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EUROPEAN CENTRAL BANK

REVIEW OF THE INTERNATIONAL ROLE OF THE EURO December 2002

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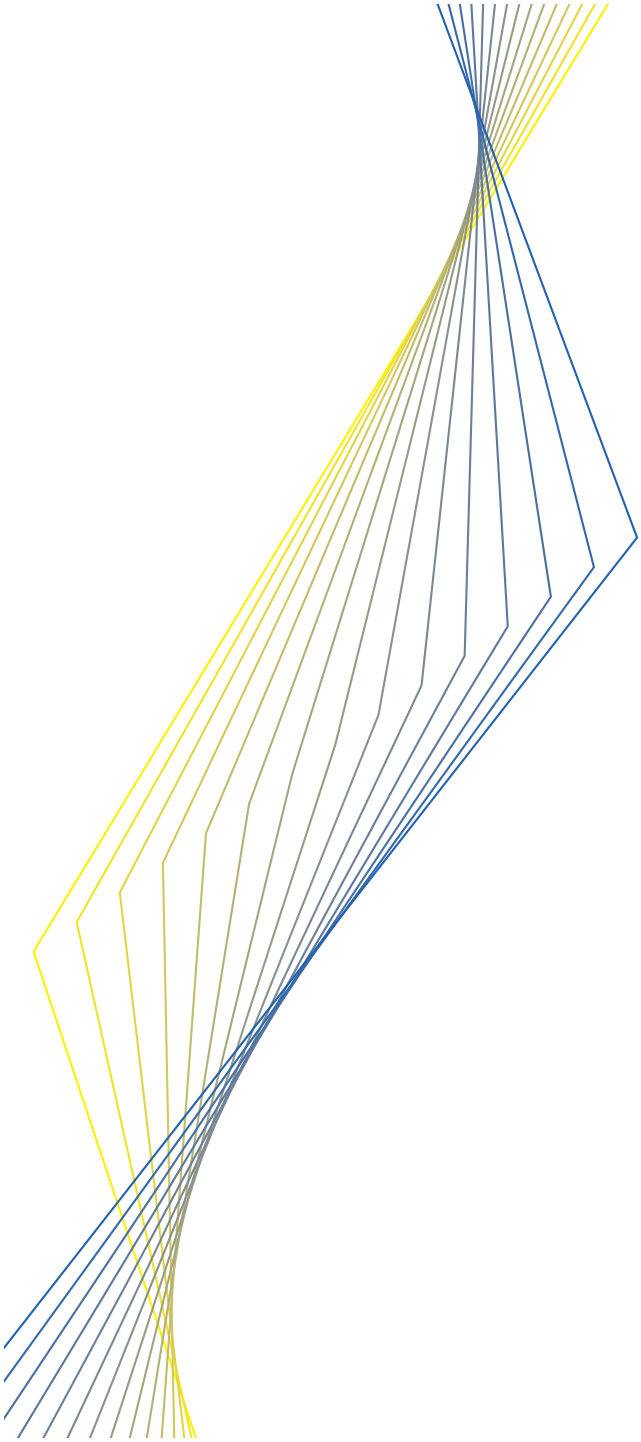

REVIEW OF THE INTERNATIONAL ROLE OF THE EURO

December 2002

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As at October 2002.

ISSN 1725-2210

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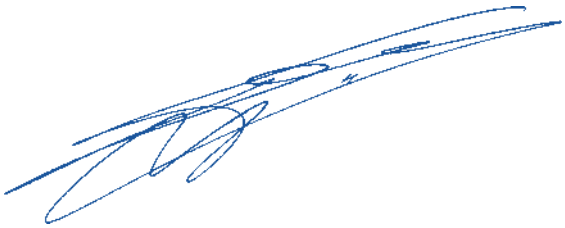
Foreword

The euro, the single currency of the euro area, also plays a significant role in financial markets and third countries outside this area. Part of this international role has been inherited from the euro's legacy currencies, in particular the Deutsche Mark. However, the advent of European Economic and Monetary Union (EMU) has given the international role of the euro a new impetus, compared to that of its legacy currencies, through the creation of a single large economic entity and the integration of its domestic financial markets. This report – focusing on developments in 2001 and the first half of 2002 – offers new evidence that the international role of the euro has grown, although gradually, since the launch of the third stage of EMU on 1999.

The report reflects the ongoing efforts of the ECB to monitor and analyse the international role of the euro. In doing so, it not only provides information on the international use of the currency, i.e. its use by market participants and authorities outside the euro area, but also sheds some light on ongoing structural developments in the international financial system, financial markets and third countries' policies.

It is in the international debt securities markets that the international role of the euro has grown most noticeably. The report finds that this has been the result of a growing supply of euro-denominated securities issued by internationally active corporations, coupled with ongoing demand for international euro-denominated assets by euro area residents.

The ECB intends to continue its monitoring of the international role of the euro and to provide regular information to the public on related developments in the international financial arena.



Willem F. Duisenberg
President of the European Central Bank

Executive summary

1. This is the 2002 review of the international role of the euro. It examines the role of the euro in global markets and countries outside the euro area and aims to enhance the Eurosystem's understanding of the current state of the internationalisation of the euro and to identify the main developments and underlying trends.

2. This year's review also reflects a further development of the analytical apparatus and statistical coverage with regard to the euro's international role. Accordingly, it contains a number of new results and datasets:

   (i) for the international debt markets, data are now included on: the regional and sectoral breakdowns of international issuers of euro-denominated bonds; some features of the largest bond issues; the role of the euro in emerging market issues and benchmarks; the share of the euro in bond portfolios outside the euro area; the role of the euro in the City of London; and the currency breakdown of the international investment position of selected euro area countries.

   (ii) with regard to foreign exchange markets, the review integrates the recent BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity (hereafter referred to as the Triennial survey) and some new research findings on developments in EUR/USD spreads and EUR/JPY liquidity.

   (iii) in the area of international trade, the review now includes the currency breakdown of the external trade of selected euro area countries and new data available from Japan on the currency breakdown of its trade with the European Union.

   (iv) on the use of the euro in third countries, the review has been enriched with data on the currency composition of foreign exchange reserves in selected countries. Moreover, it includes information on the role of the euro as a parallel currency in certain countries outside the euro area, compiled in the context of the 2002 euro cash changeover.

3. To integrate these new datasets and to focus more directly on the environment in which the euro's international role is developing, the structure of the review has been slightly modified to deal with the role of the euro, first, in global markets (including capital markets, foreign exchange markets and international markets for trade in goods and services) and, second, in third countries, as an anchor, reserve, intervention or parallel currency.

4. The review period extends from the beginning of 2001 to mid-2002.

The main findings of the review can be summarised as follows:

International debt markets

5. The international role of the euro has continued to grow gradually, with the share of euro-denominated international debt securities issued by non-residents increasing by 3 percentage points over the review period to 29%. This compares with a share of 44% for the US dollar and 13% for the Japanese yen. However, evidence presented in this review indicates that the role of the euro seems to be developing certain particular features. First, all available data point to an increasing share of the euro in the supply of international bonds and a flat – or even slightly receding – demand

for such securities outside the euro area. This suggests that a significant and increasing share of international bond issues is being absorbed by euro area investors. Second, non-resident issuers are concentrated in a few industrialised economies (especially the United States and the United Kingdom), while emerging market economies make only limited use of the euro, with the exception of those which are geographically close to the European Union. Third, on the demand side the share of euro-denominated bonds in portfolios directly managed by US financial institutions is close to zero. By contrast, this share seems to be significant in non-euro area European economies at around 30%. In particular, the role of the City of London is prominent, where more than half the over-the-counter activity in secondary markets for international bonds is in euro-denominated securities. Fourth, comparing for every currency the international issuance with total issuance (the latter comprising domestic and international issuance), the share of international debt securities is the highest for the euro: debt securities issued in euro by non-residents account for 11% of the global euro-denominated debt securities market, while the corresponding share for the US dollar is 9% and for the yen 6%.

Foreign exchange markets

6. The euro's role in the foreign exchange markets is broadly similar to that of the Deutsche Mark in the past. About one-fifth of global spot trading in 2001 involved the euro, which corresponds to the share of the Deutsche Mark in 1998. However, one important piece of evidence suggests the decrease of the euro's share in swap trading, possibly linked to the "arithmetic" elimination of swaps involving legacy currencies and the end of "EMU convergence trading". The US dollar remains the global vehicle currency for transactions between almost all currency pairs, with the exception of some Nordic and eastern European currencies, where the euro appears to be playing this role. Quite surprisingly, spreads in USD/EUR quotations exceed those previously existing between the Deutsche Mark and the US dollar. Different views exist as to whether this reflects a decline in market efficiency or is the result of quoting conventions. The review offers evidence in favour of the second view. Finally, evidence is found that liquidity in the EUR/JPY market, which had earlier dropped below DEM/JPY levels, has started to recover.

