



EUROPEAN CENTRAL BANK



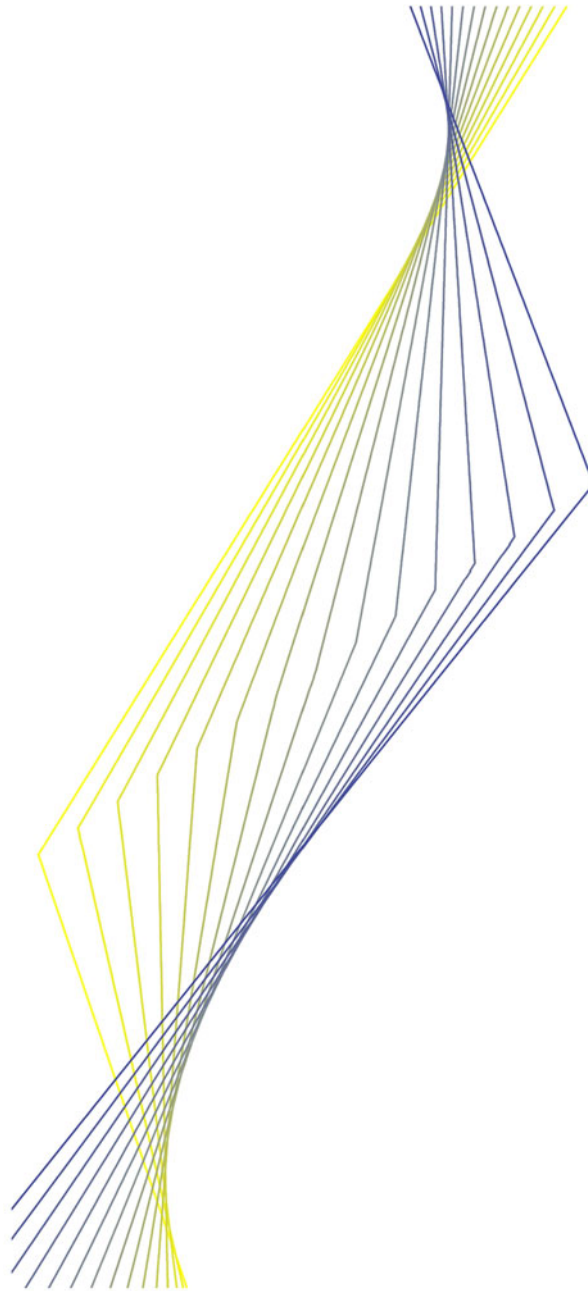
EURO MONEY MARKET STUDY 2001 (MOC)

December 2002





EUROPEAN CENTRAL BANK



**EURO MONEY MARKET
STUDY 2001 (MOC)**

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ISBN 92-9181-336-2

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I. Executive summary

This is the third report on the structure and functioning of the euro money market, based on data collected from banks in a survey conducted by the European Central Bank (ECB) and the national central banks (NCBs) of the European System of Central Banks (ESCB). Overall growth in money market activity continued in 2001, although at a lower rate than in previous years. The report highlights the following main trends in the different segments of the euro money market.

In the unsecured market, the report confirms that activity is concentrated in the O/N segment. In the secured market, growth in turnover persisted in 2001. In the OTC derivatives market, which includes interest rate swaps (OIS and others) and the foreign exchange swap market (foreign exchange swaps and cross-currency swaps), the most rapid growth was reported in interest rate swaps and cross-currency swaps. No increase was reported in foreign exchange swap turnover. Finally, activity in the euro interest rate futures, options and short-term securities markets significantly increased.

The report also highlights structural developments in the euro money market, looking first at the importance of the EONIA swap market. The OIS market segment involves a wide range of market participants, not only banks, as this instrument is used for both position-taking and for managing short-term interest rate risk. The use of EONIA swaps in connection with the refinancing operations of the Eurosystem may also have contributed to its expansion. The report goes on to look at the functioning of triparty repos. Finally, the continued development of electronic trading platforms and growth in electronic transactions is addressed.

In general, market participants reported that they were satisfied with the degree of efficiency and integration, especially in the unsecured deposit and derivatives markets. While the short-term securities market is still characterised by a lower degree of development and integration, an initiative is being undertaken by an ACI task force, which has so far resulted in nine suggested recommendations. Finally, this report also touches on the remaining sources of fragmentation, as contained in the Giovannini report published in November 2001.

2. Introduction

In the fourth quarter of 2001, the European Central Bank (ECB) and the national central banks (NCBs) of the European System of Central Banks (ESCB) conducted, under the auspices of the Market Operations Committee of the ESCB, a survey among banks regarding the euro area money market. The results of the latter survey form the basis for this report's analysis of the euro area money market, which in turn follows up on similar studies conducted in 1999 and 2000 (see ECB: "The impact of the euro on money and bond markets", July 2000, and ECB: "The euro money market", July 2001).

This report aims at assessing trends and developments in the integration and efficiency of the euro money market. It is mainly based upon information derived from the quantitative and qualitative survey conducted in 13 countries, collecting data from the second quarter of 2001 and the second quarter of 2000. Each NCB selected a number of banks with a view to obtaining a representative coverage of money market activities. Altogether, a total of 113 banks participated, of which 4 were located in Belgium, 15 in Germany, 8 in Greece, 13 in Spain, 7 in France, 9 in Ireland, 12 in Italy, 6 in Luxembourg, 5 in the Netherlands, 4 in Austria, 14 in Portugal, 4 in Finland and 12 in the United Kingdom. The methodological remarks contained in the questionnaire are enclosed in annex I of the report.

In addition to incorporating the results of this survey, the section on the futures and options markets (section 3.5) relies on data published by the London International Financial Futures and Options Exchange (LIFFE), while the section on the short-term securities market (section 3.6) also draws on data from the ECB's securities database and the Banque de France's database.

It has to be stressed that the quantitative data was not obtained from the standard reporting systems of credit institutions. It does not, therefore, provide an indication of the volume of transactions in the euro area money market which would fulfil all statistical standards. Instead, its purpose is to highlight the main trends observed that affect the market's structure. As a consequence, the report neither assesses the overall size of the different segments of the euro money market, nor does it compare the euro area money market with that of other major markets, like the United States or Japan. It should also be noted that comparative data are not exhaustive: not all banks are active in each segment of the money market, or were able to deliver data for both the second quarter of 2001 and that of 2000. The underlying panels therefore differ in the analysis of the different market segments, so that an unconditional comparison is neither possible for these segments, nor for the findings of the last surveys. The aim is, however, to keep the questionnaire from now on as much stable as possible, so that in the coming years comparisons will become increasingly valid.

3. Main trends in the different market segments

3.1 The euro money market in 2001: expectations of decreasing interest rates

The findings of the study naturally have to be assessed against the background of the overall money market conditions in the survey period. In 2001, the money market was marked by pronounced expectations of decreasing interest rates, implying a negatively sloped yield curve. The ECB lowered the minimum bid rate of the main refinancing operations (MROs) by a total of 150 basis points in four steps over the course of the year. By mid-November 2001, this downward movement in rates came to a halt and the longer maturity rates increased, driven by market expectations of an economic recovery.

Expectations of interest rate cuts manifested themselves in four cases of underbidding in the Eurosystem's MROs, i.e. counterparties did not submit sufficient bids that would allow for an allotment in line with a smooth path of the fulfilment of reserve requirements. These bidder restraints, coupled with the terrorist attacks of 11 September 2001 (see annex 4), were accompanied by distortions in money market interest rates. Apart from these incidents, the volatility of the overnight interest rate was however generally low, with EONIA usually following the pattern of the marginal interest rate of the MROs.

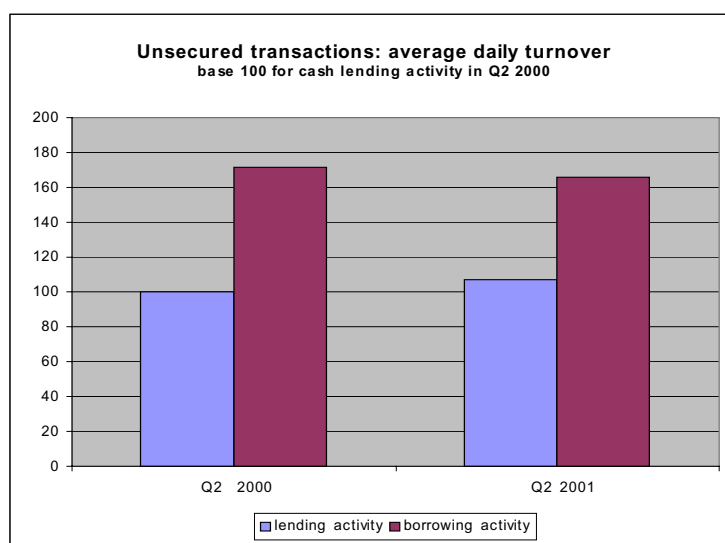
3.2 Developments in the unsecured market

3.2.1 Turnover analysis

The turnover data for unsecured business does not indicate a clear trend. Survey participants report that while cash lending activities increased by 7 % between the second quarter of 2000 and the second quarter of 2001, cash borrowing activities decreased by 4 %. Although in the interbank market, on the whole, cash lending must equal borrowing, it is notable that within the sample, cash borrowing activities exceeded cash lending activities by 54 % in the second quarter of 2001, and by 72 % in the second quarter of 2000, apparently caused by the specific business structure of many of the reporting banks. Many of these are faced with shrinking deposits, whereas the asset side of their balance sheet has generally inflated owing to their growing investment banking activities.¹ Consequently, these banks are cash-short and try to refinance via interbank deposits.

Chart I

Unsecured cash borrowing and cash lending activities for 2000 and 2001 (base: Q2 2000=100)



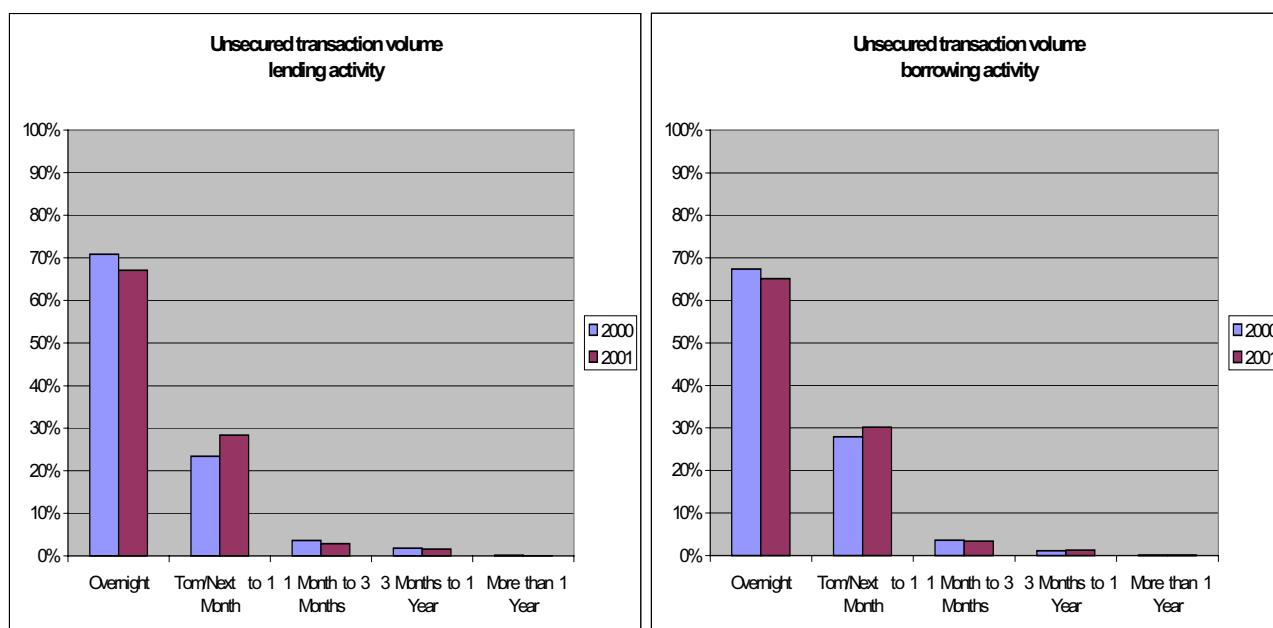
¹ The figures obviously depend on the sample covered in the survey, and normally structural and cyclical developments have to be differentiated. However, the necessary tools are not available in this exercise.

3.2.2 Maturity analysis

The turnover breakdown by maturity broadly confirms the trend already observed in the 2000 study. The bulk of unsecured business is in the O/N segment, which accounted for 67 % of lending and 65 % of borrowing activities in the second quarter of 2001. The T/N to one month segment is also important, with a share in the second quarter of 2001 of 28 % for lending and 30 % for borrowing activities. Lower volumes of business occur at maturities greater than one month; in the second quarter of 2001 only 5 % of lending and borrowing transactions were for maturities longer than one month. Moreover, the share of O/N transactions decreased slightly, from 71 % to 67 % in terms of lending, and from 67 % to 65 % for borrowing activities. Transactions of T/N up to one month increased somewhat, with lending activities up from 23 % to 28 %, and borrowing activities increasing from 28 % to 30 %.

Chart 2

Breakdown by maturity for 2000 and 2001, for unsecured lending and borrowing activities



The concentration of activity in the O/N segment, already described in last year's report, can largely be explained by the following factors:

- Because of balance sheet/cost considerations, banks tend to concentrate their short-term interest rate exposure at shorter maturities.
- Unsecured O/N business is very easy to handle from an operational point of view, as no problems with collateral settlement arise, and only limited back office support is needed. Securities settlement considerations act as a constraint on O/N repo activity.

As a matter of fact, demand for longer maturity is drying up. Available liquidity is invested in collateral, implying a lower risk exposure², lower charges on capital, and more flexibility as collateral can at any time be used as underlying for other transactions, for instance for central bank refinancing operations.

