liquidity in peripheral currencies seems to be that market participants often tend to have similar interests (whether buyers or sellers). The market may, for example, be dominated by financial institutions tracking the same indices. The means of trading is also seen as affecting liquidity to some extent, i.e. whether market

participants trade by placing an order or by asking for simultaneous quotations of two-way prices. Generally, market participants reported an increasing tendency to work simply by placing orders, which should smooth out the flow of transactions and related price changes. It should be stressed, however, that the market does not seem to be concerned about liquidity conditions, although small gaps in liquidity (a sudden large movement in price is often interpreted as a sign of reduced market liquidity) seem to be occurring somewhat more frequently.<sup>14</sup>

In a recent study, Detken and Hartmann (2002)<sup>15</sup> showed that the euro's current trading volume and liquidity is very close to that previously observed for the Deutsche Mark. They reported an increase in transaction costs (relative bid-ask spread in pips) for EUR/USD but not for any other currency pair. However, this can be explained by the lower limit for absolute bid-ask spreads (1 pip) imposed by quoting conventions, the inversion of the EUR/USD exchange rate (i.e. the quoting convention of EUR 1 per USD rather than USD 1 per DEM) and the appreciation of the US dollar after the introduction of the euro. The information received directly from market participants for this study supports the finding that the liquidity of the euro is close to the former liquidity of the Deutsche Mark.

In general, liquidity was neither an issue nor a concern among interviewed market participants. Despite lower turnover in the spot market, liquidity seems to be good, thanks to the sufficient number of market participants and the absorptive capacity of the market (large deals do not significantly affect prices). A change in the liquidity pattern has occurred, however, as some discontinuity in liquidity availability has been observed on occasions.

### 5.3 Towards a more concentrated structure in the FX market?

Since 1998 the process of concentration in the banking sector has continued.<sup>16</sup> The market share of a handful of big banks has increased and the number of companies engaged in FX dealing has fallen sharply. This consolidation can be attributed to bank mergers and acquisitions and to the attempts of individual banks to concentrate all their trading activities in one book. In addition, banks have recently been trying to outsource settlement operations and thus to pool them with those of other banks. According to most experts, the trend towards increased concentration is likely to continue in the future owing to the following factors: heated competition which has been intensified by growing transparency, and a sharp increase in costs related to the development and operation of new systems in connection with the need to participate in the global market place.

It is argued by some that if CLS becomes the market standard, as is widely expected, this may also encourage further concentration in the area of FX trading, because only a small number of banks will be able to provide complete settlement services across borders, although third-party access may reduce such pressures (see sub-section 5.4).

Although the growing trend towards fewer players in the banking sector is not seen as a threat to market liquidity and efficiency, some market participants still think that further concentration may entail an increased risk of sudden "liquidity gaps".

<sup>14</sup> Chaboud and Weinberg (2002, BIS papers No. 12) found no evidence of a substantial change over time in the level of volatility or in the frequency of large movements in FX markets.

<sup>15</sup> Detken and Hartmann, "Features of the euro's role in international financial markets", *Economic Policy*, October 2002.

<sup>16</sup> The latest Euromoney foreign exchange poll (May 2002) showed that 44.5% of overall market share was concentrated in the hands of the top five players, compared to 35.8% in the previous year. The top ten banks accounted for an aggregate market share of 61.6%.

## **5.4 CLS – a potential engine for change in the structure and functioning of the FX market**

### **5.4.1 Background and principles of CLS**

Currently the two sides of an FX deal are settled independently from each other, either through correspondent networks or in large-value payment systems. In both cases the fact that the two sides are not settled simultaneously, owing to time zone differences and for organisational and operational reasons, gives rise to FX settlement risk.

CLS is a system designed to settle FX transactions between member banks on a payment-versus-payment (PVP) basis in the books of CLS Bank. The PVP mechanism ensures that the final transfer of one currency occurs if, and only if, the final transfer of the other currency takes place. Initially seven currencies (USD, EUR, JPY, GBP, CHF, AUD and CAD) were eligible for settlement. CLS Bank started operations on 9 September 2002. The current 65 shareholders are the major players in the global FX market and operate as Settlement Members in CLS.