International trade

7. Data on the currency breakdown of international trade transactions remain highly limited. Available data from euro area countries show a significant rise in the use of the euro for goods and services trade with countries outside the euro area, both for imports and exports, and suggest that about half the euro area's external trade may be conducted using the euro. Available data for EU trade with Japan confirm that the euro's role has increased, as the share of the euro in EU imports from Japan rose from 40% to 52% over the review period, and its share in EU exports to Japan increased from 18% to 29%.

Third countries

8. The role of the euro in third countries outside the euro area has remained stable, as changes in countries' anchor, reserve and intervention currencies typically evolve only very gradually. In this context, the euro's role is most prominent in countries geographically close to the euro area. Roughly 50 countries include the euro in their exchange rate policies as an anchor or reference currency (the bulk of them

located in Europe or nearby regions), but most of these are relatively small economies, together accounting for only 4% of world GDP. The share of the euro in international foreign exchange reserves has also remained stable, at around 13% of global official reserves, according to IMF (International Monetary Fund) data for 2001. This may be surprising given that certain industrialised countries, which publish their reserve currency breakdowns, show a rise in the share of the euro and some Asian emerging market economies have also announced plans to hold a greater proportion of their reserves in euro.

9. Data collected in the context of the euro cash changeover have presented an opportunity to gauge the amount of euro cash in circulation abroad and provide some information on the use of the euro as a parallel currency in certain countries neighbouring the European Union. Overall, findings have confirmed that the euro has smoothly replaced legacy currencies, in particular the Deutsche Mark, as earlier holdings have either been exchanged for euro cash or deposited as euro-denominated bank deposits. Some evidence, albeit inconclusive, suggests that the euro's cash circulation outside the euro area could be in the region of around €20 to 25 billion, amounting to about 8% of total euro cash circulation. Moreover, it is interesting to note that in the run-up to the cash changeover, the value of euro-denominated bank deposits in countries neighbouring the European Union increased from €39 billion to €52 billion, as many economic agents transformed legacy cash holdings into such deposits.

Policy issues

10. The European Central Bank (ECB) does not pursue the internationalisation of the euro as an independent policy goal, which implies that it neither fosters nor hinders this process. Rather, it accepts the international role of the euro, as well as that of other key currencies, as being mainly determined by the decisions of market participants in a context of increasing market integration and liberalisation at the international level. Nevertheless, the ECB is interested in monitoring the international role of the euro as it reflects global market and policy developments. Moreover, this role may also affect the economic environment in which monetary policy operates. In this respect, the ECB's monetary policy strategy is sufficiently flexible to cope with the effects related to the international use of the euro.

Conclusions

11. Even though the euro only has a short history, a few specific features can already be identified as characteristic of its international role. First, the start of Monetary Union on 1 January 1999 indeed appears to have represented a structural break between the international use of the legacy currencies in several global market segments and that of the euro. This is particularly relevant with regard to the impulse that the introduction of the euro has given to international debt issuance by creating a unified and thus larger market. While this momentum has led to an increase in the international role of the euro, this role is, however, developing only gradually. Second, the international role of the euro appears to a considerable extent to be driven by demand from investors within the euro area. As this review shows, euro area residents have purchased a significant share of euro-denominated bonds issued outside the euro area. Third, the international role of the euro has a strong regional dimension, as it is focused on countries and financial centres geographically close to the euro area.

Introduction

Significant use is being made of the euro internationally by residents of countries outside the euro area. It is used as the currency of denomination for various financial assets and liabilities outside the euro area, as an anchor, reserve or intervention currency by authorities in several third countries, and as a parallel currency by private agents in a few countries neighbouring the euro area. It is also used for invoicing in some areas of international trade and as a vehicle currency in some segments of the global foreign exchange market.

The euro inherited an international role from some of its legacy currencies, especially the Deutsche Mark; since then, this role has been further shaped by recent market developments, the assessments of private agents both inside and outside the euro area and policies of third countries. Overall, in most areas usually considered relevant in determining the international role of currencies, the euro ranks second behind the US dollar and ahead of the Japanese yen in terms of market share and thus plays a considerable role in the international arena. This review, which covers the period extending from the beginning of 2001 to mid-2002, therefore takes stock of the information available on the international role of the euro and analyses changes and structural developments from the perspective of the global markets, third countries and the euro area itself. A fact sheet with the key data is annexed to the report.

Compared with last year's review,[1] the report takes account of several new sets of data that have become available (e.g. on the use of the euro as a parallel currency in third countries). It also considers recent research findings, including work on the roles and features of key currencies in the foreign exchange markets. Additional information on securities market structures is provided by commercial data providers (such as Bondware, Capital Access International and International Financing Review).

The structure of the review is as follows. Section A covers topics where global markets constitute the environment for the determination of the role of the euro as an international currency. It focuses on international debt markets, foreign exchange markets and international markets for trade in goods and services. Section B turns to the role of the euro in third countries, focusing first on authorities' choice of the euro as anchor, reserve or intervention currency in their exchange rate policies and, second, on the choice of private agents to use the euro as a parallel currency, in the form of cash holdings or foreign currency deposits. Section C highlights some structural differences between the international role of the euro and that of the other main international currencies, and Section D comments on some potential implications for monetary policy.

1 *European Central Bank (2001).*

A. The euro in global markets

1 The euro in international debt markets[2]

This section reviews the role of the euro in international debt markets, which comprise both instruments with long-term maturities (bonds and notes) and short-term maturities (money market instruments).[3] Developments related to non-securitised instruments (within international bank assets and liabilities) are also briefly considered. In order to structure the presentation, the supply side and the demand side of the markets are analysed separately, with Sub-section 1.1 focusing on the use that issuers in debt markets make of the euro and Sub-section 1.2 considering the use of the euro by security holders.

The supply of international debt instruments is analysed at three levels: (i) the global level, which includes for all currencies both the supply in the domestic market and the supply in the international market; (ii) the so-called "broad" definition of international securities, which comprises issues by non-residents of the respective currency area plus domestic issues targeted at the international financial market; and (iii) the so-called "narrow" definition of international securities, which comprises only issues by non-residents of each currency area (see Box 1 for further details). For the purpose of this review, both the broad and the narrow concepts of international securities are useful as they

2 *The review focuses on international debt markets, as statistical coverage of international equities is more limited (see also BIS, 1997, p. 23). Moreover, international debt encompasses both international debt securities and, less relevant, non-securitised international bank liabilities denominated in euro.*

3 *Bonds and notes have an original maturity of more than one year, while money market instruments have a maturity of up to one year.*

Box 1

Technical aspects related to the debt securities data

A distinction is made between a "narrow" and a "broad" measure of international debt securities (i.e. bonds and notes, as well as money market instruments).[1] The *narrow* measure focuses only on issuance in a currency different from the currency of the country in which the borrower resides. As such, the narrow measure highlights the international financing role of a currency in a strict sense. The *broad* measure adds to the narrow definition the issuance of debt securities denominated in the home currency of the borrower, provided that this issuance is targeted at the international financial market.[2] The *global* measure of debt securities adds to the broad measure all domestic issues targeted at the domestic market. It is a measure of the total supply in the world of debt securities denominated in a given currency, be it domestic or international.

Furthermore, to compare data before and after the introduction of the euro, it is not sufficient to add up all international assets and liabilities denominated in euro legacy currencies prior to 1999. For instance, debt securities previously considered international because placed with euro area investors now have to be classified as a domestic issue. This calls for a reclassification of data, i.e. for an "arithmetic" EMU adjustment. In this review, all euro figures before 1999 are adjusted to allow a direct comparison with the post-1999 figures.

Finally, unless specified otherwise, currency shares concerning debt securities issues are derived at current exchange rates (flow data), while the amounts outstanding (stock data) are calculated at constant 1994 Q1 exchange rates.[3] Although correcting for exchange rate valuation effects may imply some imprecision, for the stock variables the currency valuation effect has been deemed too important to be neglected, as most stock variables cannot be easily adjusted by market participants in the face of exchange rate movements.