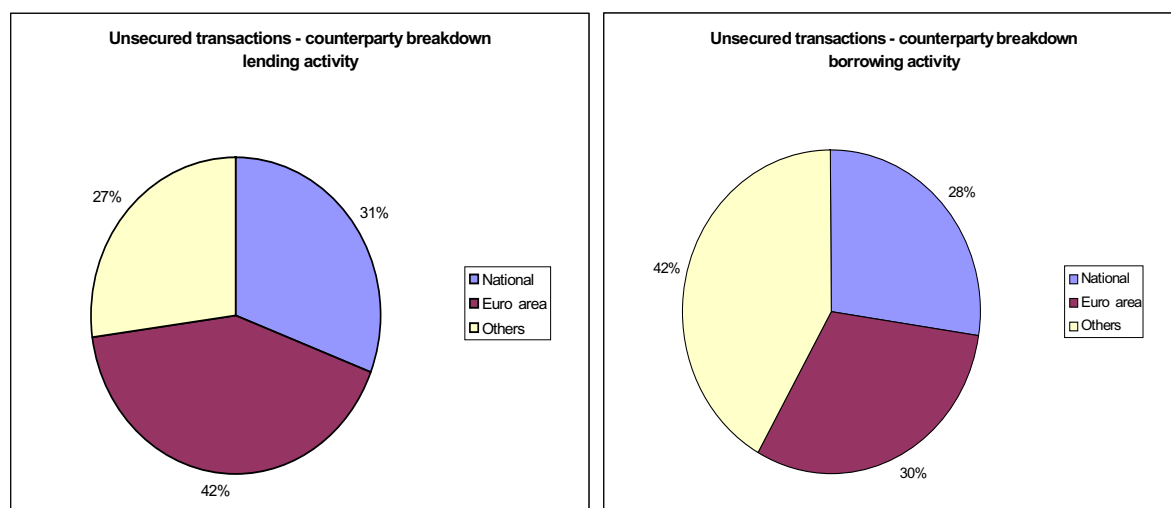
3.2.3 Market structure

According to the replies on the qualitative part of the questionnaire, the majority of market participants are clearly satisfied with the degree of efficiency in the unsecured market. Participants reported that overall liquidity levels are either unchanged or have improved over the past year.

Approximately 29 % of the euro deposits business is conducted with national counterparties, 35% with euro area counterparties and 36 % with counterparties outside the euro area. With respect to cash lending activities, 31 % of the counterparties are national, 42 % are from the euro area, and 27 % are from outside the euro area. The corresponding figures for cash borrowing activities are 28 %, 30 % and 42 %, respectively.

Chart 3

Geographical counterparty structure



As regards the trading structure, roughly 60 % of unsecured business is executed directly, 30 % via voice brokers, and 10 % via electronic devices. While direct bilateral trading remains the most popular practice, screen-trading is very widely used in Italy due to the wide acceptance of the e-MID system.

² In the O/N segment, credit risk is apparently perceived to be of limited relevance for this very short-term maturity.

The survey data reveal the following information as regards the extent of market activity concentration. In 2001, the share of the five largest players amounted to 32 % of unsecured lending and 20 % of unsecured borrowing turnover. The share of the ten largest players amounted to 45 % for unsecured lending and 37 % for unsecured borrowing business.

Table 1: Share of largest players

	Unsecured cash lending		Unsecured cash borrowing	
	2000	2001	2000	2001
5 largest players	21%	32%	22%	20%
10 largest players	31 %	45 %	30 %	37 %
20 largest players	55 %	64 %	58 %	58 %
Number of reporting institutions	97	108	95	107

3.3 Developments in the secured market

3.3.1 Turnover analysis

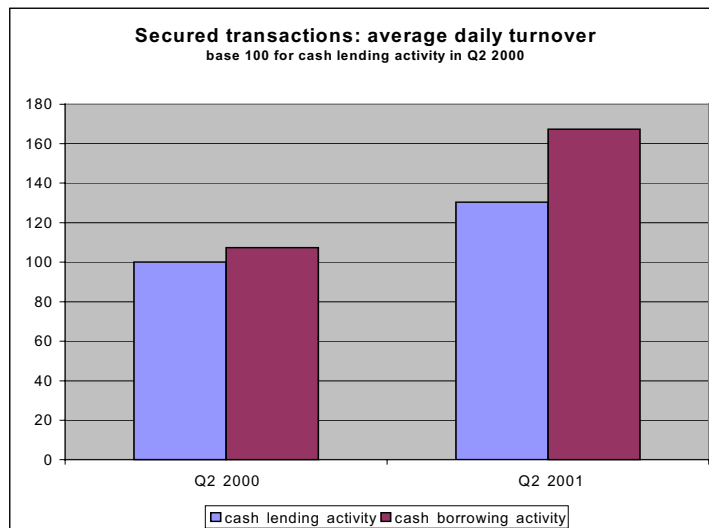
In the secured market, considerable turnover growth continued. Whereas reverse repo activities (i.e. cash lending against securities) grew by 30 % in the second quarter of 2001 compared with the second quarter of 2000, repo transactions (i.e. cash borrowing against securities) increased by as much as 56 %. The increasing need to limit credit risk exposures, together with constraints resulting from capital adequacy requirements, as already mentioned in last year's report, has fostered the repo business. Apparently, the merging of unsecured and secured funding desks has forced treasurers to consider capital costs when concluding transactions. Taking into account these opportunity costs, repo transactions are in many cases more favourable than unsecured business. Furthermore, smaller banks are active in this money market segment as well.³

Analogous to the unsecured segment, it is noticeable that borrowing activities exceed lending activities (whereas in actual fact, when referring to the interbank market as a whole, secured cash lending and cash borrowing must be equal). This development was very pronounced in the second quarter of 2001, with repo business surpassing reverse repos by 28 %, but less so in the second quarter of 2000 (dropping to only 7 %).

³ It should be noted that other new players, such as insurance companies, have also increased their activity in this market segment. However, banks were asked in the survey to report only interbank repos.

Chart 4

Secured cash borrowing and cash lending activities for 2000 and 2001 (base: Q2 2000=100)

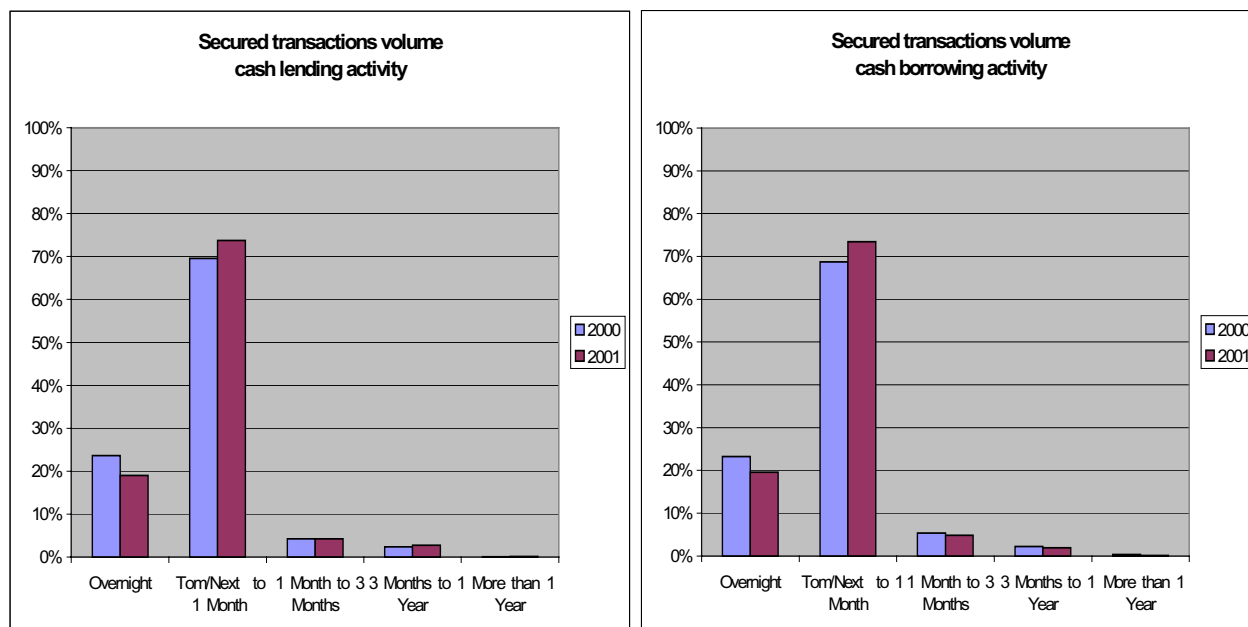


3.3.2 Maturity analysis

A breakdown by maturity shows that for both repo and reverse transactions, the turnover is concentrated on the short end of the yield curve. In the second quarter of 2001, O/N accounted for 19 % of the total reverse repo activity, operations T/N up to one month amounted to 74 %, and maturity above one month totalled 7 % of turnover. The maturity structure of repo activities is similar to reverse repos, with O/N at 20 %, T/N up to one month 73 %, and maturity above one month 7 %.

Chart 5

Breakdown by maturity for 2000 and 2001, secured lending and borrowing activities



As mentioned above, market participants preferred unsecured transactions in the O/N maturity, among other factors because of settlement considerations. The concentration of business in the T/N –up to 1 month segment could be due to pronounced expectations of decreasing interest rates in the second quarter of 2001.

Compared to the second quarter of 2000, the maturity structure was rather similar for both repo and reverse repos. Apart from that, as with the unsecured business, the share of O/N business declined slightly from 24 % to 19 % for cash lending, and from 23 % to 20 % for cash borrowing. The share of transactions of T/N up to one month rose from 70 % to 74 % for cash lending, and from 69 % to 73 % for cash borrowing.

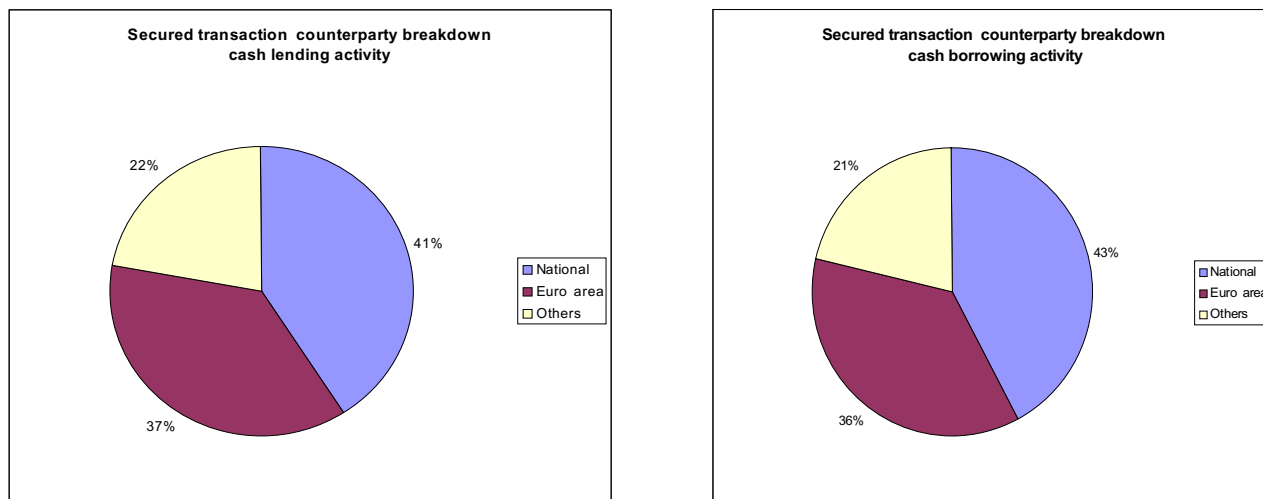
3.3.3 Market structure

The feedback from the qualitative part of the survey shows that the overwhelming majority of market participants deem the repo market to be sufficiently or significantly efficient. Furthermore, according to the views expressed, market liquidity either remains unchanged, or has even improved somewhat.

A geographical counterparty analysis of the repo business reveals that around 42 % of transactions are conducted with national counterparties, 38 % with ones in the euro area and 20 % with counterparties outside the euro area (mainly London-based banks). In the same vein, 41 % of cash lending secured turnover is transacted with national counterparties, 37 % with ones in the euro area and 22 % with counterparties outside the euro area. The corresponding figures for the secured borrowing business are nearly identical, amounting to 43 %, 36 % and 21% respectively.

Chart 6

Geographical counterparty structure



1 In terms of trading structure, approximately 51 % of repo transactions were executed directly, 36 % via
2 voice broker and 13 % via electronic systems. In spite of the emergence of several electronic platforms for
3 repo transactions (BrokerTec, MTS, EurexRepo), electronic trading still seems to account for the smallest
4 share. However, when looking at the market development over time, electronic trading could become
5 increasingly important (for example, BrokerTec Repo was only launched very recently, in December 2000)
6 (see also section 4.3).

7 If the secured business of credit institutions located in the UK is disregarded (which is necessary to
8 distinguish accurately between national and euro area collateral), the share of foreign collateral used as
9 underlying increased in the cash lending secured business. Comparison between 2001 and 2000 shows that
10 the share of national collateral decreased from 64.7 % to 54.2 %, whereas the shares of euro area collateral
11 and other collateral grew, from 24.6 % to 33.5 % and from 10.7 % to 12.3 %, respectively.

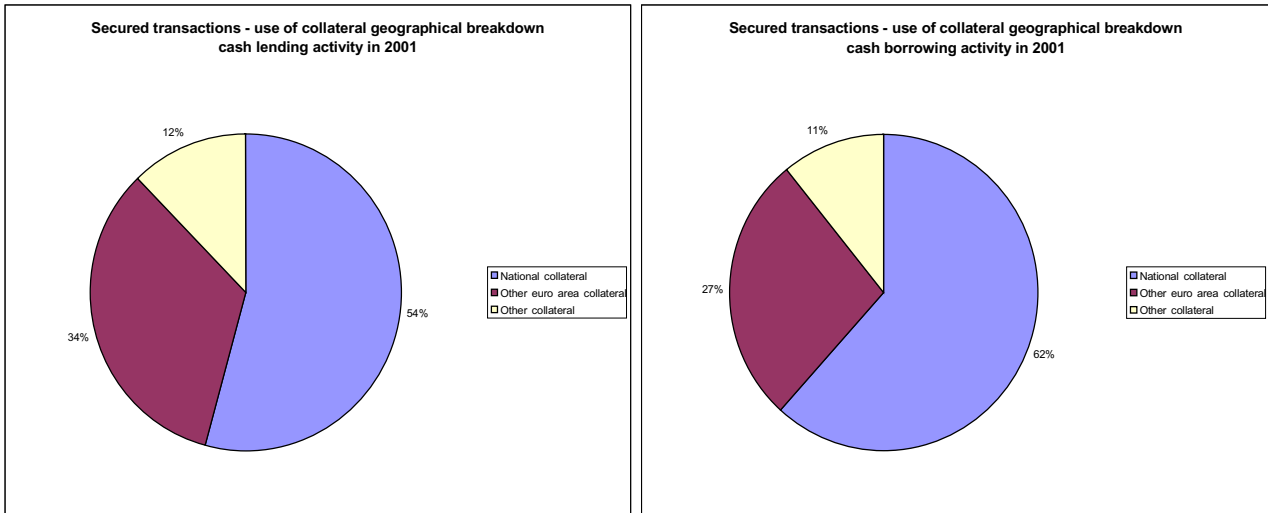
12 In the cash-borrowing segment, the share of national collateral remained rather stable at 62.1 % in 2000,
13 and 61.6 % in 2001. The share of other euro area collateral dropped somewhat from 30.1 % in 2000 to 27.5
14 % in 2001. Similar to the cash-lending segment, the weight of other collateral increased from 7.8% in 2000
15 to 10.9 % in 2001.