CLS eliminates settlement risk for transactions settled in the system and substantially reduces the liquidity needed to settle a given volume of FX trades compared with traditional FX settlement practices, since Settlement Members will have only one position per currency in the system. However, its operations have created new challenges for banks' liquidity management. Settlement in CLS Bank occurs within a very narrow time window, which corresponds to the only period when the payment systems of all relevant currencies are open.

Accordingly, Settlement Members have to fund their debit positions on CLS Bank's accounts with the central banks according to a specific pay-in schedule, in some cases at times when the relevant markets are not yet open (e.g. North America) or are approaching close of business (e.g. Australia, Japan). To

facilitate their liquidity management, banks have developed a tool to reduce the size of their pay-ins. This tool, called an "in/out swap", allows banks to swap their positions from inside CLS to the outside market, thus reducing the time-criticality of the payments. However, this does re-introduce a settlement risk for the value of the in/out swap. Central banks expect that in/out swaps will only be a temporary phenomenon and will gradually be phased out.

### **5.4.2 Potential consequences of CLS**

CLS will eliminate FX settlement risk but it requires the making of timed payments that may sometimes be of substantial value, thus increasing the challenges for intraday liquidity management. Since, as a result, liquidity will obtain value at particular times during the day, some market participants expect the emergence of an intraday money market. However, other banks take the view that high transaction costs will render the calculation of intraday interest unprofitable and that it is therefore unlikely that an intraday market will develop.

Most banks expressed the view that CLS could become the dominant system for the settlement of FX transactions in the CLS-eligible currencies. Others were more sceptical, arguing that CLS would impose high operational challenges.

Most banks expect CLS to contribute to an acceleration of the process of concentration in the banking industry, in particular as far as FX settlement procedures are concerned. Owing to the high costs, liquidity requirements and operational requirements, smaller banks are unlikely to become Settlement Members, but will instead make use of correspondent banking services (third-party business) offered by other Settlement Members.

Some banks have indicated that they could imagine a widening of the spreads for FX transactions that are not settled via CLS.

Since such transactions would, unlike transactions settled via CLS, still be subject to FX settlement risk, and since CLS might become the future market standard for FX settlement, the higher risk and non-standard settlement should be priced by wider spreads. Other market participants were, however, sceptical as to whether competition in FX

business would allow for a widening of such spreads.

In conclusion, judging from the different views expressed by interviewed banks, it would be premature to give precise forecasts for the impact of CLS on financial markets at this stage.

## 6 Concluding remarks

The FX market has undergone dramatic changes over the past ten years. The interbank market has gradually moved from direct dealing and voice broking to trading via electronic deal matching systems, from a relatively fragmented market structure to a more concentrated one, and from a wide array of tradable currencies to a more “polarised” international monetary system with the launch of the euro.

Many market participants expect the identified general trends to continue and possibly intensify. If the process of consolidation in the banking industry were to continue, giving rise to more mergers, especially in Europe where cross-border deals have been scarce so far, a more concentrated FX market on the sell side (the market makers) would result. Similarly the polarisation process could intensify over the medium to long term with the prospect of the entry into EMU of the EU accession countries and of some other EU Member

States. Possible changes could also emerge from two areas where electronic broking has been less successful so far – less standardised FX market segments like swaps and options and internet-based bank-to-customer platforms. Consequences could also result from the launch of CLS.

The ongoing changes are the signs that the FX market is able to respond to a general demand for ever-greater efficiency. For instance, internet-based systems are aimed at reducing operating costs and increasing transparency, and the objective of CLS is to eliminate settlement risk. However, some market participants also see potential risks, such as an overconcentrated market, possible adverse effects on liquidity and exposure to the operational risks of a few key technical systems. Market participants and central banks will be watching structural developments in the FX market very closely for signs of any imbalance between increased efficiency and heightened risk.

## Annex I: Tables on FX market turnover

**Table 1**

### Currency distribution of reported FX market turnover

(percentage shares of average daily turnover in April, total = 200%)

	1992	1995	1998	2001
US dollar	82.0	83.3	87.3	90.4
Euro	–	–	–	37.6
Deutsche Mark	39.6	36.1	30.1	–
EMS currencies and ECU	55.2	59.7	52.5	–
Japanese yen	23.4	24.1	20.2	22.7
Pound sterling	13.6	9.4	11.0	13.2
Swiss franc	8.4	7.3	7.1	6.1
Swedish krona	1.3	0.6	0.4	2.6

Source: BIS.