1 *For details of the methodology used in this section, see Detken and Hartmann (2000).*

2 *At least one of the following three conditions must be fulfilled. The issue must: (i) be targeted at international investors; (ii) take place through an issuing syndicate where at least one foreign financial institution is involved; and/or (iii) not be regulated by a domestic set of laws.*

3 *The first quarter of 1994 is chosen as the base period as it is the beginning of the data sample. Further checks showed that exchange rates for USD/ECU and JPY/USD in the first quarter of 1994 differ only marginally from the sample average.*

provide alternative perspectives on the international role of the euro: the broad measure is the most frequently used in the literature as a concept for the international use of a currency (and is officially provided by the Bank for International Settlements – BIS) as it gives the full amount of securities available to a *non-resident investor*; the narrow concept computed by the ECB on the basis of BIS data, in contrast, focuses on *non-resident issuers*. Hence, neither of the concepts as such can be taken as a "better" measure of the international role of the euro, but rather the appropriate concept depends on the underlying angle of consideration.

The demand for international debt instruments is analysed at two levels: (i) the demand from non-euro area residents for euro-denominated debt securities (including euro area issues); and (ii) the demand from euro area residents for euro-denominated debt securities issued outside the euro area.

After reviewing the international debt securities markets, this section tries to shed some further light on the use of the euro by considering in Sub-section 1.3 two specific sub-sets of the euro-denominated international debt securities market, namely: (i) the largest issues over the review period, which also account for a large share of the market; and (ii) the issues from emerging markets neighbouring the euro area, which is the only region outside the euro area where the euro is the dominant international financing currency.

1.1 The supply side

The global debt securities market

The share of the euro in the entire global debt securities market – i.e. comprising both domestic and international issues – reported by the BIS stood at 24% in the first quarter of 2002 (Table A.1). The euro is therefore the second-largest currency of denomination in the world supply of debt securities, behind the US dollar with 46%, and ahead of the Japanese yen with 19%.[4] By far the largest part of the global stock of debt securities in all currencies, which is estimated at some USD 38,600 billion at the end of the first quarter of 2002,[5] is accounted for by domestic issues such as US Treasuries, German Bunds, and Japanese government bonds (JGBs). Taking out these purely domestic issues, the international debt securities market under the broad definition amounts to about USD 7,800

4 *These shares are calculated at constant exchange rates; the corresponding shares at current exchange rates are respectively 20%, 50% and 17%.*

5 *At the time of writing, the value of the global stock for the second quarter of 2002 was not available.*

Table A.1

Shares of the major currencies in debt securities supply

Supply segment	Period	Outstanding (USD billions)	Of which [1]			
			Euro	US dollar	Japanese yen	Other
Global supply *(all debt securities issued in the world)*	2002 Q1	38,583	24.1	45.6	18.8	11.5
	2002 Q2	-	-	-	-	-
International supply						
– Broadly defined *(debt securities issued by non-residents plus domestic issues targeting international markets)*	2002 Q1	7,782	38.4	44.8	6.2	10.5
	2002 Q2	8,635	38.9	44.5	6.1	10.6
– Narrowly defined *(debt securities issued by non-residents)*	2002 Q1	3,498	28.5	44.1	13.0	14.5
	2002 Q2	3,826	29.0	43.8	12.6	14.7

Sources: BIS, ECB calculations.

1) *Percentage share calculated at constant 1994 Q1 exchange rates. The sum of the shares may not exactly equal 100% due to rounding.*

Table A.2

Relative sizes of international market segments in global debt securities supply

(2002 Q1)

Supply segment	Outstanding amount (USD billions)			
	All currencies	Euro	US dollar	Japanese yen
Global supply	38,583	7,809	19,550	6,278
International supply				
– Broadly defined	7,782	2,547	3,933	426
– Narrowly defined	3,498	845	1,729	395
Broadly defined/Global	20.2%	32.6%	20.1%	6.8%
Narrowly defined/Global	9.1%	10.8%	8.8%	6.3%

Sources: BIS, ECB calculations.

billion (i.e. about one-fifth of the global market) and under the narrow definition to about USD 3,500 billion (i.e. about one-tenth of the global market).

It is also interesting to compare, for each of the three main internationally used currencies, the size of the international segment with the overall stock of its global issuance. This share gives a notion for each currency of how important the international market is relative to its total market. Interestingly, in the first quarter of 2002, the relative importance of the international segment was the highest for the euro at 33% and 11% according to the broad and narrow definitions, respectively (Table A.2). This means that of the total of euro-denominated debt securities outstanding globally, about one-tenth has been issued outside the euro area and about one-fifth (i.e. the difference between the broad and narrow concepts) has been issued within the euro area, but targeted at the international financial market. Among the three main international currencies, the relatively high shares for the euro show that, in relative terms, international debt markets are most important for the euro. These shares were lower for the US dollar (at 20% and 9% respectively) and the yen (at about 6-7% for both definitions), indicating that relative to the home market, international debt securities played a smaller role for these two currencies. The fact that for the yen both definitions give similar results shows that there were only very few yen issues by Japanese residents targeted explicitly at the international financial market.[6]

The broadly defined international debt securities market

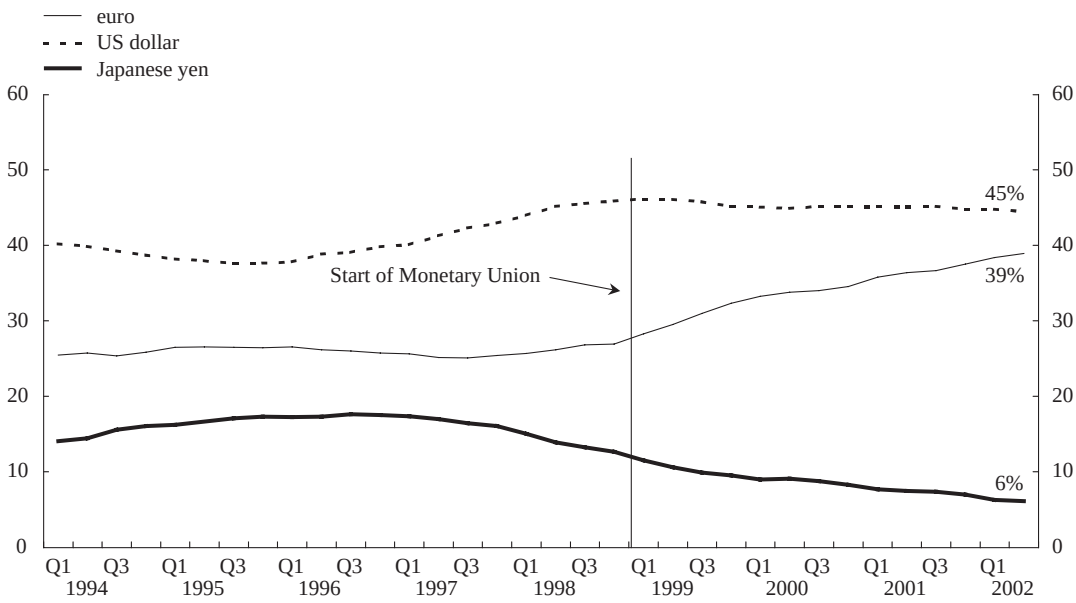
For broadly defined international debt securities (i.e. the securities either issued outside the respective currency areas considered here or issued within the areas and targeted at the international financial market), the euro accounted for a share of 39% of the market, compared with a share of 45% for the US dollar and 6% for the yen (Chart A.1). Compared with end-2000 (the cut-off date of last year's review), the euro's share has risen by 4 percentage points, while the share of the US dollar declined slightly and that of the yen almost halved. The relatively low share of the yen confirms the limited use made of this currency outside Japan.

6 *The ECB also publishes securities issuance statistics – produced by the Eurosystem – in its Monthly Bulletin (Tables 3.5 and 3.6 in the "Euro area statistics" section). The total amount outstanding (issues by residents plus non-residents) of debt securities issued in euro stood at €8,161 billion (USD 7,114 billion) at the end of March 2002, somewhat below the amount reported in Table A.2 (USD 7,809 billion). This difference may be accounted for by the use of different data sources. BIS data are used in this report to ensure comparability with other currencies, as there are no methodologically equivalent data to those of the Eurosystem for the US dollar and Japanese yen.*

Chart A.1

Broadly defined international debt securities: currency shares

(bonds and notes and money market instruments, as a % of total amount outstanding)



Sources: BIS, ECB calculations.

A similar picture to that described above for debt securities can be found for international bank liabilities, as reported to the BIS.[7] Over the reporting period, the share of the euro in international bank liabilities increased by 3 percentage points to 24%, which compares with a share of 55% for the US dollar and 7% for the Japanese yen.[8] A comparison with the above figures shows that international debt securities are somewhat more evenly distributed between the US dollar and the euro, whereas the international banking market is more strongly dominated by the US dollar.