16

1
2

Chart 7
Collateral structure in terms of geographical origin of issuance

3



As regards concentration in the secured cash lending segment, the five largest players accounted for 39 % of the total 2001 turnover, the ten largest 60 %, and the 20 largest 78 %. The corresponding figures for secured cash borrowing are 48 %, 62 % and 79 %, respectively. Although direct comparison with the unsecured segment is not valid because of the different number of credit institutions considered in both segments, it can generally be concluded that the repo markets are characterised by a higher degree of concentration, which compared to the unsecured segment has even increased.

Table 2: Share of the largest players

	Secured cash lending		Secured cash borrowing	
	2000	2001	2000	2001
5 largest players	35 %	39 %	44 %	48 %
10 largest players	51 %	60 %	54 %	62 %
20 largest players	66 %	78 %	70 %	79 %
Number of reporting institutions	71	81	67	84

3.3.4 Comparison with the European Repo Council (ERC) survey⁴

⁴ The European Repo Council (ERC) is a regional repo council under the International Repo Council, a special interest group established by the International Securities Market Association (ISMA) and the Association Cambiste Internationale (ACI) for members active on the international repo markets. Its members comprise the major banks and securities houses active on Europe's cross-border repo market.

Since June 2001, the ERC has been conducting biannual surveys of the repo markets in Europe. These surveys ask a sample of banks in Europe for the value of the cash leg of repo and reverse repo contracts outstanding on the second Wednesday in June, and again in December.

However, the results of the ERC survey are only partly comparable to the present study because the ERC survey

- does not differentiate between repos and reverse repos, meaning that the outstanding volume consists both of lending and borrowing activities;
- is geared to stocks, whereas the present study is more a flow analysis;
- also includes other currencies than the euro.

Nevertheless, some comparison between the two ERC studies and this report is possible.

Firstly, the ERC surveys confirm the rapid growth of the repo business. Between June and December 2001, the aggregate outstanding value of repo contracts of banks participating in both surveys grew by 13 % (equivalent to a compounded annual rate of growth of about 28 %).

Secondly, a difference concerning the maturity structure should be pointed out.⁵ It is striking that the ERC survey identifies considerable repo business with a remaining maturity of more than one month (38.3 % at least a month; 54.9 % 1 day to 1 month; 6.8 % forward to forward repos). These results do not match those of this report, which finds that maturities above one month are more or less negligible. This discrepancy can, however, be mainly attributed to differences in methodology, and can be summarised into six categories. Firstly, whereas this report queried initial maturity, the ERC studies focused on the residual maturity, making a direct comparison misleading. Secondly, the flow methodology used in this report tends to show larger volumes as it includes intra-day trading activities and adds up the daily volume for overnight transactions and for the roll-over of short-term maturities, while the stock analysis of the ERC repo survey purely displays a snapshot of one day. Therefore, this report shows a higher volume for overnight transactions. Furthermore, it might be traced back to the different composition of the two underlying groups of surveyed banks.

Thirdly, concerning the trading structure, the December ERC survey found that 44.7 % of reported outstanding repo contracts had been negotiated directly with the other counterparty (of which 39 % were settled bilaterally and 5.7 % under triparty repo arrangements), 40.1 % through voice brokers and 15.2 % through inter-dealer automatic trading systems (ATS). Compared with the June ERC survey, these figures reflect a shift of business to electronic trading. Concerning the preferred dealing technique, the findings of

⁵ The relevant comparison is the ERC June 2001 survey, because the survey underlying this study captures the second quarter of 2001. Moreover, the result of the recent December ERC survey might be distorted by usual end-of-year considerations and by some movements sparked off by the events of 11 September.

the ERC survey thus more or less coincide with the results of the present survey, ascertaining that approximately 51 % of repo transactions are executed directly, 36 % via voice broker and 13 % via electronic systems.

Fourthly, as regards the counterparties, the December ERC survey reveals that 45.6 % of reported outstanding repo contracts were with national counterparties, 22.2 % with counterparties in the euro area and 22.6 % with counterparties outside the euro area. Moreover, 8.7 %⁶ were negotiated anonymously on an ATS and settled with a central clearing counterparty. In this context the ERC survey indicates a shift from transactions with national counterparties and cross-border counterparties in the euro area to transactions with cross-border counterparties outside the euro area, which appear primarily to be banks in London. With respect to the relative share of national counterparties and counterparties outside the euro area, the results of the ERC survey and this report coincide. This report assigns 42 % of the business to national counterparties and 20 % to other counterparties, whereas the comparable ERC figures are 45.6 % and 22.6 %. The only relevant difference consists in the relative share of euro area counterparties, which according to this report carries more weight (38.0 % compared to ERC's 22.2 %).

Fifthly, regarding the collateral structure, the ERC survey ascertains that 78.3 % of repo collateral held by participating banks was issued in euro area countries, with the rest being mainly composed of collateral from the UK (11.2 %). Generally, the results of this report support the ERC figures, indicating that the share of euro area collateral is even higher (in 2001, the share amounted to approximately 88 % for cash lending secured business, and to 89 % for cash borrowing secured business).

Finally, with regard to concentration, the ERC survey finds that in the view of the 55 participating banks, the top ten banks accounted for some 60 % of total reported repo business, and the top twenty for 82 %. In this respect this results of this report and the ERC survey are comparable, as according to the present report, the 10 largest players provide 60 % of the secured cash lending business and 62 % of the secured cash borrowing business. Comparable figures for the 20 largest players are 78 % and 79 %, respectively.

3.4 Developments on the OTC derivatives markets

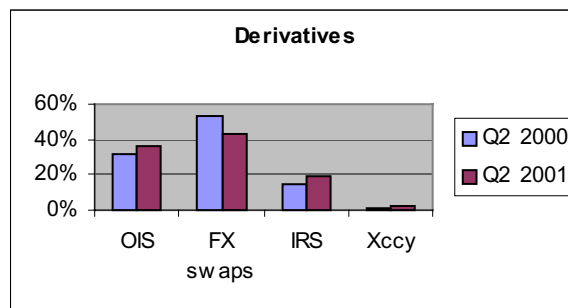
3.4.1 Turnover analysis

Turnover data were collected on the following euro-denominated OTC derivatives market segments: the interest rate swap market, comprising OIS and others (IRS), and the foreign exchange market, comprising foreign exchange swaps (FX swaps) and currency swaps (cross-currency swaps or XCCY).

⁶ The difference between this and the 15.2 % mentioned above can be traced back to business on ATS that offers name display (no anonymity) or name give-up (pre-trade anonymity only).

Chart 8

Development of market shares in the various segments of the swap markets



While keeping in mind the difficulty of comparing segments due to the different number of reporting banks, it can be concluded that the market for foreign exchange swaps remains the most important OTC derivatives market segment, followed by the OIS market, the IRS market, and the XCCY segment. The latter two segments are however the most dynamic ones, and recorded growth rates of 50% and 44%, respectively. In comparison, the OIS market grew steadily by 28%, whereas the foreign exchange market contracted (- 8%).

Possible explanations for the absolute and relative decline in foreign exchange swap turnover are the reduced activity on the (spot) foreign exchange market in general and the diminished attractiveness of these swaps as tools for hedging and position-taking on the interest rate market. Other instruments (such as OIS) may be more convenient for that role.

The increased attractiveness of the interest rate swap curve as the benchmark money market curve, combined with the growing range of players using interest rate swaps (dealers, end-investors, governments, etc.), who have quickly learnt the advantages of referencing to a single euro swap curve instead of choosing from among 12 government yield curves, may have contributed to the strong growth of the interest rate swap market.

The growth of the cross-currency swap market is also recorded in other surveys⁷ and seems to have been fuelled by the large volume of syndicated loans and securities issues. Growing issuance in the euro bond market with the aim of swapping the proceeds into other currencies may further explain this expansion.

A wide range of participants are active in the OIS market segment. In addition to cash market participants, money-market funds, ALM entities and hedge funds or firms have become used to trading actively on the OIS market. The reasons reported in last year's study for the OIS still apply, i.e. they are used in position-taking and in hedging short-term funding risk, are easy to trade in large volumes, and function as a liquidity management tool. The use of EONIA swaps in connection with the refinancing operations of the

⁷ See the box on the BIS triennial survey in section 3.4.4

Eurosystem may also have contributed to this expansion. Reporting institutions also mentioned that strong interest in OIS from customers, especially leveraged funds, has boosted turnover (see also section 4.1).

Box I

Use of EONIA swaps in connection with the Eurosystem's main refinancing operations (MRO)

Financial institutions can hedge their liquidity position, improve the conditions at which they can bid in the tender, or conduct profitable arbitrage by using these swaps.

The following example illustrates this. It is assumed that:

- a 2-week EONIA swap is quoted on Monday (T-2) at 3.30% (interest on the fixed leg of the swap). Anticipating a lower rate at the upcoming MRO, bank X concludes a swap on Monday for value T (settlement date of the swap and of the MRO), thereby paying out a floating interest rate (EONIA) against receipt of a fixed rate (3.30%).
- at the MRO Bank X will bid at 3.28%, slightly above the expected marginal rate.

The liquidity obtained at the MRO can always be invested daily on the overnight cash market so that Bank X will be insulated from spikes in very short-term interest rates, while still gaining a positive spread.

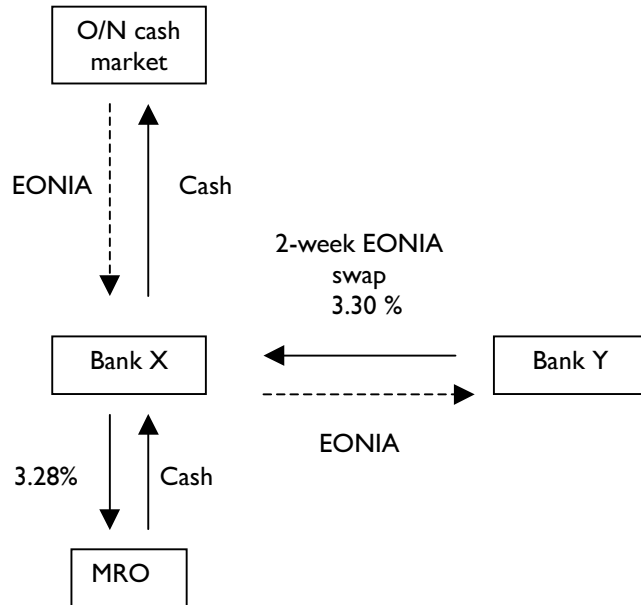
In order to have a quasi-perfect hedge:

- the value dates (spot and forward) of the EONIA swap and of the MRO must perfectly match;
- the notional amount of the EONIA swap must be equal to the allotted amount to Bank X. Therefore broken date swaps that coincide with the duration of the MRO may be necessary;
- the day-to-day O/N investments in the cash market must be as close as possible to the EONIA level.

The following chart illustrates this strategy:

Chart 9

Use of an EONIA swap transaction by a bank participating in the main refinancing operation



On balance this will result in the following cash flows and interest payments:

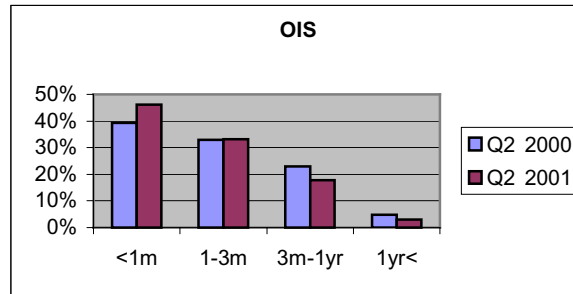
	Cash Flows	Interest Payments
MRO	+	+ 3.30 % (fixed leg of EONIA swap)
O/N cash market	-	- 3.28 % (interest payment on ECB tender)
Balance	0	- EONIA (floating leg of EONIA swap)
		+ EONIA (investment cash on O/N market)
		Balance: + 2 basis points

3.4.2 Maturity analysis

3.4.2.1 The overnight interest rate swap market (EONIA swap market)

Chart 10

Breakdown by maturity for 2000 and 2001 on the OIS market

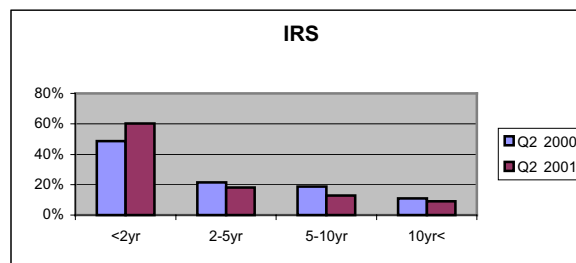


Short-term EONIA swaps (below one month) represented almost 50% of total OIS market activity in Q2 2001. The growth of the OIS market is mainly concentrated in the shorter maturity: primarily in EONIA swaps below one month (+50%) and, to a lesser extent, from one to three months (+29%). In the longer maturity (above one year), turnover stagnated or even declined.

3.4.2.2 Interest swap market

Chart 11

Breakdown by maturity for 2000 and 2001 on the IRS market



The strong growth of the IRS market (+50%) is particularly visible in short-term interest rate swaps (below 2 years), which recorded the strongest growth. This maturity bracket was already the most important one in Q2 2000 (with 49 % of the total IRS volume), and its importance has further increased to 60 % of the total IRS volume in Q2 2001. Activity in the five to ten years segment stagnated, while in the other maturity brackets volumes actually decreased.

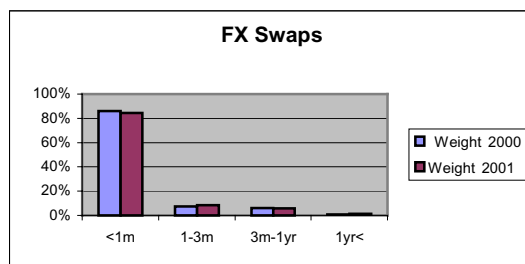
3.4.2.3 Foreign exchange swaps and currency swaps markets

The decline (by 8% between 2000 and 2001) in FX swaps turnover is in the shorter maturities (below 1 month) and to a certain degree in the “three months to one year” maturity bracket. Although they remain

quite marginal in absolute size, longer dated (above 1 year) foreign exchange swaps have increased substantially.