**Table 2**

### Reported FX market turnover by selected currency pairs

(percentage shares of average daily turnover in April, total = 100%)

	1992	1995	1998	2001
EUR/USD	–	–	–	30
USD/DEM	25	22	20	–
USD/other EMS currencies and ECU	10	15	17	–
EUR/JPY	–	–	–	3
DEM/JPY	2	2	2	–
USD/JPY	20	21	18	20
EUR/GBP	–	–	–	2
GBP/DEM	3	2	2	–
GBP/USD	10	7	8	11

Source: BIS.

**Table 3****Currency composition of FX trading volume before EMU and in 2001***(USD billions and percentages)*

		USD volume (and as a %)	DEM volume (and as a %)	Eliminated euro area volume (and as a %)	Euro volume (%)
Spot	1992	284 (72)	210 (53)	36 (9)	202 (56)
	1995	351 (71)	268 (54)	67 (14)	236 (55)
	1998	455 (79)	247 (43)	38 (7)	252 (47)
	2001	327 (84)	–	–	166 (43)
Forward	1992	44 (76)	21 (36)	2 (4)	26 (47)
	1995	77 (80)	30 (31)	6 (6)	42 (46)
	1998	106 (81)	36 (28)	6 (4)	55 (44)
	2001	111 (85)	–	–	54 (42)
Swap	1992	309 (95)	73 (22)	4 (1)	120 (37)
	1995	518 (95)	112 (21)	12 (2)	232 (43)
	1998	699 (95)	147 (20)	11 (2)	337 (47)
	2001	623 (95)	–	–	221 (34)
Total	1992	637 (82)	303 (39)	42 (5)	348 (47)
	1995	947 (83)	411 (36)	85 (7)	510 (49)
	1998	1,260 (87)	430 (30)	55 (4)	643 (46)
	2001	1,060 (90)	–	–	442 (38)

Sources: BIS, Detken and Hartmann, "Features of the euro's role in international financial markets", *Economic Policy*, October 2002.

Notes: The totals would amount to 200% if all currencies were shown. The eliminated euro area volume is the volume net of interbank and cross-border double counting. The percentage shares for euro are not comparable to shares for other currencies prior to 2001 because in the euro share calculations (in the denominator) the eliminated euro area volume was subtracted from the global volume.

**Table 4****Geographical distribution of reported FX market turnover***(USD billions and percentages)*

	1992	1995	1998	2001
All euro area countries	184 (17.1)	276 (17.6)	339 (17.2)	239 (14.8)
Germany	55 (5.1)	76 (4.8)	94 (4.8)	88 (5.4)
France	33 (3.1)	58 (3.7)	72 (3.7)	48 (3.0)
Sweden	21 (2.0)	20 (1.3)	15 (0.8)	24 (1.5)
Denmark	27 (2.5)	31 (2.0)	27 (1.4)	23 (1.4)
United Kingdom	291 (27.0)	464 (29.5)	637 (32.5)	504 (31.1)
Switzerland	66 (6.1)	87 (5.5)	82 (4.2)	71 (4.4)
United States	167 (15.5)	244 (15.5)	351 (17.9)	254 (15.7)
Japan	120 (11.2)	161 (10.2)	136 (6.9)	147 (9.1)

Source: BIS.

**Annex 2: Co-ordination of the study**

The study of the Market Operations Committee (MOC) of the ESCB was conducted by a working group involving representatives from the ECB and from NCBs which was chaired by Mr. Bruno Estecahandy of the Banque de France. The other members of the working group were: Volker Hartman

(Deutsche Bundesbank), Bernd Strüber (Deutsche Bundesbank), Jouni Timonen (ECB), Cyrille Stevant (Banque de France), Martin Heerma (De Nederlandsche Bank), Graham Young (Bank of England), Thomas Ernhagen (Sveriges Riksbank) and Magnus Vesterlund (Sveriges Riksbank).