As noted in last year's review, the rise in the euro's share over the past few years can be partly explained by an expected and actual increase in liquidity owing to the creation of an integrated money market.[9]

Turning to flows, which give an indication of the most recent trends, developments were marked by a noticeable increase in the euro's share over the review period, both for bonds and notes and for money market instruments (Table A.3). The share of the euro in announced issues of broadly defined international bonds and notes, albeit volatile over the reporting period, increased to 40% in the second quarter of 2002.[10] This compares with 45% for the US dollar and 5% for the Japanese yen. Overall, the resilience of the euro's share over the recent period, which on average was more than 10 percentage points higher than its pre-Stage Three levels, increases the likelihood that,

7 *Banks reporting to the BIS are from 32 countries including industrialised countries and major offshore centres. Liabilities reported include: (i) the stock of own securities that banks issued in the international market; and (ii) international deposits. Euro data are net of the "arithmetic" EMU effect, with the whole euro area being treated as domestic.*

8 *If one did not correct for the depreciation of the euro since 1998, the trend would be flat (with a 19% euro share). This shows that the currency distribution of international bank liabilities is more stable than that of the stock of international debt securities.*

9 *Regarding the bonds and notes market, Santos and Tsatsaronis (2002) recently argued that non-resident corporate bond underwriters anticipated the increased attractiveness of a unified domestic demand side in the euro area and therefore entered the market, which brought down underwriting fees to levels comparable with issuance in US dollars and contributed to the rise of the euro's share.*

10 *Flows, according to the BIS data considered here, are "announced issues". These figures are not directly comparable with those published in the ECB Monthly Bulletin (Table 3.6 of the "Euro area statistics" section), which are based on "completed issues".*

Table A.3

Major currencies' shares in long-term and short-term international debt securities flows (broad definition)

(%)

	Bonds and notes			Money market instruments		
	2000 Q4	2001 Q4	2002 Q2	2000 Q4	2001 Q4	2002 Q2
Euro	35.1	39.9	40.5	32.4	35.0	36.3
US dollar	46.7	44.0	44.8	46.4	38.4	38.1
Japanese yen	5.0	4.7	4.5	5.2	7.2	5.1

Sources: BIS, ECB calculations.
Note: Values at current exchange rates.

also in this segment, Economic and Monetary Union (EMU) caused a structural break.[11]

In the international money market, recent flow data seem to confirm the earlier hypothesis of a regime shift towards euro-denominated issuance following the creation of an integrated euro money market. Over the review period, the share of the euro in broadly defined announced issues of international money market instruments, albeit volatile, increased by 3 percentage points and reached about 36% in the second quarter of 2002. In the first quarter of 2002, international money market issuance in euro even exceeded that in US dollars, with a 39% share against 38% for the US dollar.

The narrowly defined international debt securities market[12]

In line with evidence gained from data under the broad definition, the share of the euro in the narrowly defined stock of international debt securities remained on a gradual upward trend, rising by 3 percentage points to 29% in

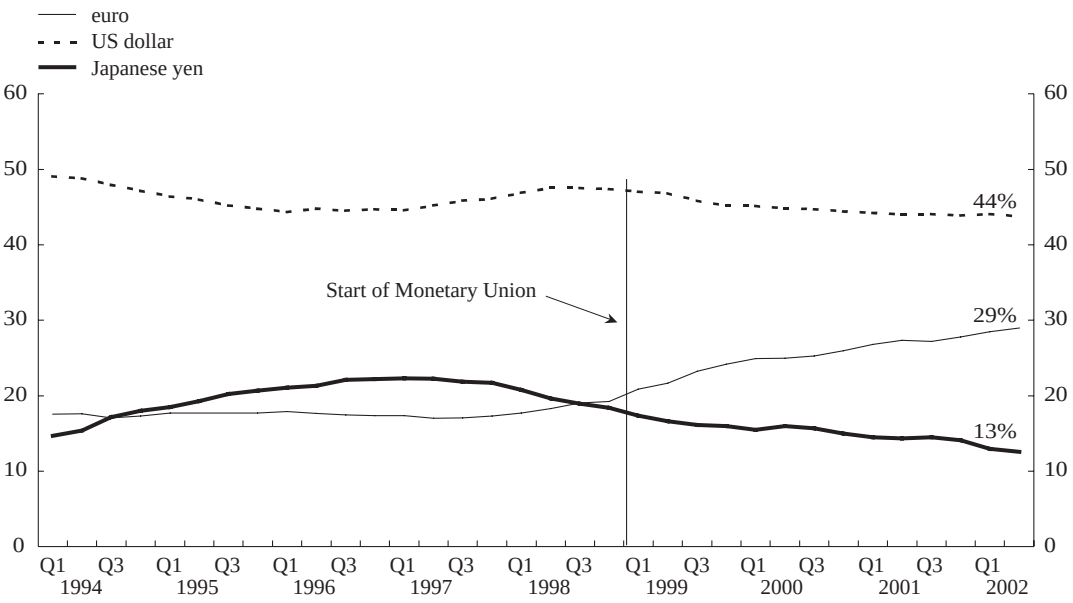
11 Last year's review had already reported a strong and lasting increase in euro-denominated issues in the international money market in 1999 and 2000. The latter could be explained by an expected and actual increase in liquidity following the creation of an integrated euro money market.

12 Data relating to debt securities in euro issued by non-residents of the euro area as shown in Tables 3.5 and 3.6 of the "Euro area statistics" section of the ECB Monthly Bulletin are comparable with the "narrow" measure of international debt securities in this review.

Chart A.2

Narrowly defined international debt securities: currency shares

(bonds and notes and money market instruments, as a % of total amount outstanding)



Sources: BIS, ECB calculations.

Table A.4

Major currencies' shares in long-term and short-term international debt securities flows (narrow definition)

(%)

	Bonds and notes			Money market instruments		
	2000 Q4	2001 Q4	2002 Q2	2000 Q4	2001 Q4	2002 Q2
Euro	28.6	29.2	30.9	21.1	19.6	19.6
US dollar	36.0	41.7	45.6	57.6	50.5	51.3
Japanese yen	11.6	11.4	8.5	7.0	9.8	7.0

Sources: BIS, ECB calculations.
Note: Values at current exchange rates.

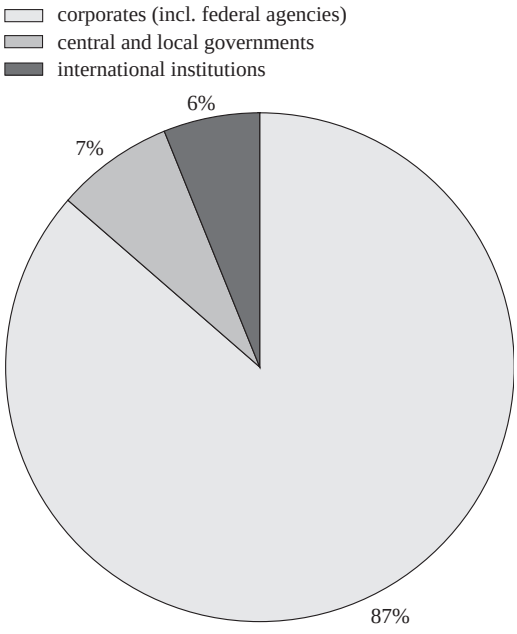
the second quarter of 2002 (Chart A.2). This share compares with 44% and 13% for the US dollar and the Japanese yen respectively, whose shares decreased slightly over the review period.

Turning to developments in flows over the review period, the euro's share in announced issues of international bonds and notes increased by 2 percentage points to 31%, against 46% for the US dollar and 9% for the Japanese yen (Table A.4). This corresponds to a total issuance amount of around USD 375 billion of euro-denominated bonds and notes by non-euro area residents over the review period.

Regarding the non-euro area issuers of euro-denominated bonds and notes,[13] a sectoral breakdown shows that the main issuers are large multinational corporations (including US federal agencies), which account for 87% of the market (Chart A.3).[14] The remainder of the market is split almost equally between foreign governments (7%) and international institutions (6%).[15]

Chart A.3

Euro-denominated bond and note issues by non-euro area residents over the review period: breakdown by issuer type



Sources: Bondware, ECB calculations.