Chart 12

Breakdown by maturity for 2000 and 2001 on the FX swaps market

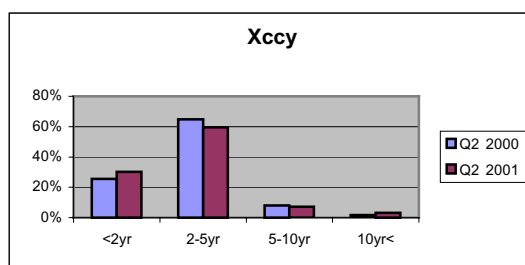


On balance, the maturity composition of foreign exchange swaps has remained broadly stable from year to year. The maturity bracket below 1 month remains by far the largest (86 % of the total FX swap volume).

Furthermore, statistical and anecdotal evidence suggests that the number of active market makers is declining, and that there is a growing tendency to conduct FX swaps for broken dates.

Chart 13

Breakdown by maturity for 2000 and 2001 on the XCCY market



The importance of currency swaps remains modest although, unlike the evolution in FX swaps, turnover (i.e. cross-currency swaps) is increasing, especially in the short (below 2 year) and the very long maturity brackets (above 10 years). The initial level was, however, very low.

3.4.3 Market structure

In general, survey respondents perceived the IRS and the OIS markets to be the most efficient market segments, closely followed by the FX swap market. The cross-currency swap market was assessed to be much less efficient. The main reasons for this are the lower activity in this segment, the complexity of the product and the fact that there are very few market makers.

When assessing liquidity, reporting institutions saw the greatest improvement in the OIS market, followed by the IRS market. Again, the XCCY market was seen as progressing the least. In all segments, however, participants considered that liquidity conditions had improved rather than worsened.

Direct trading is dominant in most derivative market segments, especially on the XCCY market. On the OIS market nearly half of the turnover is transacted through voice brokers. Voice brokers are also important on the IRS market (around 40%). With the exception of the FX swaps market, electronic brokering remains rather marginal.

Bid/ask spreads in the IRS and OIS markets are very narrow: spreads of 1 to 2 basis points are very common, although screen prices usually indicate 3 basis points. In these market segments the normal standard size per deal is EUR 2 billion between professionals, although sometimes multiples of this amount are transacted, especially in the shorter maturity segment. In the customer segment the transaction size varies from EUR 200 million (real money managers) to EUR 5 billion or a multiple of this amount (leveraged fund community). Comparable bid/ask spreads prevail in the FX swap market.

The survey data show that activity is highly concentrated. The 10 largest players cover on average 78 % and the 5 largest players on average 60 % of total turnover. It should be noted that concentration is particularly high in the cross-currency swap segment due to the overriding importance of one institution.

Table 3: Degree of concentration

2001	OIS	FX swaps	IRS	Cross-currency swaps
5 largest players	48%	54%	60%	79%
10 largest players	68%	74%	77%	91%
20 largest players	88%	91%	90%	98%
Number of reporting institutions	98	97	102	89

Geographically, trading on these market segments is mainly conducted out of London, Frankfurt and Paris. The importance of London-based banks seems to be more pronounced on the IRS market and the cross-currency market, whereas Paris-based banks seem to dominate the OIS market.

3.4.4 Comparison with the global OTC Derivatives Market BIS Survey

As already mentioned, the broad general trends and developments described in this report seem to be corroborated by the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, despite the differences in methodology⁸ and coverage between the two surveys.

⁸ The box in annex 3 summarises the main methodological differences between both surveys. As the ECB survey measures turnover

Summary results of the global OTC derivatives market Triennial Central Bank Survey

The Triennial Central Bank Survey collected data for April 2001 turnover in over-the-counter-interest rate and foreign exchange derivatives and amounts outstanding of OTC interest rate and exchange derivatives at end-June 2001.

Turnover: Turnover data showed that the interest rate segment is gradually catching up with that of foreign exchange. Expansion in the interest rate segment has been primarily driven by interest rate swaps, mainly USD and euro-denominated swaps.

According to the BIS report, the introduction of the euro has led to the creation of a large and liquid market in euro-denominated interest rate swaps. The euro-denominated swap curve has become a new benchmark for European fixed income markets as European government bond markets have remained heterogeneous. In April 2001, more than 60% of the activity in euro-denominated swaps was cross-border.

Trading volumes in foreign exchange swaps fell between 1998 and April 2001 - although this was less pronounced than on the spot market - being negatively affected by the consolidation in the banking industry and the international concentration in the corporate sector. The main exception to the downward trend in currency-related derivatives was in currency swaps. Currency swaps involving the euro accounted for around 30% of the reported turnover in April 2001. With a share of more than 80%, the USD was still dominant.

Around two-thirds of the activity in foreign exchange and currency swaps involving the euro took place on a cross-border basis. Regarding the maturity breakdown, foreign exchange swaps involving the euro were mostly concluded for short-term maturity: 65% of total turnover was in the up to and including 7 days maturity segment, and 34% over 7 days up to and including one year. Over one year the turnover was marginal (1%). The same proportions held for EUR/USD swaps; however, for EUR/JPY swaps the breakdown was somewhat different at 38%, 60% and 2%, respectively.

In terms of geographical distribution, the most important EU marketplaces for the turnover in interest rate products were the United Kingdom, Germany, France, the Netherlands, Italy, Spain and Belgium.

Notional amounts: As for statistics in terms of turnover*, the stock of single interest rates products (especially the interest rate swap market) grew strongly as opposed to foreign exchange instruments. In terms of relative size, euro-denominated interest rates swaps accounted for 34% of reported notional amounts outstanding in all currencies, compared to 31% for the USD and 18% for the JPY. The growth of

or volumes, only the turnover section (not the part concerning outstanding amounts) of the BIS survey is taken into consideration.

positions in euro-denominated interest rate swaps is related to the use of these swaps as a new benchmark for European fixed-income markets after the introduction of the euro.

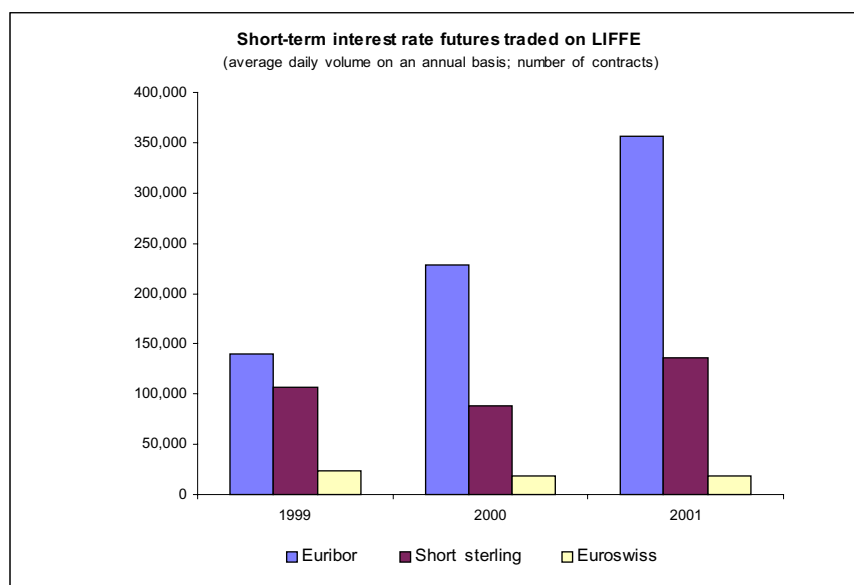
3.5 Developments on short-term interest rate futures and options markets

3.5.1 Turnover analysis

Activity on the euro futures and options markets increased by 70% in 2001, according to data published by derivatives exchanges. The main developments in the EURIBOR futures contract, which are designed for traders to take views on euro short-term interest rates, can be found in turnover data published by the London International Financial Futures and Options Exchange (LIFFE). This represents over 99% of the total turnover of short-term interest rate futures contracts, with the residual percentage traded on Eurex. Data from LIFFE shows that the number of Euribor contracts traded on LIFFE increased by 56% during 2001, with volumes more than 2.5 times the size of those transacted in 1999. At the end of December 2001, the number of open interest contracts had increased by 25% over the previous twelve months, the same rate of growth as seen in 2000.

Chart 14

Average daily volume traded on LIFFE for short-term interest rate future contracts



Euribor futures continue to be the most actively traded short-term interest future contracts in Europe, and accounted for 69% of futures activity (by volume) on LIFFE in 2001. Short sterling accounted for 27%, with Euroswiss futures declining to fewer than 4% of all futures trades.⁹

⁹ The unit of trading in a Euribor contract is EUR 1 million; in a short sterling contract £ 0.5 million, and in a Euroswiss contract SFr 1 million.

Euribor options also benefited from strong growth, increasing by 170% in 2001, outperforming the wider options market by 66%, and accounting for 73% of the market by end 2001. The wider market grew at 140% over the year, after a 7% rise in 2000.

3.5.2 Developments on futures and options exchanges

LIFFE's important role concerning short-term interest rate options and futures traded on Euribor continues to reflect the "concentration effect", meaning that investors favour the most liquid markets when they need to hedge their positions. As noted in the last report, this process is made possible by the standardisation of contract terms that are found on an organised exchange. In a significant development for market concentration, LIFFE shareholders agreed to its sale to Euronext, the deal becoming final in December 2002. Euronext is in the process of moving all of its derivatives business onto LIFFE's electronic trading platform (Connect).

3.6 Developments on the short-term securities market¹⁰

The short-term securities market includes government securities (T-bills) and private securities. The private securities mainly comprise commercial paper (CP) issued by non-financial corporations and certificates of deposits (CDs) issued by banks. Short-term securities can be issued from inside the euro area, or from outside the euro area, like the Euro Commercial Paper market, on which the major dealers are international, mostly London-based, banks.

As regards the secondary market, the survey shows that the volume of transactions on short-term securities has expanded significantly, although remaining far below the volumes traded on other segments of the money market. Overall, growth reached 34 % in 2001. The volume of outright transactions on certificates of deposits expanded by 47 %, the highest increase recorded, while its share in the total volume of transactions for short-term securities increased from 26 % to 28 %. About half of the transactions on short-term securities (50 % in 2000 and 49 % in 2001) are still related to transactions on T-bills, which increased by 29 % in the reporting period. Finally, transactions on non-bank commercial paper increased by 29 %, and currently represent 23 % of global transactions. However, it must be noted that due to the very short initial maturity of CDs and CP, these developments on the secondary markets of these instruments are relatively marginal.¹¹

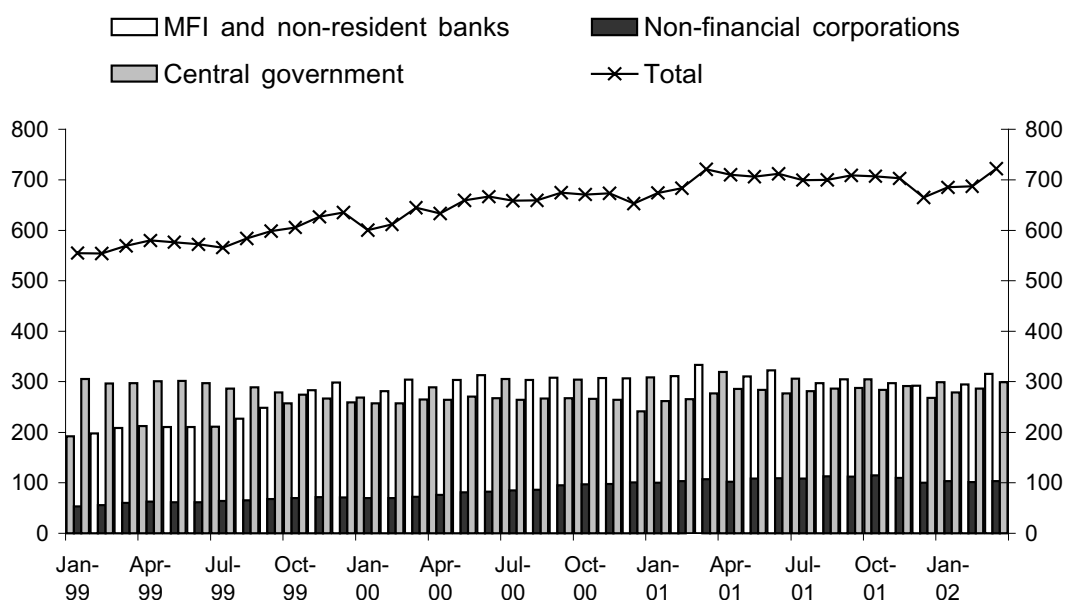
¹⁰ This section draws both on the information obtained from the market survey and on data from the ECB's securities database. Information on the French segment is based on data gathered from the Banque de France's securities database for the private segment of the market.

¹¹ For example, as regards the French market, 42% of the commercial paper and 52% of the certificates of deposits issued in June 2002 had an initial maturity of up to three days only.