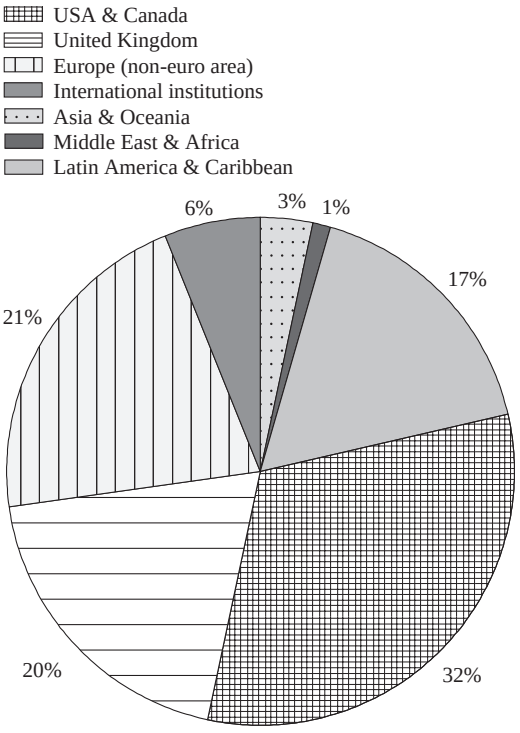
Some of the largest issues will be further analysed in Sub-section 1.3. A breakdown by nationality of euro-denominated issues abroad indicates that the largest share is accounted for by issuers in the United States with 30%, followed by the United Kingdom with 20% (Chart A.4).[16]

Other major issues come from the non-euro area European countries (with a 21% share, in particular from Denmark and Sweden each with 6% and the accession countries with

13 Available data refer only to issuers of bonds and notes; no data are available for issuers of money market instruments.
14 It is worth noting that the high share of euro-denominated corporate bonds and notes in international issues is in line with the strong rise in domestic issuance of euro-denominated corporate bonds and notes (+84% between end-1998 and the first quarter of 2002).
15 These breakdowns were obtained from Bondware. Bondware data are not identical with the BIS data used to compute the narrow and broad measures, but there is much similarity.
16 In addition, following a convention applied to all currency areas, international institutions are not classified as belonging to the domestic sector. Therefore, bonds in euro from the European Investment Bank, for example, are considered to be issued by non-euro area residents. Likewise, bonds issued by the World Bank or the Inter-American Development Bank are considered as being issued by non-US residents.

Chart A.4

Euro-denominated bond and note issues by non-euro area residents over the review period: regional breakdown



Sources: Bondware, ECB calculations.

3%) and from international corporations which, presumably for tax reasons, are registered in the Cayman Islands (15%). Issues from entities in Africa, Asia and Oceania, Latin America (where borrowers are mainly from the public sector) and the Middle East accounted for only 7% of total issuance. This may suggest, to some extent, that future international euro-denominated issuance is unlikely to be much affected by developments such as emerging market crises, either in Asia or Latin America. Conversely, it will be particularly relevant to monitor developments in the segment of euro-denominated issues by US corporations, given the importance of this segment and the recent difficulties that some US corporations have encountered in financial markets following, for example, the Enron and WorldCom affairs.

Turning to money market instrument issues, the euro's share decreased by 1 percentage point to 20% in the second quarter of 2002. The US dollar still largely dominated with a 51% share, while that of the Japanese yen stood at 7%.

1.2 The demand side

The following sub-section discusses the demand side of international debt securities, in particular those denominated in euro. The main questions considered are the following: to what extent do international investors hold euro-denominated international debt securities, which regions and sectors do these investors belong to, and how has this demand changed compared with the previous review? These questions have to be answered against the background of some apparently puzzling observations. While the supply of international bonds in euro both from outside the euro area (narrow definition) and from within the euro area (broad definition) has been growing, compared with other international currencies there is little evidence that international demand has followed the same pattern, with the exception of data on asset holdings by international banks. There are two closely related reasons for this. On the one hand, financial hubs like the City of London have redirected to the euro area bonds and notes originally issued for investors outside it. On the other hand, euro area residents have purchased most euro-denominated debt securities issued by non-euro area residents. There is evidence for both these factors.

Demand from non-euro area residents

Overall, at the end of the first quarter of 2002, the euro accounted for 24% of the assets of international banks reporting to the BIS, including international loans, international debt securities and foreign equities. These assets amounted to around USD 2,300 billion. The euro's share compares with shares of 52% for the US dollar and 11% for the Japanese yen. Throughout the review period, the share of the euro in international bank

Box 2

Challenges related to the interpretation of developments in international debt markets

The evolution of the shares of the three major currencies in announced issues of narrowly defined international bonds and notes was volatile over the review period. Noticeable swings were observed in particular in the third quarter of 2001. In this quarter, Japanese yen-denominated issues exceptionally exceeded euro-denominated issues,[1] since the consequences of the events of 11 September were felt less in regions traditionally issuing in yen than in the United States or Europe. Here, issuance in September 2001 was very weak, which contrasts with the usual seasonal patterns according to which September is a month of very strong debt issuance.[2] Issuance was negatively affected especially in euro, since a significant share of international euro-denominated issuance originates from the United States. These specific developments changed again from the fourth quarter of 2001 onwards, as issuance in US dollars and euro picked up and that in yen declined to an "all-time" (sample) low of 7% in the first quarter of 2002.[3]

Turning to broadly defined international issues, it is worth noting that euro-denominated net issuance of floating rate bonds and notes has exceeded dollar-denominated floating rate issuance since the start of Stage Three. The reverse holds true for straight fixed rate issues.[4] In 2001, the gap between dollar-denominated fixed and floating rate issues became particularly large, with floating rate issues declining strongly. Possibly, liability managers expected US interest rates to bottom out and euro area interest rates to fall further. However, actual interest rate movements in 2001 did not meet such expectations, as movements in ten-year government bond yields in the euro area and the United States were limited. Yields remained in the neighbourhood of 5% in both markets and three-month money market rates fell faster in the United States (by roughly 4.5 percentage points) than in the euro area (where they decreased by 1.5 percentage points).[5]

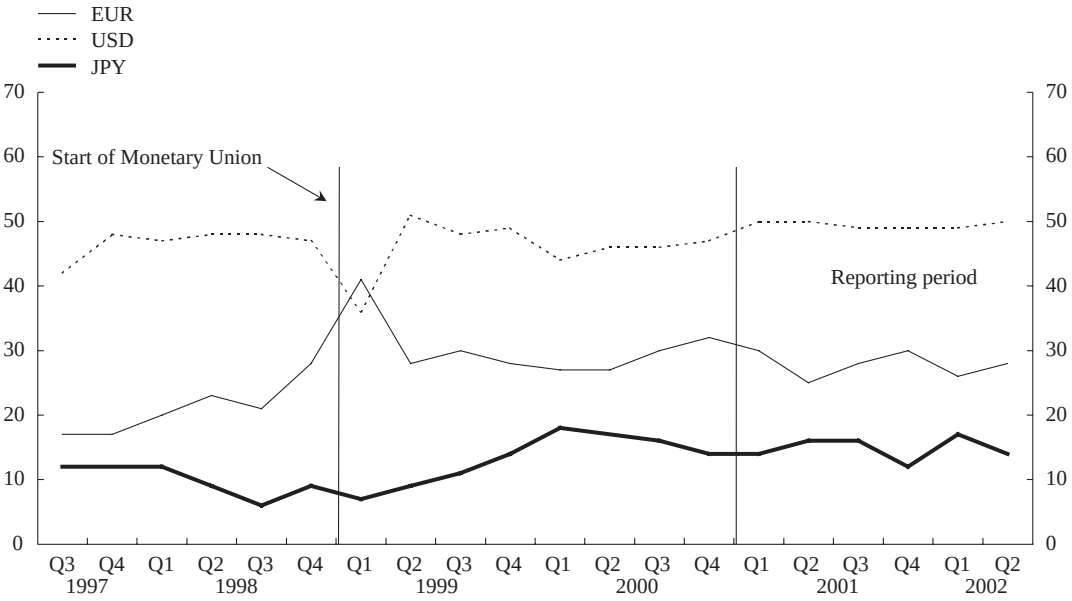
In general, it is difficult to relate the above developments in the international debt securities market to macroeconomic variables. In 2001, GDP growth rates in the euro area and the United States declined in tandem, and the fact that US money market rates fell increasingly short of the equivalent euro area rates should, if anything, have boosted money market issuance in US dollars, which was not however the case. The drop in US dollar-denominated issuance could be attributed to difficulties in the commercial paper market related to corporate rating downgrades combined with buying restrictions on US mutual funds for lower-rated commercial paper. As a result, corporate financing has shifted to longer-term maturities.[6] Perhaps the only effect attributable to macroeconomic developments is the decline in the yen share of announced issues of broadly defined international bonds and notes, by 2 percentage points over the review period (excluding the third quarter of 2001). This decline was accompanied by a weakening of the currency, which may have further reduced issuance denominated in this currency, since appreciation expectations may have been triggered by a perceived "excessive" depreciation of the exchange rate (uncovered interest parity – a widespread assumption among liability managers – failed to hold).