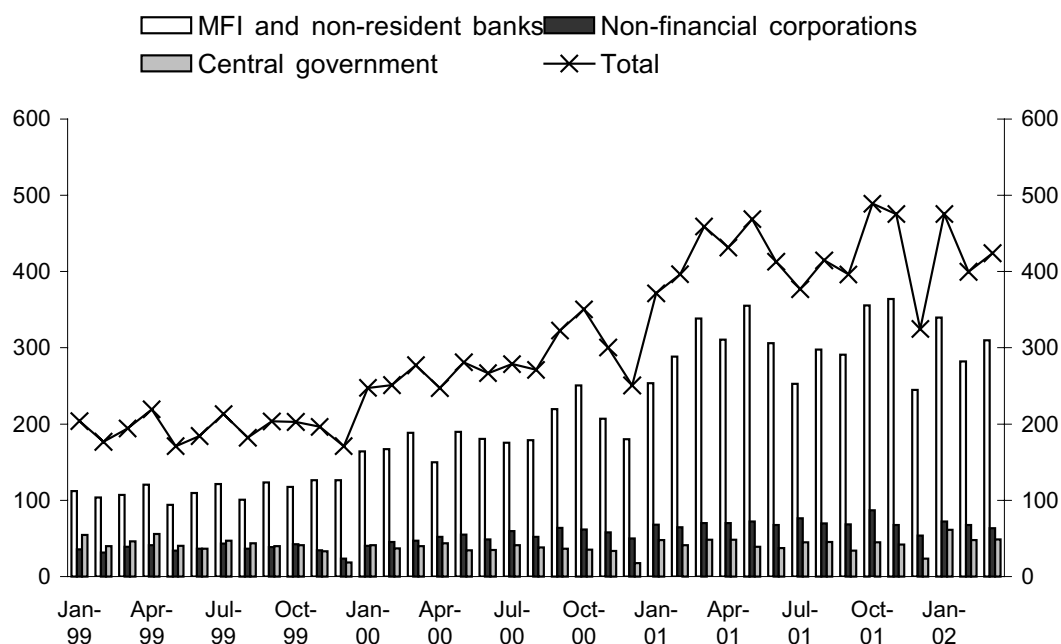
The outstanding stock of euro-denominated short-term securities increased from EUR 653 billion in December 2000 to EUR 665 billion in December 2001, after a peak of EUR 721 billion had been reached in March 2001. Since then, it has increased to EUR 722 billion by March 2002 (see chart 15 below). As concerns the breakdown by issuer, the outstanding amount of short-term securities issued by the private sector has surpassed that of the public sector since October 1999. Banks and financial corporations represented 44% of the total outstanding amount in December 2001 (compared to 47% in December 2000), while the public sector accounted for 40% (compared to 37% in December 2000).

Chart 15

Outstanding amounts of euro-denominated short-term securities by issuer sector since January 1999



As concerns the total gross issuance of short-term securities, the significant increase observed in 2000 continued in 2001 at an even higher pace, amounting to EUR 325 billion in December 2001, compared to EUR 251 billion in December 2000, after having peaked at EUR 489 billion in October 2001 (see chart 16 below).

Chart 16**Gross issuance of euro-denominated short-term securities by issuer sector since January 1999**

For the whole of 2001, gross issuance of short-term securities amounted to EUR 5,016 billion, which represents an increase of 50% compared to 2000. As already observed in 2000, the largest growth in gross issuance concerned banks and financial corporations, amounting to 62%. The gross issuance of the central governments increased by 15% in 2001 in comparison with 2000. As a consequence, the share of banks and financial corporations in the total gross issuance of short-term securities rose from 68% in December 2000 to 75% in December 2001.

The French market, the biggest domestic market in Europe, illustrates the growing importance of these securities as a source of financing for companies. During 2001, outstanding amounts on the commercial paper segment, reserved for non-bank issuers in France, varied between EUR 78 billion and around EUR 90 billion, the latter constituting a record high.¹² The growth of the market has also been fostered by the increase in large issuance programmes, mainly by non-resident issuers.¹³ Moreover, the market continued to be fuelled by special purpose vehicles (SPV) issues of asset-backed CP, which accounted for 20% of the total outstanding amounts in December 2001.¹⁴ From a regulatory point of view, the range of players able to

¹² The annual gross volume of issuance confirmed this growth trend, standing at EUR 930 billion in 2001, compared with EUR 700 billion in 2000.

¹³ As an example, the issuance programme of General Electric, the largest issuer on the market, increased from EUR 15 billion to EUR 25 billion.

¹⁴ In the second quarter of 2002, the French market experienced its first notable contraction (circa -20% in the amount outstanding). This was triggered by downgrades of large CP issuers and by the decision of others to lengthen the maturity profile of their debt and thus reduce their reliance on CP. The German domestic market experienced an equivalent development. However, the contraction registered on those European markets was much smaller than that of the US CP market (-51% between August

participate in the French CP market (*billet de trésorerie*) was broadened, as local administrations were authorised to issue commercial paper. The outstanding amount of certificates of deposits in France increased by almost 20% to EUR 154 billion at the end of 2001¹⁵. This sharp increase was due to investors' appetite for very short-term issues mostly, but also due to increasing issuance activity from some large national banks as well as the growing presence of non-resident credit institutions.

The second largest European market is the euro commercial paper market (ECP market), which is tapped by credit institutions, non-financial corporations, and public authorities. The size of aggregated national CP markets, in terms of outstanding amounts, outbalanced the size of the ECP market only briefly at the end of March 2002, according to CP Ware sources (outstanding amounts of EUR 323 billion and of 318 billion, respectively). More than 90 % of issues on the domestic markets are euro-denominated. The euro-denominated share of the ECP market has steadily grown from slightly more than 10% in January 1999 to a historical high of more than 36% in August 2002. The US dollar-denominated share, on the other hand, decreased from more than 50% in January 1999 to a historical low of less than 39% in August 2002. Moreover, in August 2002 for the first time new euro-denominated issues on the ECP market outnumbered new US dollar-denominated ones. With more than EUR 100 billion of monthly issuance of euro-denominated ECP, the role of the euro on this market has clearly become more prominent. The ECP market benefits from lower administrative costs since it is neither regulated nor supervised by any market authority.

It is worth noting that the short-term securities market may profit from the enforcement of the Directive dated 21 January 2002 modifying the Directive 85/611/EEC on UCITS, extending the range of financial assets in which collective investment undertakings benefiting from a single licence may invest. The implementation of the amended UCITS Directive into national law should allow UCITS to invest without any restriction in money market instruments, provided that the instruments are liquid and have a value that can be accurately determined at any time. Moreover, a sufficient level of both investors and savings protection must be ensured by the fulfilment of some conditions on the issues and the issuers. The uniform implementation of the UCITS Directive by all Member States represents a crucial step towards the creation of a pan-European market for short-term securities.

2000 and August 2002). (It should of course be noted that at least part of the contraction of the outstanding volume at a given point in time is explained by the observed shortening of the initial maturity of the newly issued CP).

¹⁵ At around EUR 170 billion, November 2001 constituted a record high. The annual gross volume of issuance was EUR 3,300 billion, i.e. an increase of around 80% in 2001.

4. Changing structures of the money market

4.1 The importance of the EONIA swap market

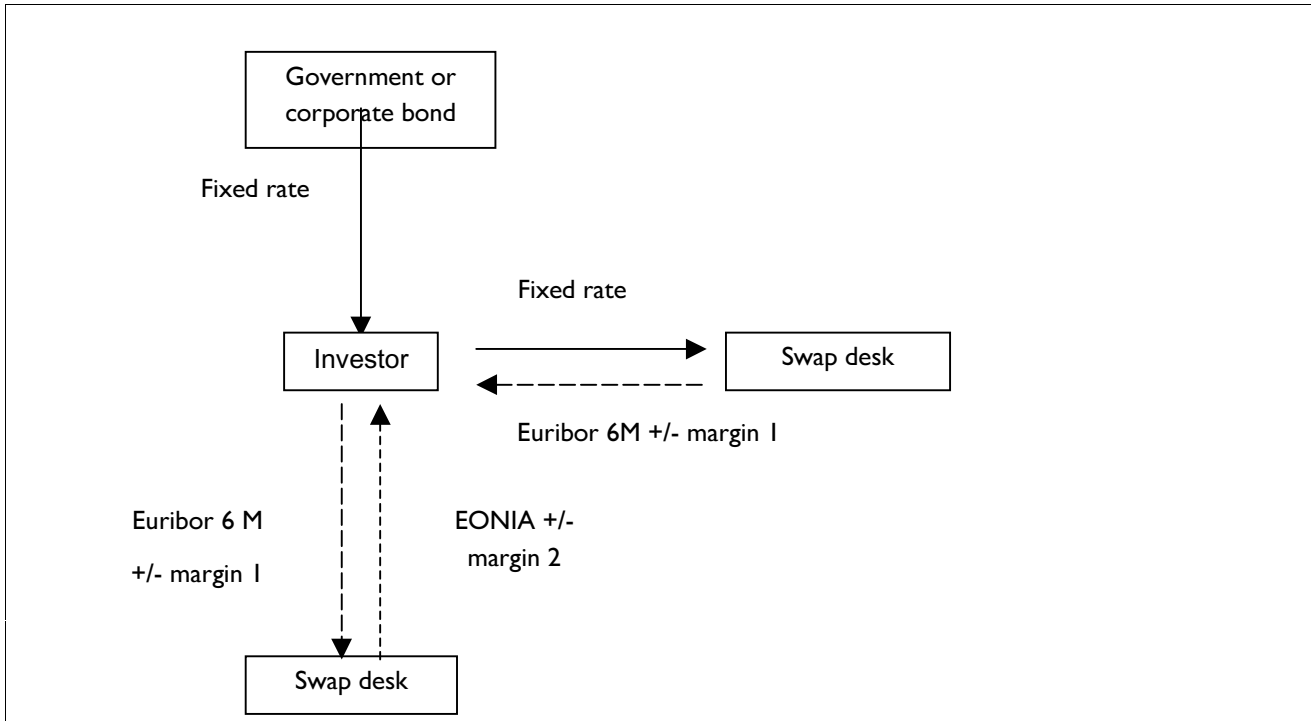
Since the introduction of the euro, the money market has been characterised by an increasing indexation to the EONIA, especially via the use of overnight index swaps (OIS). The survey on the second quarter of 2001 confirms the dynamism of the EONIA swap market, with a further 28% increase in volume. The following section describes the various uses of OIS swaps.

Banks mainly use EONIA swaps for hedging short-term interest rate risks, conducting profitable arbitrages, or for position-taking on the shape of the money market curve (see also chart 9). Banks, which are granted liquidity through the Eurosystem tender at a fixed rate (the average rate of individual allotment), may conclude OIS swaps, in which they pay the capitalised EONIA and receive a fixed rate, so as to transform their fixed debt into a variable one. By doing so, banks which mainly trade on the cash market in variable rates can immunise their in and out cash-flows, neutralise the interest rate exposure, and cover their liquidity needs over a long period without taking the risk of setting their borrowing cost. Such a hedging strategy is used in a broad sense, that is to say, not only related to the MRO participation but also related to any cash borrowing on the interbank market.

In the same vein, investors may be interested in turning a fixed income asset into a floating asset with an EONIA reference. For short-term assets, a fixed rate / EONIA swap may be directly concluded. However, such swaps are not yet commonly used for longer maturities, although some market makers provide quotations. To circumvent the liquidity problem due to the size of this market, investors may first conclude a fixed rate / Euribor 6 months swap, and then enter in basis-swaps, i.e. EONIA / Euribor swaps, to convert their Euribor referenced-income into an EONIA one (see the following chart). Not only the maturity but also the value dates and the notional amount of the asset of the two swaps must match exactly.

Chart 17

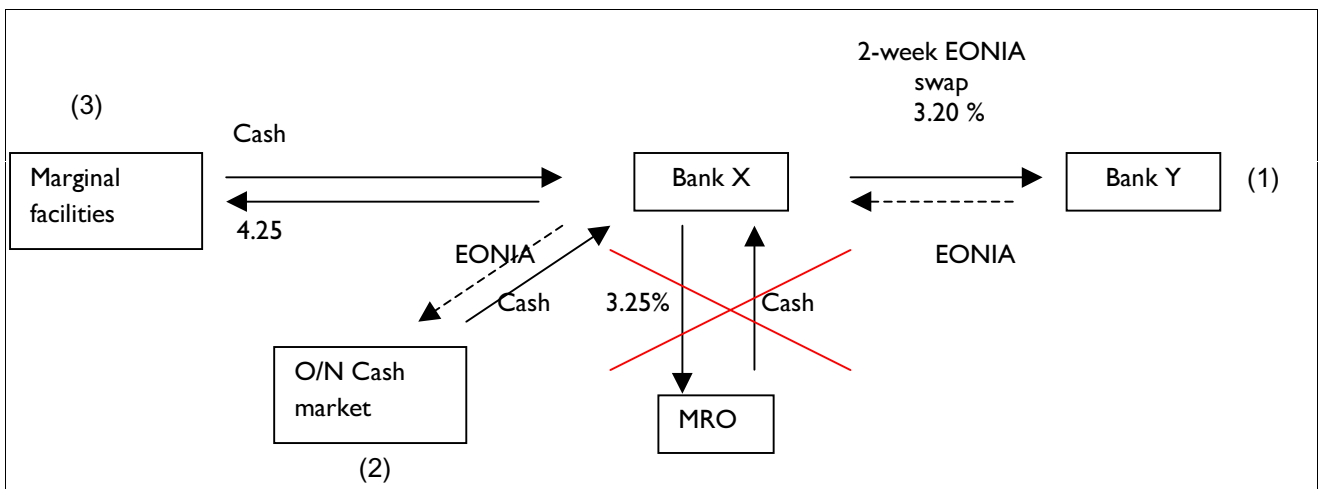
Example of an EONIA/EURIBOR swap transaction



In periods characterised by strong rate cut expectations, the use of OIS swaps also allows investors to borrow money at a cheaper rate compared to the MRO one. As soon as the fixed leg of the 2 weeks EONIA swap is quoted below the minimum MRO bid rate, banks may not be interested in bidding in the MRO.

Chart 18

Swaps and MRO rates



As outlined above (1+2), banks lock the cost of money at 3.20% for the same maturity, compared to a 3.25% cost via the Eurosystem tender. It should nevertheless be noted that, if the low participation of banks in the MRO prevents the Eurosystem from allotting the adequate amount of liquidity to the market (1+3), banks could be forced to borrow money at much higher rates than EONIA, potentially even through the Eurosystem marginal lending facility.

In such circumstances, the following considerations have to be made. First, with such a mechanism, banks which covered their non-participation in the MRO via swaps are hedged against the upward trend of the EONIA. The risk remains of borrowing the cash at a higher level than EONIA (one example could be to recourse to the marginal lending facility, as long as the EONIA rate is below the marginal lending facility rate). Second, smaller banks, usually having recourse to the market to fund their activities, may on the contrary suffer in an underbidding scenario if they have not anticipated it, as they may be forced to raise cash through the Eurosystem marginal lending facility or to borrow cash on the interbank market at an even more prohibitive cost if have no collateral available.

Last but not least, OIS swap rates are commonly used to take positions according to expectations of a change in monetary policy. Market participants also use OIS swaps to implement money market curve strategies in order to take advantage of the shape of the curve. For example, investors anticipating a rate cut may be interested in concluding swaps in which they pay the capitalised EONIA and receive a fixed rate. Receiving capitalised EONIA may, on the contrary, be profitable in case of a rate hike.

Such position-taking is quite favoured as it does not create distortions in investors' cash-flows, especially with regards to the fulfilment of minimum reserves. Furthermore, OIS swaps, being off balance-sheet operations, require only a low consumption of regulatory capital.