1 *This was also the case in the second quarter of 2000 which saw a boom in absolute Japanese yen-denominated issues. The latter arose from strains related to: (i) the financing of UMTS licences in Europe, which led to a decrease in international euro-denominated issues; and (ii) rising default rates on junk bonds and mounting fears of recession in the United States, which depressed international USD issuance (see the 2001 review of the international role of the euro).*
2 *See BIS (2002a), p. 28.*
3 *Issuance in pounds sterling also proved weak in the second quarter of 2002.*
4 *See BIS (2002a), Graph 3.2, p. 29.*
5 *See ECB Monthly Bulletin, various issues, Tables 3.1, 3.2, 5.1 and 12.1 of the "Euro area statistics" section.*
6 *See BIS (2002b), p. 25.*

Chart A.5

Currency shares in the bond portfolios of large fund managers

(as a % of total)



Source: The Economist.
Note: The euro before 1998 Q4 is the sum of the Deutsche Mark and the French franc. Eight to nine large fund managers surveyed.

assets remained flat, although it is still 6 percentage points higher than the legacy currencies' share pre-1999.[17]

While indicators for international bank assets show an increase in the euro's share, statistics on international portfolio allocation provide mixed evidence, with trends differing according to the geographical location of investors.

The Economist's quarterly portfolio polls of asset managers provide some initial information on the currency distribution of world portfolios.[18] The polls suggest that the share of the euro stood in mid-2002 at about the same level as when it was introduced in 1999, at 28%, having however decreased by 4 percentage points over the reporting period (Chart A.5).[19]

Data from Capital Access International, a financial information provider, show a clear dichotomy between developments, on the one hand, in the United States and Canada and, on the other hand, in non-euro area European economies. In Northern America, the euro's share in bond portfolios was negligible[20] (based on bond portfolios

17 Since there is no split available between the different types of assets, it is difficult to ascertain whether this increase arises from a higher demand for euro-denominated debt securities or for either euro-denominated loans or euro-denominated equities.

18 These portfolio polls are based on the statements of eight to nine major global asset managers, including one to two from the euro area, and tend to reflect preferences of a group of "truly international" investors, relatively unaffected by home bias. However, they have to be interpreted with care for three reasons: (i) respective currency shares are simple arithmetic averages, which do not account for the (unpublished) size of the respective investment; (ii) the sample of asset managers is small and might not be representative; and (iii) the nationality of the owners of the funds invested is obviously unknown.

19 The geographical distribution of equity investment according to The Economist's quarterly portfolio polls also indicates that European (excluding the United Kingdom) equity holdings, which can be seen as a proxy for euro area holdings, amounted in mid-2002 to 23%, slightly above benchmark (i.e. the Morgan Stanley Capital International world equity index). This compares with 50% for the US dollar and 10% for the Japanese yen. According to these polls, equity investments in Europe have trended more or less sideways since 1999, which tends to confirm that euro-denominated investment did not encounter a comparable boom to that in euro international debt security issuance.

20 However, it is highly probable that an important share of euro-denominated holdings under management in non-euro area Europe belongs to US investors, as several US investment houses hold their euro portfolios in the City of London (as well as in the euro area itself).

Table A.5

Currency breakdown of funds under management according to the eMaxx database

(based on most recent filings, end-of-period percentages)

	Euro	US dollar	Japanese yen	Others
Funds under management in the United States and Canada				
June 1999	0.4	97.2	0.7	1.7
December 1999	0.5	97.5	1.0	1.0
June 2000	0.3	97.6	0.8	1.4
December 2000	0.3	97.8	0.8	1.1
June 2001	0.4	95.8	2.2	1.7
December 2001	0.4	97.2	0.8	1.7
June 2002	0.4	96.7	1.4	1.5
Funds under management in non-euro area Europe				
June 1999	26.1	20.1	0.6	53.2
December 1999	21.4	25.8	0.7	52.1
June 2000	27.8	24.9	0.7	46.6
December 2000	29.7	23.0	1.4	45.9
June 2001	32.1	21.3	2.2	44.5
December 2001	34.1	17.3	2.9	45.7
June 2002	33.9	15.7	2.9	47.6

Sources: Capital Access International, ECB calculations. The sum of the shares may not exactly equal 100% due to rounding.

surveyed in the eMaxx database).[21] In absolute terms, surveyed bond holdings in euro in Northern America only amounted to USD 16 billion. As the eMaxx database only covers around 30% of all funds under management in this region, actual bond holdings might however be three times higher.

Conversely, in non-euro area Europe[22] the share of the euro in bond portfolios has increased, from 26% at the beginning of EMU to 34% in June 2002. During the entire 1999-2002 period, the share of the euro exceeded that of the US dollar. In absolute terms, the stock of euro-denominated bonds under management in the countries neighbouring the euro area equalled USD 33 billion in July 2002, according to this information provider. However, since the eMaxx database captures only 3.5% of total assets in non-euro area Europe, the total amount of euro-denominated bonds under management in non-euro area Europe is deemed to be much higher.

There is further evidence that the currency breakdown of bond portfolios is rather different in the United States and non-euro area Europe. Some studies use demand from US residents for bonds issued in the euro area (of which around 90% are euro-denominated) as a proxy for demand from US residents for euro-denominated bonds (issued in the euro area or elsewhere).[23] On this measure, demand from US residents for euro-denominated bonds was moderate over the review period, with net purchases of USD 2.8 billion (Chart A.6).[24]

Likewise, in Japan, net purchases of bonds issued in the euro area were limited in 2001, at around USD 200 million. Japanese residents

21 *The eMaxx database reports holdings of debt securities managed by a number of mutual funds, pension funds and insurance companies. These holdings are available on a security-by-security basis. Total holdings included in the database amount to around USD 4,900 billion (at nominal value), corresponding to 18,870 portfolios. The geographical coverage is mainly focused on the United States, Canada and Europe. Data may be entered in the database with time lags so that the degree of coverage of portfolios may not necessarily be the same at different points of a time series. Data have been double-checked to make sure they include all legacy currency securities during the 1999-2001 transition period.*

22 *Non-euro area Europe includes, in this case, Denmark, Liechtenstein, Monaco, Norway, Sweden, Switzerland and the United Kingdom.*

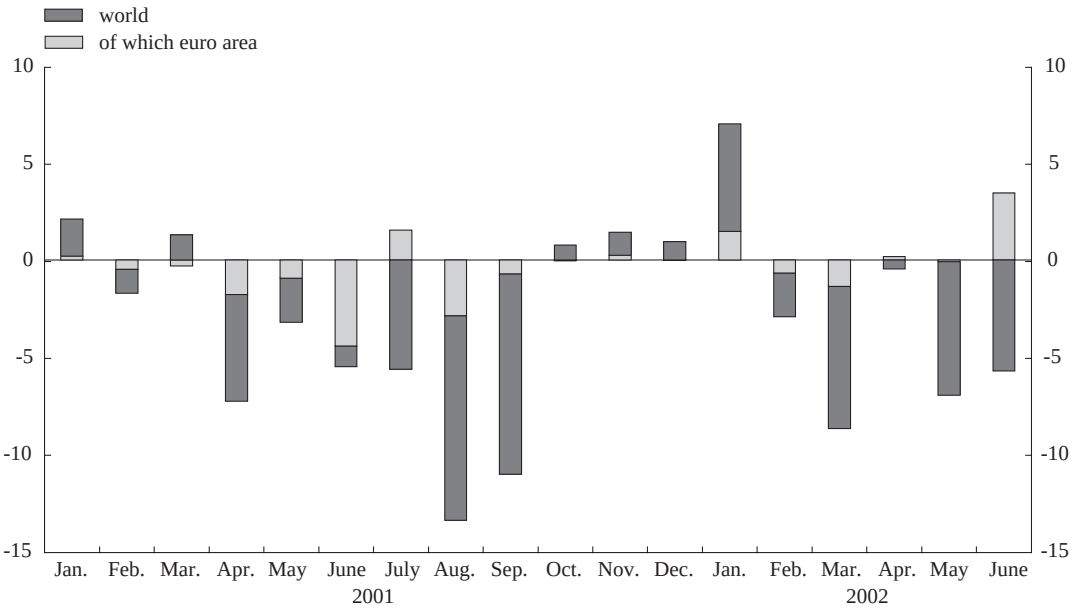
23 *Galati and Tsatsaronis (2001); White, Galati and Tsatsaronis (2002).*

24 *More precisely, data refer to US residents' bond purchases from euro area counterparts. For this reason, Warnock and Cleaver (2002) suggest the data should be interpreted cautiously, arguing inter alia that they could overestimate holdings by the United Kingdom (owing to the role of the City of London) and thereby underestimate holdings of securities issued elsewhere (including the euro area).*

Chart A.6

Net purchases by US residents of foreign-issued bonds

(USD billions)



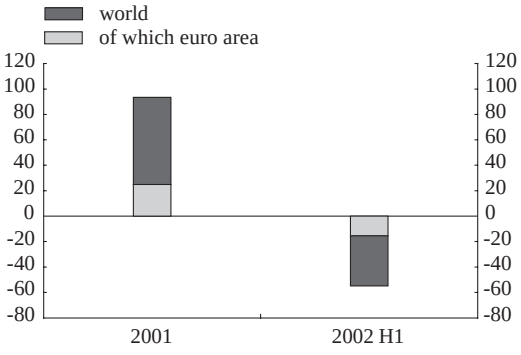
Sources: US Treasury, ECB calculations.
Note: Negative figures represent net sales.

were even net sellers of bonds issued in the euro area in the first half of 2002, for an amount close to USD 120 million (Chart A.7).