4.2 The triparty repo

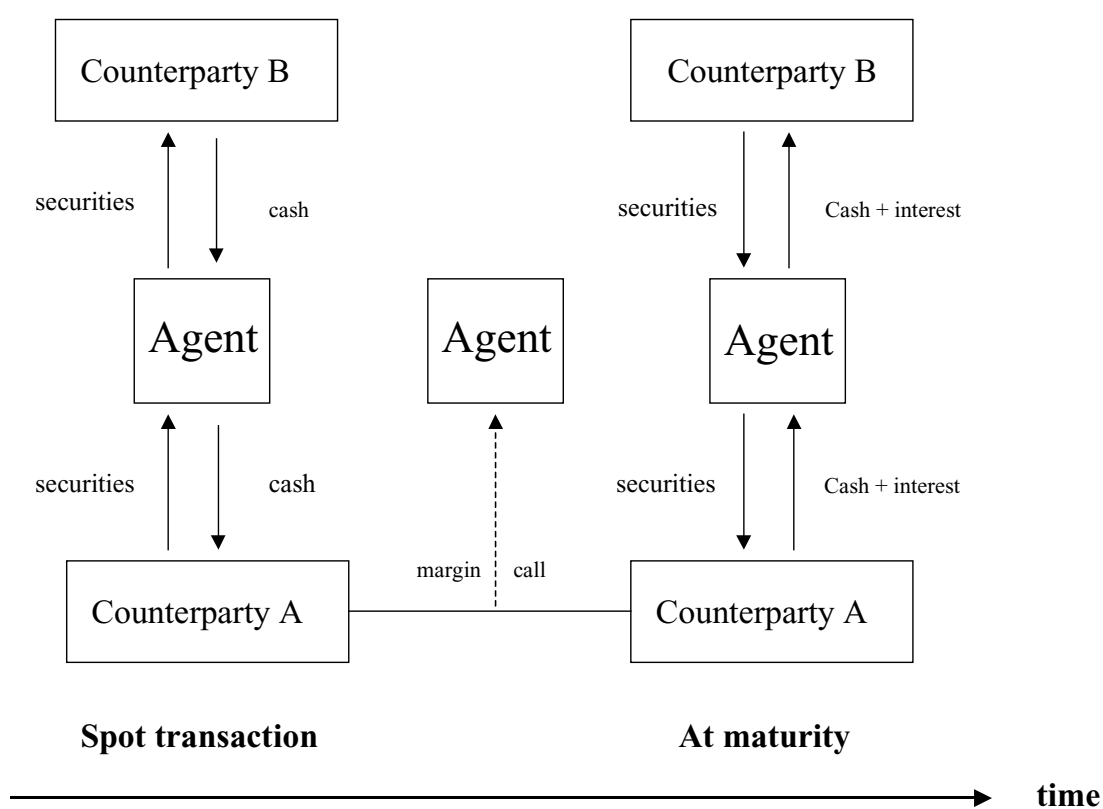
The triparty repo market, a specific segment of the repo market, seems to be developing further, as market participants appreciate its benefits (see box). The main force driving this development is the ability of market participants to agree on any kind of collateral beyond the government bond type of general collateral mostly used so far.¹⁶ Moreover, the delegation of the clearing and settlement aspects of the transactions to one agent (the third party) specialised in this issue ensures efficiency.

Box 3

The tri-party repo transaction

A tri-party repo transaction is a transaction between two parties, whereby they agree to exchange cash against collateral via an agent. The main difference from standard repo transactions is that the collateral

used is not necessarily the general collateral used for standard transactions, consisting of government bonds. Instead, the collateral can be any security defined as eligible by both counterparties. Before the counterparties start entering the transaction relationship, they list the securities eligible for collateral and thus define a basket of securities that will form part of the legal master agreement, backing the transactions. This basket of securities, which can also be considered as a new generic security, is exchanged for cash in each transaction. The agent (i.e. third party) to which the counterparties have delegated the clearing actually processes the transaction on their behalf, making sure that the settlement of the securities happens versus the payment of cash. Very often the agent is a prominent central securities depository.



The cash taker, counterparty A, can obtain financing with a new type of generic bond, while the cash provider, counterparty B, is able to achieve a higher return reflecting the average credit rating of the generic security.

The main benefit of such types of over-the-counter transactions is that market participants are able to **raise cash with other types of collateral than the very liquid government bonds**. The basket of securities can in the end consist of numerous securities in very small amounts. The basket can also go lower, in terms of quality, down the credit spectrum. The advantage thus is that a better return on the transaction can be obtained, which also means entering a kind of **“credit” transaction on the money market**, similar to the credit sector of the bond market. The credit sector of the money market, which

¹⁶ If the outstanding amount of government bonds shrinks, the lower supply of government bonds may also foster this development.

had previously mainly been composed of commercial papers (CPs) and certificates of deposit (CDs), has deepened significantly with the emergence of the tri-party repo market. Another main feature is that counterparties A and B **outsource the technicalities of the settlement and collateral management** with a delegation to the agent against fees, which represent the price to pay for simplifying the task of both parties, while alleviating the problem of market infrastructure fragmentation.

4.3 The development of electronic platforms

Although electronic transactions have continued to grow, the share of electronic trading still appears to be comparatively low and furthermore differs from one market segment to the other. While non-electronic transactions remain dominant for money market instruments per se, the success of e-MID and attempts to develop further the use of electronic trading for repo activity or for OIS swaps suggest that electronic trading has an important development potential in the euro money market.

With regard to unsecured cash transactions, most participants considered e-MID as the leading European electronic platform, with over 200 members, including a number of major international institutions. The average daily turnover of euro cash through this system reached EUR 18 billion by April 2002, up from EUR 16 billion in 2000 (compared with average EONIA volumes of around EUR 37 billion). Despite efforts to expand the use of the platform abroad, e-MID remains domestic-driven, with large Italian payers contributing most of the volume. Development potential within this segment remains high.

As far as the secured cash market is concerned, this report found that 13% of the transactions are traded via electronic platforms, a percentage roughly confirmed by the European Repo Council survey (which indicated 12%). BrokerTec (see Box 5 in annex 5) remains the leader in European bond repo transactions, while MTS (see Box 6 in annex 5) Italy records about EUR 40 billion average daily turnover, especially in Italian bonds. Volumes on the Repo Trading Facility on MTS continued to increase significantly.

The maturity of repo processed through ATS systems appears to be skewed to the short end with about 80% of GC trading done at T/N and S/N and with only around 5% at beyond one month. Italian and Belgian collateral are the most commonly used in euro GC transactions. Specials trading has largely focused on German government paper in 2001, but recent trends also show some growth in the French and Dutch markets. Specials tend to have a longer average maturity (around 11 to 12 days) with high demand at 3 and 6 months for stocks that are deliverable into futures contracts, balancing demand at the shorter end.

Most market participants feel that the use of electronic trading in repo activity could grow further, as it could reduce significantly back-office costs and become a favourite overnight and tom/next instrument for refinancing activity using general collateral. The launch in 2001 of an electronic repo activity by Eurex bonds (see Box 7 in annex 5), MTS France and the introduction of floating rate repos on MTS in the second quarter of 2002 (a new functionality which will allow the trading of repo based on the EONIA rate) confirms the development potential in this segment.

Recent attempts to set up multi-dealer platforms have been far from straightforward. Swapswire is not yet effective, but was planned for October 2002, while e-MIDER, the electronic overnight indexed swap market, which uses the same server architecture as e-MID or the French broker platform AtenX, still has low volumes (around EUR 1-2 billion a day).

As a whole, anonymity is the major benefit of ATS trading for most market participants, which can only be fully achieved by using a central counterparty clearing house (CCP)¹⁷. Use of a CCP also allows netting (which provides substantial benefits in terms of credit risk and regulatory capital consumption), reduces the burden of credit line monitoring, streamlines the settlement process and promotes improved management of collateral. ATS trading with straight-through processing can improve a trader's operational efficiency by eliminating the need for ticket writing. There has been considerable growth in CCP transactions on the European repo markets over the past year, and participants report that market liquidity has benefited as a result.

In markets without a CCP (currently Italy¹⁸, Spain and Greece), MTS and BrokerTec have for the moment engineered bilateral settlement arrangements. While these do not offer the full benefits of completely anonymous trading and netting, such systems may contribute to streamlining the settlement process.

5. Further progress towards integration

5.1 Important developments

One part of the euro area money market, the unsecured market, has reached a very high level of integration. However, other segments of the money market, especially the short-term securities market (see also section 5.2) and the repo market, are still not fully integrated across the euro area.

¹⁷ However, the e-MIDER system provides for anonymous trading up until the point a published bid or offer is hit, at which point the counterparties' names are revealed, so that credit lines can be checked. This check is necessary because, in the absence of a CCP, e-MIDER's participants are exposed to counterparty credit risk.

¹⁸ In Italy, the largest repo market currently without an electronic central counterparty, an agreement has been signed between MTS, Cassa di Compensazione e Garanzia (CC&G) and the clearing house Clearnet to provide a CCP for repo by the beginning of 2003.

After the introduction of the euro, the concept of a domestic market needed to be reconsidered, especially with respect to master agreements used as the legal document supporting transactions. The existence of various master agreements in different languages, with different characteristics and jurisdictional coverage, was not appropriate to the new situation and was also perceived as a hurdle for cross-border transactions. Participants felt that consolidation of legal agreements was necessary to help integrate domestic repo markets into one single repo market. The majority of participants moved to use the Global Master Repurchase Agreement (GMRA), as developed by the Bond Market Association and International Securities Market Association. The European Banking Federation (EBF) also published a legal agreement. This initiative set out to provide a common framework for repos, securities loans and derivatives. The EBF announced in January 2001 that the Master Agreement for Financial Transactions, commonly known as the European Master Agreement (EMA), was ready for use by the European banking industry.¹⁹

The developments affecting the repo markets in recent years have focused the attention of market participants. For example, in Greece the tax treatment favouring short-term investments via the repo markets relative to a standard deposit was altered at the beginning of 2002 with the introduction of a tax on the interest earned on repo transactions, making both types of investment more similar. The tax advantage was perceived as causing negative side effects on Greek domestic collateral, for example by creating a shortage of collateral, unfair competition elements, and discrepancies with other euro area collateral.

Another factor affecting repo markets is the trend towards the acceptance of a larger standard basket of generally accepted bonds as general collateral. Market participants seem to adjust this basket to most of the government bonds of the euro area. This development is also to be seen in relation to the creation of the EUREPO index by the European Repo Council and the European Banking Federation. It contributes to harmonise the price of collateral in the repo market among euro area government securities.

Box 4

Eurepo: The new repo reference rate¹⁾

The figures of this survey show that the European repo markets are growing significantly, with the importance of cross-border trades also increasing. This implies an increasingly homogenous euro-denominated general collateral market. Accordingly, market participants deemed the time ripe to introduce a representative benchmark (supplementing the existing reference rates for unsecured business, Euribor and Eonia). On 4 March 2002, the so-called 'Eurepo' was introduced as the benchmark for secured money market transactions in the euro area. Eurepo is the rate at which one prime bank offers funds in euro to

¹⁹ The EMA aims to consolidate various master agreements used for both domestic and cross-border transactions in the euro area and European financial markets into a single set of harmonised documents. The main advantage of this is that a common framework for repos, securities loans and derivatives would be created. In addition, it would also harmonise the terminology and the operational provisions with English and American legal standards. Finally, it is a multi-jurisdictional document which leaves the choice of law and language up to the parties' involved.

another prime bank, if in exchange the former receives from the latter Eurepo GC²⁾ as collateral. The main specifications of Eurepo are as follows:

- A representative panel of prime banks provides daily quotes of the rate, rounded to two decimal places, that each panel bank believes one prime bank is bidding another prime bank (and offering money) for term repo on Eurepo GC.
- For each maturity, the highest and lowest 15 % of all the quotes collected are eliminated. The remaining rates are averaged and rounded to two decimal places.
- Eurepo is quoted for spot value (T+2) and on an act/360 day count convention. It is displayed to two decimal places.
- The range of Eurepo's quoted maturity is T/N 1,2 and 3 weeks and 1, 2, 3, 6, 9 and 12 months.
- The panel of banks³⁾ quoting for Eurepo currently consists of 29 banks from EU countries that are in the euro area, 1 bank from an EU country not in the euro area, and 8 large international banks from non-EU countries but with important Euro repo operations.
- Eurepo is the successor to the BBA euro repo rate, which has been benchmarked since May 1999.
- The legal sponsor of Eurepo is EURIBOR FBE. Eurepo is supported by the leading European banking associations and the European Repo Council.

¹⁾ Information is taken from internet publications about Eurepo and a brochure published by Moneyline Telerate and the FBE.

²⁾ As defined for the purpose of Eurepo fixing. Eurepo GC exclusively consists of government bonds and bills issued by euro zone countries. The definition of a unique GC list is one of the merits of the Eurepo project.

³⁾ It should be underlined that the Eurepo and Euribor/EONIA panels are not identical. Whereas Euribor and EONIA are geared to transactions initiated within the Euro area, Eurepo also includes quotes resulting from London-initiated repo business.

5.2 Market initiatives to promote an integrated short-term securities market

The degree of integration on the short-term securities market remains significantly lower than in the other segments of the euro money market. In some of the euro area countries, the market is still at an early stage, with few transactions that are essentially domestically orientated. Cross-border business, although expanding, is still limited and most transactions are made between local market participants, issuers as well as investors such as mutual funds. Furthermore, legal and tax treatments, product characteristics and documentation still vary to quite some extent between countries. The need for increasing cross-border business from both the supply and demand sides, however, faces major constraints according to market participants, such as the difficulty of implementing a single settlement system, or of creating a uniform legal and tax framework.

These findings were also expressed by market participants represented in the ECB Money Market Contact Group²⁰, a discussion forum of ECB representatives and market practitioners. Members of the group have put forward a set of proposals to overcome the limitations identified, distinguishing between a set of pragmatic actions for the short-term and some more ambitious programmes for the longer term.

In order to find an appropriate grouping of euro area market participants outside the ECB Money Market Contact Group which could address this matter, a task force of market participants (the Short-Term Paper Task Force) was established in July 2001 by the ACI, the Financial Markets Association. To prepare a so-called 'White Paper', the task force investigated the conditions and the obstacles both for issuers of each country seeking to issue short-term papers, and for investors in all euro area countries looking to purchase assets issued in other countries.²¹ Moreover, the European Financial Markets Lawyers Group (with the support of the Eurosystem legal experts) has drawn up an extensive report investigating the current legal situation with regard to short-term debt securities under each of the various national laws of euro area member states.²²

As concerns the findings, the task force sees good potential for the development of the European short-term paper market. To achieve better integration of the domestic markets, the White Paper recommends that

- all domestic markets use a standard format for the Information Memorandum of commercial papers;
- the English version of this Memorandum should be available from the ECB, and that a yearly review should be implemented;
- a primary index on short-term paper issues, calculated by the ECB, should be created;
- the ECB should be in charge of collecting and publishing statistics;
- euro short-term papers, if certain conditions are met, should be eligible as Tier I;
- short-term papers should be classified in the same way in each transposition of the UCITS directive so that they could be purchased without restriction by UCITS, independently of the country of residence of the UCITS of the issuer and the dealer;
- short-term papers (with an initial maturity of less than a year) should be excluded from the proposed Prospectus Directive and its national transpositions;
- same day settlement should (in the medium term) be possible for all domestic and cross-border transactions;

²⁰ The Money Market Contact Group was established in the third quarter of 1999 by the ECB's Directorate General Operations. It consists of senior managers from institutions actively participating in the euro area money market, and serves as an informal forum for communication between market practitioners and the ECB to discuss money market-related issues.

²¹ The analysis and recommendations of the ACI Short Term Paper Task Force are reported in the document entitled "The Short-Term Paper Market in Europe", 2 September 2002.

²² The resulting analysis and recommendations are set out in a report entitled "The Money Market: Legal aspects of Short-term Securities", 2 September 2002.

- domestic legislation in the euro zone should adopt a common market format.

As a matter of fact, the proposed range of actions is very wide and the initiators are aware that they are dependent on the support of other market participants as well as national and European legislators. The White Paper therefore envisaged the opening of a consultation phase with other groups of market participants (issuers, investors and market associations such as ISMA, ISDA) with a view to devising potential collective actions as well as making recommendations to the relevant authorities. Subsequently, the ECB was asked to host, on the ACI Short-Term Paper Task Force's behalf, a consultation based on the above-mentioned two reports. In September 2002, the ECB launched this consultation on its website.²³

5.3 Sources of remaining market fragmentation

Although the survey highlights the fact that banks are in general satisfied with the efficiency of these market segments, there is still some fragmentation on the short-term securities and repo market, the three main categories of this being fiscal differences, differences in technical requirements and market practices, and issues related to the legal environment. The Giovannini group worked on this issue, as it was asked by the European Commission to address the most basic pillar of the infrastructure that supports financial markets in general: the system that ensures that securities exchanged in Europe are properly delivered from the seller to the buyer. In its November 2001 study, the group reported that, relative to domestic transactions, transactions across EU Member States are far more complex as they involve for clearing and settlement purposes different CCPs and Central Security Depositories, which is a source of inefficiency and thus higher costs. Indeed, the need to access many national systems, where differences in technical requirements, market practices, tax regimes and legal systems act as effective barriers, is hindering deeper integration. The group clearly identified 15 different barriers to efficient cross-border clearing and settlements, urging action to remove them in order to create a truly integrated European financial system.

First of all, many barriers are related to technical requirements and market practices, and act as hurdles to cross-border clearing and settlements. A variety of non-standardised platforms for clearing and settlements exist at national level, raising the cost of cross-border clearing and settlement. Restrictions sometimes on the location of clearing and settlement prevent cross-border investors from centralising their activities. Even if remote access to a system located in another Member State is technically possible, it often remains not the best option for investors. Settlement periods (transaction day plus one, two or three days) should be harmonised so as to reduce the need for costly funding arrangements in cross-system transactions. National differences in operating hours and settlement deadlines should disappear, and differences in securities issuance practices should be harmonised. Finally, some restrictions concerning the location of securities and the activity of primary dealers and market makers still exist.

Secondly, several barriers are specifically related to tax. As securities are liable for taxation where they are held, problems can arise due to unfamiliarity with national tax regimes and the risk of double taxation. However, national differences in regimes for withholding tax and capital gains tax are the main source of problems. With regard to withholding tax, foreign intermediaries can be disadvantaged in their capacity to offer at-source relief from withholding tax.

Finally, the third type of barrier relates to the different legal environment across countries and the subsequent legal uncertainty that is created. Differences in the legal treatment of securities are most evident in the context of collateralisation, as collateralised transactions raise the question of the actual ownership of the securities concerned. It should be noted, however, that Directive 2002/47/EC of the European Parliament and of the Council on 6 June 2002 on financial collateral arrangements, which entered into force on 27 June 2002, should contribute to easing this barrier.

Some of the barriers can be addressed by the private sector alone, as market-led convergence in technical requirements and market practices across national systems would improve the clearing and settlement system at the EU level. Any consolidation in the clearing and settlement systems that may result would also lead to greater harmonisation of practices. On the other hand, the removal of taxation or related legal barriers is clearly within the public domain. Finally, on the part of the central bank, two efforts supporting securities clearing and settlement efficiency, and, thus, financial market integration, can be highlighted. First, on 25 September 2001 the ECB published a Eurosystem policy line with regard to consolidation in central counterparty clearing. Second, in October 2001 the ESCB and the Committee of European Securities Regulators set up a framework for co-operation in the field of securities clearing and settlement systems. This process will lead to the establishment of standards and/or recommendations for securities settlement systems and for central counterparties at the European level. Common standards will contribute to creating a level playing field for the providers of securities clearing and settlement services, and to overcoming the distinct heterogeneity of European countries' legislative frameworks.

²³ The consultation procedure was still ongoing when this study was published.

Annex I: Technical annex

Scope of the study

In this third Money Market survey, banks were invited to provide data about their interbank activity during the second quarters of 2001 and 2000, covering the main segments of the euro money markets. Non-interbank or customer transactions (i.e. transactions with corporate customers, central banks or supranational institutions) are not reported as they do not fall within the scope of the study.

Banks reported interbank activity if this activity is booked in their own entity. Intra-group flows derived from intra-group operations are excluded from this study. Any interbank activity from another subsidiary/branch of the group is reported by the relevant entity of the group in a separate questionnaire. The data reported are nominal amounts for cash transactions and notional amounts for derivative transactions. Transactions related to the rollover of previous positions were also taken into consideration. The turnover for each maturity bucket was the "average" daily turnover over the relevant quarter. The "average" daily turnover is calculated on the basis of the total amount of transactions executed during the reporting period, divided by the number of business days in the reporting period. The banks answering the survey were asked to specify the number of business days considered for this calculation. The "average" daily number of transactions is calculated on the basis of the total number of transactions executed during the reporting period, divided by the number of business days in the reporting period.

The turnover was posted in each maturity bucket according to the initial maturity of the transactions (including forward transactions, regardless of the settlement date). In the case of transactions redeemable at notice, the length of the notice has been reported as the maturity. The daily average number of transactions over the second quarter of 2001 was provided for each of the following transaction size brackets in euro nominal amounts: up to 100 million, from 101 to 1,000 million, and above 1,000 million.

As concerns the number of counterparties with which reporting banks have transacted during the second quarter of 2001, these were broken down in terms of geographical location of the counterparty: national, euro area and others. "National" refers to counterparties located in the same country as the reporting bank. If the reporting bank is not located in the euro area, "euro area" refers to counterparties located in the 12 euro area countries; if the reporting bank is located in the euro area, "euro area" refers to counterparties located in the other 11 euro area countries. "Others" refers to counterparties located in all non-euro area countries.

Secured and unsecured markets

For the secured and unsecured segments of the money market, the activity tables are divided in terms of lending and borrowing activity. For the secured market, "Cash lending" refers to buy/sell back transactions and reverse repos, while "Cash borrowing" refers to sell/buy-back transactions and repos. As a percentage

of the average daily transactions on secured markets, the share of variable repos as opposed to fixed rate repos has also been reported. Information about the origin of collateral has been provided as a percentage of the average daily transactions on secured markets. The country of issuance of the security used as collateral follows the same geographical approach as used for the location of counterparties: national, euro area and others.

Swap markets

Different kinds of swap transactions are covered by this study.

- Overnight Index Swaps are financial operations involving an exchange of cash flows on a specified date. They involve either paying or receiving a fixed cash flow or paying or receiving a variable rate cash flow. In the euro money markets, EONIA is the most widely recognised overnight index. Banks were asked to provide the average daily turnover of OIS transactions that are not indexed to EONIA as a percentage.
- Foreign exchange swaps are transactions which involve the actual exchange of two currencies (principal amount only) on a specific date at a rate agreed at the time of conclusion of the contract (the short leg), and a reverse exchange of the same two currencies at a future date at a rate (generally different from the rate applied to the short leg) agreed at the time of the contract (the long leg). Both spot/forward and forward/forward swaps fall into this category. Banks have only reported FX swaps if one of the two currencies exchanged is the euro and the short leg in euro for FX swaps should be reported.
- Interest Rate Swaps are agreements to exchange periodic payments related to interest rates in one currency, here the euro; they can be fixed for floating or floating for floating, based on different indices.
- Cross-Currency Swaps are contracts that commit two counterparties to exchange streams of interest payments in different currencies for an agreed period of time and to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity. Banks were asked to consider cross-currency swaps only if one of the currencies involved was the euro.

Short-term securities

Information on the turnover on outright transactions on euro-denominated short-term securities is divided into 3 categories: government issues (e.g. T-Bills), bank issues (i.e. paper issued by euro area credit institutions) and non-bank issues (i.e. paper issued by corporates). Banks report the daily outright transactions average. Outright transactions are defined as a sale or purchase of short-term securities on the interbank secondary market. The primary market or issuance activity has not been included. Short-term securities are defined in a broad way as all securities with an initial maturity of up to 12 months, including T-Bills, CPs ECPs, ABCPs, CDs, etc.

Annex 2: Glossary

Alternative trading systems (ATSs): systems that offer additional means of trading compared to established exchanges. They operate electronically (lowering transaction costs) and focus on services that established exchanges do not always provide (e.g. central limit order book, after-hours trading or direct access for institutional investors).

Arbitrage: profiting from differences in price when the same security, currency or commodity is traded on two or more markets.

Asset allocation: the process of deciding in which assets to make investments and what proportion of total capital available should be allocated to each choice.

Asset-backed commercial paper (ABCP): commercial paper (CP) backed by a form of collateral provided by the issuer.

Bank certificates of deposit (CDs): short-term securities issued by banks.

Bid-ask spread: differential prevailing on the market between the bid price and the offered price.

BIS: Bank for International Settlements.

Broker: a firm which operates on a market on behalf of other participants to arrange transactions without being a party to the transactions itself.

Bubill: German Treasury bill.

Central counterparty (CCP): an intermediary which takes over the obligation of either side in respect of a trade. After clearing with a central counterparty, the two trading parties no longer have an obligation towards each other, but rather towards the central counterparty, which thereby assumes any replacement cost risk resulting from market moves between the time of trade and the time of settlement.

Central securities depository (CSD): a facility for holding securities which enables securities transactions to be processed by book entry. Physical securities may be immobilised by the depository or securities may be dematerialised (i.e. so that they exist only as electronic records). In addition to safekeeping, a central securities depository may incorporate comparison, clearing and settlement functions.

Clearing: the process of transmitting, reconciling and, in some cases, confirming the payment order and the securities transfer prior to settlement. In the context of repos, this can have three separate aspects: confirmation/matching, netting and clearing with the central counterparty.

Commercial paper (CP): short-term obligations with maturities ranging from 2 to 270 days issued by banks, corporations and other borrowers. Such instruments are unsecured and usually discounted, although some are interest-bearing.

Counterparty: the opposite party to a financial transaction.

Credit risk: the risk that a counterparty will not settle an obligation at full value, either when due or at any time thereafter.

Currency risk: the risk that the operations of a business or the value of an investment will be affected by changes in exchange rates.

Dealer: a firm whose primary business is entering into transactions on both sides of wholesale financial markets and seeking profits by taking risks on these markets.

Depository: an agent with the primary role of recording securities either physically or electronically and keeping records of ownership for these securities.

Derivative: a financial contract, the value of which depends on the value of one or more underlying reference assets, rates or indices. For analytical purposes, all derivatives contracts can be divided into basic building blocks of forward contracts, options or combinations thereof.

ECP: the Euro Commercial Paper market, on which the major dealers are international, mostly London-based, banks.

Electronic trading: in broad terms, this refers to any use of an electronic means of sending orders (bids and offers) to the market.

Eurex: German/Swiss futures and options exchange market.

EURIBOR: the euro area interbank-offered rate for the euro, sponsored by the European Banking Federation (EBF) and the Association Cambiste Internationale (ACI). It is an index price source covering dealings from 49 prime banks²⁴.

Euro overnight index average (EONIA): the overnight rate computed as the euro area interbank offered overnight rate for the euro. It is computed as a weighted average of all overnight unsecured lending transactions on the interbank market, initiated within the euro area by the contributing panel of 49 prime banks²⁵.

Euronext: company born out of the merger of the Amsterdam, Brussels and Paris exchanges on 22 September 2000.

European Master Agreement: legal contract sponsored by the European Banking and the European Savings Association, which aims to consolidate into a single set of harmonised documents various master agreements used within the euro area and certain neighbouring countries, particularly for repurchase transactions and securities lending.

European System of Central Banks (ESCB): the European Central Bank and the national central banks of the EU Member States.

Eurosystem: the European Central Bank and the national central banks of the EU Member States which have adopted the euro.

Foreign currency swap: an agreement between two parties to exchange future payments in one currency for payment in another currency. These agreements are used to transform the currency denomination of assets or liabilities.

Forward rate agreement (FRA): cash-settled forward contract on a deposit.

Forwards: purchase or sale of a specific quantity of a commodity at the current price, with delivery and settlement at a specified future date.

Futures: agreement to buy or sell a specific amount of a commodity or financial instrument at a particular price on a stipulated future date.

General collateral: collateral which, owing to its homogeneous features, is broadly accepted.

Interest rate swap (IRS): exchange between two parties of a fixed interest rate instrument or of two floating interest rate instruments.

Investment services directive (ISD): this refers to the Council Directive 93/22/EEC of 10 May 1993 on the provision of investment services in the securities field. One of the main achievements of the ISD has been to provide a single European passport for investment firms by allowing them to provide services, or establish branches in other Member States, on the basis of home country authorisation. As a corollary, the ISD has introduced the right of investment firms to become a member or to have access to regulated markets of another Member State either with a presence in that State or by remote membership.

²⁴ *Number of panel banks as of August 2002.*

²⁵ *Ibid.*

International central securities depository (ICSD): a central securities depository which clears and settles international securities or cross-border transactions in domestic securities.

LIFFE: London International Financial Futures and Options Exchange.