Chart A.7

Net purchases by Japanese residents of foreign-issued bonds

(JPY billions)



Sources: Japanese Statistics Bureau & Statistics Center, ECB calculations.

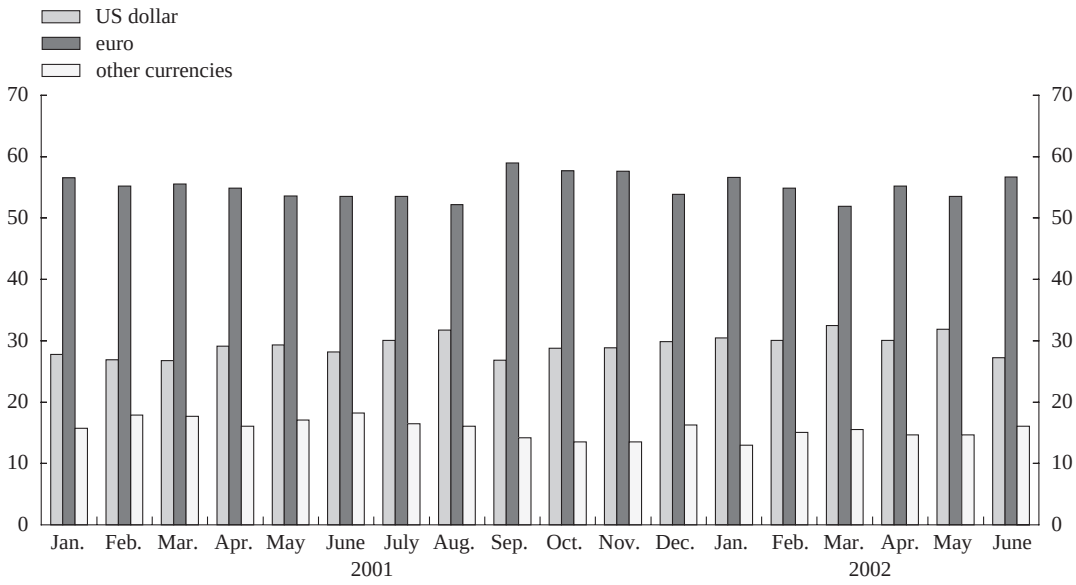
While demand from the United States and Japan has been limited, market activity in euro has become more important in the City of London. The currency breakdown of a leading reporting system for eurobond transactions among mostly London banks, TRAX, provided by the International Securities Market Association (ISMA), shows that over the reporting period between 50% and 60% of monthly turnover was conducted in euro, with the share of the US dollar ranging between 25% and 35% (Chart A.8).[25]

25 *TRAX is a reporting system used by 198 banks and investment houses to organise centrally the reporting of over-the-counter deals in the secondary market for bonds and other products. Above-mentioned data refer to bonds only. Of all banks associated with TRAX, 167 are based outside the euro area of which 159 in London.*

Chart A.8

TRAX reporting system: currency breakdown of monthly turnover

(as a % of total)



Sources: ISMA, ECB calculations.

Box 3

The euro in the City of London

Official data on the role of the euro in the business of banks operating in the United Kingdom (of which the City of London takes the major share) are published regularly by the Bank of England. According to these data, the euro represents 19% of total deposits and 22% of total assets of UK banks. Considering only deposits and assets in foreign currency, the share of the euro increases to 34% and 41% respectively. In the domestic UK interbank market, the euro accounts for 13% of total liabilities and assets (and for more than one-third of interbank liabilities and assets in foreign currency).

Table: Share of the euro in liabilities and assets of banks operating in the United Kingdom

(%)

	Liabilities				Assets			
	Total deposits	Sight and time deposits of UK banks	Sight and time deposits of non-residents	CDs and other short-term paper	Total assets	Loans to UK banks	Loans to non-residents	Investments with non-residents
	Share of the euro in respective aggregates in all currencies (pounds and foreign currencies)							
January 1999	18.0	11.8	26.6	7.5	19.3	12.0	24.9	37.9
January 2000	15.8	9.1	22.2	10.9	17.7	8.2	24.3	37.6
January 2001	17.2	13.3	22.3	10.8	20.6	13.1	27.6	38.9
January 2002	17.5	14.8	21.9	11.4	20.6	13.9	26.1	40.0
June 2002	18.7	13.3	24.4	12.8	21.9	13.0	28.1	44.2
	Share of the euro in respective aggregates in foreign currencies only							
January 1999	34.7	33.4	31.8	15.8	36.3	33.9	28.3	39.7
January 2000	31.5	27.1	27.2	21.1	35.0	24.9	27.8	39.8
January 2001	31.4	30.4	26.8	19.0	38.4	31.0	31.1	41.4
January 2002	31.7	37.9	26.4	19.0	38.0	35.6	29.3	42.8
June 2002	34.3	37.7	29.4	21.2	40.8	35.4	31.5	47.0

Sources: Bank of England, ECB calculations.
Note: Liabilities and assets in foreign currencies are converted into British pounds at current exchange rates and are therefore subject to exchange rate fluctuations.

The pivotal role of the City in the international use of the euro becomes even more evident when considering UK banks' operations with non-residents. A quarter of non-residents' total deposits are in euro; on the asset side, 28% of total loans to (and 44% of investments with) non-residents are denominated in euro. Considering only business in foreign currency (i.e. non-sterling), the share of the euro would be even higher.

The City is, at the same time, one of the international financial centres using the euro and an integral part of the Single Market. It is one of the main channels through which non-euro area residents purchase euro-denominated bonds issued inside and outside the euro area. Demand from City-based investment houses can be considered, in this respect, as lying halfway between demand from non-euro area residents and demand from euro area residents.

Demand from euro area residents

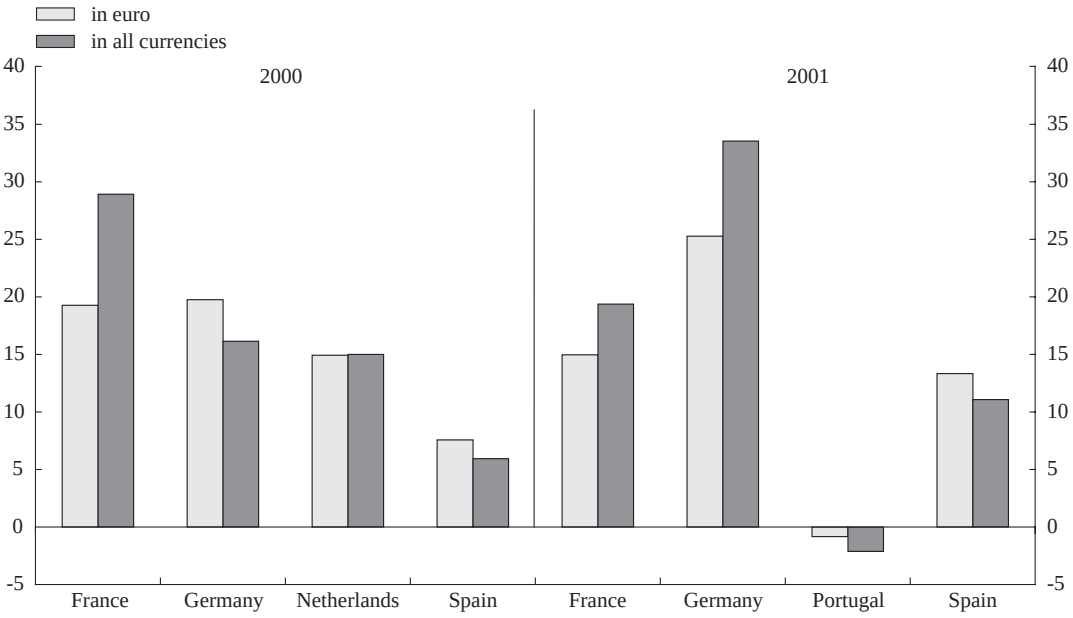
Supply of international financial assets need not be matched by demand from non-residents, since any gap can be filled by domestic investors. There are indeed signs that demand from the euro area for euro-denominated debt securities issued outside the euro area has been relatively substantial over recent years.