Liquid (market): three aspects of liquidity are tightness in bid-ask spreads, depth and resiliency. It is characterised by the ability to transact in a market without significantly moving prices.

Market capitalisation: the value of a corporation as determined by the market price of its issued and outstanding common stock.

Market maker: a dealer obliged to quote buy and sell prices in return for certain privileges within a market (sometimes used to refer to any institution which provides quotes).

Market transparency: the ability of market participants to observe (pre-trade) quotes, (post-trade) prices and volumes in a timely fashion.

Monetary Financial Institutions (MFIs): financial institutions which form the money-issuing sector of the euro area. These include the Eurosystem, resident credit institutions as defined in Community law and all other resident financial institutions whose business is to receive deposits and/or close substitutes for deposits from entities other than MFIs and, on their own account (at least in economic terms), to grant credit and/or invest in securities. The latter group consists predominantly of money market funds.

Online: in electronic money systems, this indicates that a direct connection is made to a centralised computer system for authorisation or validation before a transaction can be executed.

Open interest: total number of contracts in a commodity or options market that are still open; that is, have not been exercised, closed out, or allowed to expire.

Options: the right to sell or buy a security in exchange for an agreed sum.

OTC (over-the-counter): bilateral transactions not conducted on a formal exchange.

Primary dealer: a selected credit institution authorised to buy and sell original issuance of government securities dealing directly with the Treasury.

Primary market: market for new issues of securities.

Real-time gross settlement (RTGS) system: a settlement system in which processing and settlement take place on an order-by-order basis (without netting) in real time (continuously).

Remote access: access to a system granted to a participant which has neither its head office nor any of its branches located in the country where the system is based.

Repo: financial instrument which serves to exchange cash temporarily for securities for a predetermined period. Various legal arrangements exist to perform this basic economic function (repurchase agreements, reverse repurchase agreements, sell/buybacks and securities lending). All forms of repos entail a change in ownership.

Reserve maintenance period: the period over which compliance with reserve requirements is calculated. For the Eurosystem, this is one month, starting on the 24th calendar day of each month and ending on the 23rd calendar day of the following month.

Reserve requirement: requirement for institutions to hold minimum reserves with the central bank.

Screen-based trading: trading conducted through a network of electronic terminals.

Secondary market: exchanges and over-the-counter markets where securities are bought and sold subsequent to the original issuance, which took place on the primary market.

Settlement: completion of a transaction by the exchange of instruments and funds.

Small capitalisations: small cap stocks usually have a market capitalisation equivalent to USD 500 million

or less.

Special collateral: collateral other than general collateral.

Straight-through processing (STP): the capture of trade details directly from front office systems to back office.

Swap: an agreement for an exchange of payments between two counterparties at some point(s) in the future and according to a specified formula.

TARGET (Trans-European Automated Real-time Gross settlement Express Transfer system): TARGET is the RTGS payment system for the euro. It consists of 15 national RTGS systems and the ECB payment mechanism, which are interlinked so as to provide a uniform platform for the processing of cross-border payments.

Tier one assets: marketable assets fulfilling certain uniform euro area-wide eligibility criteria specified by the ECB. Among these criteria are the requirements that they must be denominated in euro, be issued (or guaranteed) by entities located in EEA countries, and be located in a national central bank or SSS of the euro area.

Tier two assets: marketable or non-marketable assets for which specific eligibility criteria are established by the national central banks, subject to ECB approval.

Treasury bill (T-Bill): short-term government debt instrument issued at a discount with a maturity of one year or less.

Treaty: the Treaty establishing the European Community. It comprises the original EEC Treaty (Treaty of Rome) as amended by the Treaty on European Union (signed in Maastricht on 7 February 1992).

UCITS: undertakings for collective investment in transferable securities.

Annex 3: Comparison (methodology and coverage) between the BIS triennial Central Bank Survey of Foreign Exchange and Derivatives market activity (turnover part) and the MOC Money Market Study

	BIS	This money market study
reporting basis	Location of trade	idem
instrument coverage	Foreign exchange transactions (forwards and FX swaps, XCCY swaps, currency options) and single currency interest rate derivatives (IRS, FRAs, options) involving all currencies	OIS and IRS in Euro, XCCY and FX swaps involving the euro on one side of the transaction
frequency	triennial	annual
reporting period	turnover in nominal and notional amounts during April 2001	turnover in nominal or notional amounts during Q2 2001 (2000)
data sources	reporting banks via 48 central banks and international institutions	reporting banks via the ESCB
elimination of double counting	yes	no
maturity breakdown	for outright and foreign exchange swaps, the following bands: -7 days or less -over 7 days and up to 1 year -over 1 year	for all derivatives instruments -up to 1 month -1 month to 3 months -more than 1 year

Annex 4: Lessons from 11 September 2001

• The euro money market and euro-dollar liquidity

In the aftermath of the terrorist attacks on the US, euro area banks faced financing difficulties in their US dollar and to a lesser extent in their euro positions.

The overnight rate rose significantly, at times even above the rate of the marginal lending facility, with the tensions in the euro money market mainly an indirect effect of the more critical situation in the dollar market. The steep increase in the overnight rate on 12 September started to decline somewhat around 9:00 a.m., after the market had fully reacted to the ECB's press communication, stating that the Eurosystem would provide liquidity to the markets if need be. The ECB then launched a liquidity-providing fine-tuning operation to ease tension. A first quick tender at a fixed rate of 4.25% and one-day maturity was launched on 12 September, through which the ECB satisfied all submitted bids, totalling EUR 69.3 billion. A similar operation was conducted on 13 September totalling EUR 40.5 billion. Over the following week, the overnight cash market operated more normally with no need for the ECB to provide further overnight facilities. The two liquidity-providing fine-tuning operations therefore successfully eased euro money market tensions very quickly.

Of greater concern was the fact that euro area banks rapidly experienced difficulties in raising short-term USD financing to cover their USD positions. Those difficulties arose as US banks were reluctant to lend USD before they were certain of their own liquidity needs, well after the end of the European trading session. Moreover, some euro area banks with US banking licences, although having enough collateral to use at the FRBNY's discount window facility, encountered difficulties in raising this emergency money because their custodians in New York were unable to deliver this collateral to the FRBNY. Ahead of such tensions, the ECB announced to the market that it had signed a swap agreement with the Federal Reserve Board of New York for an outstanding amount of USD 50 billion in order to provide USD to the market against euros. This agreement, which was first activated in the evening of 12 September, functioned in the following way: euro area counterparties had to request USD financing from their respective NCB, then the ECB communicated to the FRBNY the requested amount of USD to be swapped against euros and then, finally, the dollars were provided to the market by the NCBs.²⁶

Overall, the provision of emergency liquidity following the terrorist attack was successful and the market was also pleased that the Eurosystem had helped euro area banks to meet urgent US dollar liquidity needs. In general, the crisis also brought to the fore the following points:

- the importance of central bank liquidity,

²⁶ Thereafter, the Bank of England and the Bank of Canada proceeded in the same way, respectively releasing \$30 billion and \$10 billion, while a number of other central banks announced that they would provide, if necessary, US dollar liquidity by using their foreign exchange reserves.

- the effectiveness of the Eurosystem liquidity management framework in periods of stress and, specifically, of the liquidity-providing fine-tuning operations,
- the proper functioning of the euro money market, with recourse to standing facilities remaining very small, and
- international co-operation and contacts between central banks, which facilitated management of the crisis.

- **Disturbance on the bond markets**

For market participants located in New York, activity in wholesale financial markets was greatly reduced for several days. Dealing in many US dollar debt products continued in other centres (including London and Frankfurt) but generally on a 'best efforts' basis only and for extended settlement. Some banks' operations in Europe were disrupted, for example by precautionary evacuations of their premises. Market participants reported that their clients were concerned during this period about settlement and liquidity issues with respect to dollar products. Prices adjusted in response to the events, but transaction volumes remained low, and an accurate price discovery was not possible on many markets. Once trading resumed in the US, volumes and liquidity tended to improve day by day across markets. However, bid-offer spreads on US debt markets remained higher than normal for several days, particularly for off-the-run issues. US repo markets took the longest to return to normal: market functioning was impaired by a shortage of general collateral, and failed trades associated with a large custodian. The dislocation in the US Treasury repo market was substantially eased by a special \$6 billion reopening of the on-the-run Treasury note on 2 October.

As far as the European government bonds market was concerned, most European market makers continued to make two-way quotes for European government bonds, but at wider than normal spreads, particularly for non-benchmark issues. Corporate bond spreads over government debt, which had already widened following credit downgrades in the telecommunications sector prior to the attack, recorded a further deterioration.

With regard to electronic trading, an immediate widening of quoting spreads was observed, followed soon afterwards by the suspension of quotation by market makers. Trading resumed the day after the terrorist attacks, accompanied by exceptional softening measures: the standard dealing quota was reduced from EUR 10 million to EUR 5 million; an enlargement of the quotation spread was authorised; and obligations to quote non-benchmark bonds were suspended. Overall, it took more than a week for volumes usually dealt on electronic platforms to be restored. This episode revealed that in such a crisis context, traditional desks in banks and direct trading helped to alleviate the impact of the crisis situation.

Annex 5: Electronic platforms

Box 5

BrokerTec Repo

In December 2000, BrokerTec Europe launched its Repo platform in European Government bonds.²⁷ Its market share had reached over EUR 20 billion per day by April 2001, increasing to EUR 30 billion by July 2001 (and to over EUR 70 billion by April 2002) (all single-count nominal volumes). The system is used by over 40 major players on the interbank market. It is a high-speed system, with high levels of straight-through processing, and an open architecture which allows interfacing between the BrokerTec system and participants' own internal networks. The special functionality includes centrally defined standard repo terms, 'tailor-made' repo, allowing traders to create their own start and end dates, and automatic pricing of collateral. BrokerTec's GC functionality includes the first electronic 'GC allocator' that enables participants to electronically allocate collateral to repo trades from a pre-defined list. BrokerTec is the first electronic platform to offer rights of substitution on GC repo trades of up to one year.

The main specifications of BrokerTec Repo are as follows:

- Trading Hours: 6.45 a.m. to 5 p.m. London time.
- Terms: 1–365 days (ability to trade forward as well – only place to trade LCH's Forward Start GC instrument that delays collateral allocation until start date).
- Contract size: EUR 1 million for special collateral repo, EUR 25 million for general collateral repo.
- Contract specifications: Anonymous trading via CCP with a reduction in credit lines, balance sheet and settlement netting for German Government Bonds, Belgian Government Bonds, Dutch Government Bonds, Austrian Government Bonds, Jumbo Pfandbriefe, Supranationals, Sovereigns & Agencies, Finnish Government Bonds, Irish Government Bonds, French Government Bonds (Fixed rate and EONIA linked), and French Agencies. Bilateral trading (i.e. name give-up after execution): Italy, Spain, Greece, UK Gilts (including a DBV facility). Market concept: if a trader accepts a trade from another, the trade is generated. Where a central clearing counterparty operates on that market, they assume the obligation to fulfil all transactions.

²⁷ The BrokerTec platform was launched in July 2000 by 14 of the largest European and US fixed-income securities companies to provide fast, reliable and cost-effective execution as well as straight-through processing in the US & European cash and repo fixed-income markets.

EuroMTS (MTS repo facility)

EuroMTS Limited is a private company, incorporated in the UK and subject to FSA supervision, which manages the pan-European electronic trading system for euro-denominated benchmark bonds. Shares of the company are wholly owned by the Italian company MTS SpA (founded in 1988), which manages the wholesale regulated market for government securities.

Since its foundation in 1999, EuroMTS has offered a Repo Trading Facility (RTF). All securities traded on EuroMTS and on national MTS structures can be the object of repurchase agreements: the Italian repo falls under the management of MTS Spa, whereas all other repo segments are managed by EuroMTS.

Two types of contracts can be negotiated on the Telematico system (MTS architecture system): special and general collateral repos.

The main specifications of EuroMTS are as follows:

- Trading hours: 9.00 a.m. to 7.00 p.m. CET.
- Participants: 237.
- Contract size: EUR 500,000 for both special and general collateral repo.
- Volumes: total volume in 2001 reached EUR 7.05 trillion, i.e. EUR 28 billion daily volume. A new record daily volume of EUR 40 billion was registered in February 2002.
- Contract specification: currently the Repo Trading Facility allows both non-anonymous and anonymous trading through the central counterparty (CCP), which can be either London Clearing House or Clearnet, depending on the type of product. RTF members that are LCH members can trade Austrian, Belgian, Finnish, Dutch, German, Portuguese government securities, Pfandbriefe and quasi-government securities anonymously, while RTF participants that are Clearnet members can trade French government bonds anonymously.

EurexRepo

Since July 2001, the international exchange organisation Eurex has offered a euro segment on its electronic repo market¹⁾. Based on internet technology, EurexRepo provides an integrated trading and clearing platform for (general or special) repo transactions with German government bonds or Jumbo Pfandbrief issues. EurexRepo offers trading through clearing and settlement, and an integrated trading and clearing procedure under one roof, allowing risk-efficient cross-product netting. One of the main components of euro repo trading is overnight business with a term of one trading day, which Eurex was the first to offer on an electronic repo market. The main specifications are:

- Trading hours: 07.30 a.m. to 06.00 p.m. CET.
- Terms: 1-365 days.
- Contract size: EUR 1 million for both general collateral and special collateral repo.
- Contract specifications:
 - German GC based: German government bonds or bonds from the Treuhandanstalt
 - German Jumbo basket: Jumbo Pfandbrief issued by a German institution with a minimum issuance volume of EUR 1 billion and a credit rating of AA and better.
- Market concept: if a bank accepts a quote from another, then the trade is generated. Eurex Clearing AG functions as the central counterparty for the buyer and the seller, thus assuming the obligation to fulfil all transactions.
- Risk management:
 - Daily profit and loss statements;
 - Automated margin calculation;
 - Cross-margining with different Eurex product types is possible;
 - A collateral pool is used for all Eurex products and markets (cross-collateralisation)

1) The Eurex repo trading platform was launched in June 1999 to initiate electronic repo trading in Switzerland.

Annex 6: Co-ordination of the study

The study of the Market Operations Committee of the ESCB was conducted by a working group involving representatives from the ECB and from NCBs and was chaired by Mr. Paul Mercier of the ECB. The members of the working group were: Norbert Vandecan (National Bank of Belgium), Theo Wassner (Deutsche Bundesbank), Etienne Port (European Central Bank), Stephanie Lange (Banque de France), and Simon Ainsworth (Bank of England).