In the preparation of this review, the Eurosystem has collected for a number of euro area countries, when available, data on the currency breakdown of net purchases by residents of debt securities issued outside the euro area. In 2001, investors in the four countries included in the exercise purchased €53 billion (in net terms) of bonds and notes issued in euro outside the euro area (Chart A.9), which accounted for 85% of their net purchases of bonds and notes from non-euro area residents, against €62 billion

Chart A.9

Net purchases by selected euro area countries of bonds and notes issued outside the euro area

(USD billions)



Source: National central banks of the respective countries.

(93% of net purchases) in 2000.[26] Unfortunately, no similar currency breakdown is available in the international investment position for the euro area as a whole.[27] Also data for 2002 and 2001 cannot be easily compared, as they refer to different groups of euro area countries.

Anecdotal evidence from market sources confirms that a significant share of euro-denominated debt issues abroad is held by euro area residents. In particular, the weekly magazine *International Financing Review* gives indications of the location of underwriters in the primary market for euro-denominated bonds issued abroad. Focusing on the 100 largest issues over the review period, the vast majority of bonds, for which information was available, are reported to be chiefly underwritten by investors located in Europe, namely in the euro area, the United Kingdom and Switzerland. Only the very largest issues were placed with worldwide investors, including investors from the United States; however, an important share was bought by European investors and often with the participation of central banks. Asian investors, on the other hand, seemed to exhibit less interest as underwriters or investors.

Similar patterns tend to characterise another market segment, namely euro-denominated bonds issued in emerging markets neighbouring the euro area (eastern Europe, Middle East and Africa). Whenever information was available, euro area investors accounted for almost half of the underwriters, while the United Kingdom, Switzerland and the rest of Europe (including central and eastern Europe) accounted for only a quarter.[28] Investors in the country of the borrower represented around one-fifth, while US investors were found to have little interest. In comparison, for US dollar-denominated bonds issued by the same group of countries, US investors accounted for roughly one-third of underwriters, while euro area investors accounted for around one-fifth.[29]

1.3 Some structural aspects of two specific market segments

The analysis of two specific market segments can help shed light on some structural aspects of the supply of euro-denominated international bonds and notes: (i) the 100 largest issues, which also represent a large share of the overall market; and (ii) issues by emerging markets neighbouring the euro area (eastern Europe, Middle East and Africa), which are the only regions outside the euro area where the euro is the dominant international financing currency. These two segments will be briefly discussed below.

The 100 largest issues

Over the review period, the 100 largest euro-denominated bond issues by non-euro area residents[30] amounted to €155 billion, i.e. around 40% of all narrowly defined international issues. The largest issuers were in the United States, including industrial companies, federal agencies and banks. Some issuers even had regular financing programmes, such as Freddie Mac's (a US federal agency specialised in mortgage loans) programme of "EuroReference Notes" amounting to €20 billion per year with

26 *Strictly speaking, the 2001 and 2000 figures cannot be compared with each other as the lists of countries differ. No data are available for Portugal in 2000 or for the Netherlands in 2001. Data are not fully consistent from a methodological point of view, as for instance some are based on the currency of settlement rather than of denomination of the securities purchased.*

27 *However, it is telling to note that net issues of euro-denominated bonds and notes by non-euro area residents were comparable in size since 1999 with the net purchases by euro area residents of foreign (i.e. issued by non-euro area residents) bonds and notes reported in the euro area balance of payments. This could suggest that the majority of investors buying euro-denominated bonds issued outside the euro area are indeed euro area residents. Evidence for money market instruments from euro area countries' international investment positions and from the euro area balance of payments is less clear-cut, but this market is much smaller.*

28 *It is possible that the interest of euro area residents for euro-denominated bonds issued by accession countries reflects so-called "convergence play" strategies, in anticipation of their entry into the European Union (and later on into the euro area).*

29 *This information is taken from various issues of the International Financing Review from 2001 and 2002.*

30 *A significant share (possibly one-fifth in volume terms) of non-euro area issues is in fact from subsidiaries of euro area companies located outside the euro area (and often specialised in issuing securities).*

Table A.6

Some characteristics of the six largest euro-denominated bond issues by non-euro area residents

Issuer	Face value (€ millions)	Years to maturity	Location of underwriters	Types of underwriters	Bookrunner	Governing laws	Selling restrictions
In the first half of 2002							
Ford Motor Credit Co.	5,000	3	450 orders, mostly placed in the UK, Italy, Germany and France		BNP Paribas, Dresdner Kleinwort Wasserstein, UBS Warburg	New York	US, UK
Federal Home Loan Mortgage Corp. (Freddie Mac)	5,000	5	26% Asia; 22% US; 52% Europe (including: 14% Germany; 10% Scandinavia; 3% UK)	28 central banks underwrote the securities, mainly from Asia	Morgan Stanley & Co. International Ltd., Goldman Sachs International, Deutsche Bank AG London	New York	US, UK
European Investment Bank	5,000	10	79% Europe (of which: 16% Scandinavia; 23% UK); 9.8% US; 7.3% Asia		Credit Suisse First Boston (Europe) Ltd., Merrill Lynch International, UBS Warburg	Luxembourg	None
In 2001							
European Investment Bank	5,000	5	15% Italy; 13% North America; 9.5% non-Japan Asia; 9.5% Japan; 8.5% Germany; 7% UK; 5% Switzerland; 5% rest of Europe	42% funds; 23% banks; 21% central banks; 5% corporates	BNP Paribas, Deutsche Bank AG London, Morgan Stanley & Co. International Ltd.	Luxembourg	None
Federal Home Loan Mortgage Corp. (Freddie Mac)	5,000	10	20% UK; 12% Germany; 12% Scandinavia; 6% France; 10% US; 10% Asia (including Japan)	50% investment managers; 20% banks; 15% insurance and pension funds; 10% central banks	Dresdner Kleinwort Wasserstein, Goldman Sachs International, Salomon Brothers International Ltd.	New York	None
Federal Home Loan Mortgage Corp. (Freddie Mac)	5,000	3	60% Europe; 23% Asia; 17% US	Share of central banks noticeable	BNP Paribas, Lehman Brothers International, Merrill Lynch International	New York	None

Source: International Financing Review, various issues.

regular €5 billion issues. Among the multilateral institutions, the European Investment Bank[31] (EIB) is the only one which – besides issuing an important amount in euro – has issued a similar instrument called the "Euro Area Reference Note", guaranteeing a liquid market along the yield curve (from below one year up to ten years). The EIB's issuance activity in US dollars is also becoming increasingly important.

The aforementioned information published in the *International Financing Review* suggests that a significant share of new issues was underwritten by European investors. In addition to strong interest from European investors, this could be explained by selling restrictions that were often in force for the placement of these bonds in the United States and the United Kingdom. This notwithstanding, bookrunners typically included at least one European bank and one US bank. Information on the types of underwriters is scarce, but whenever available, tended to indicate that institutional investors were dominant, with relatively little demand from retail investors for this set of large issues. Occasionally, there was also anecdotal evidence that payments in euro were swapped into US dollars, in particular by US issuers.

31 *As explained above, all supranational issuers are, by convention, considered as not belonging to any domestic currency area. The European Investment Bank is therefore considered as a non-euro area resident.*

Table A.7

List of non-euro area issuers of the top 100 euro-denominated bonds

AT&T Corp.	Gallaher Group plc	Petronas Capital Limited
Bank of Scotland	Geldilux 2001-1 Ltd.	Province of Quebec
Bank of Scotland Treasury Services plc	General Electric Capital Corp.	RBS Capital Trust A
Barclays Bank plc	General Motors Acceptance Corp.	Repsol International Capital Ltd.
BBVA Global Finance Ltd.	Hamburgische LB Finance (Guernsey) Ltd.	Republic of Bulgaria
BMW US Capital LLC	Household Finance Corp.	Republic of Hungary
Bradford & Bingley plc	Imperial Tobacco Finance plc	Republic of Poland
British Telecommunications plc	International Lease Finance Corp.	Republic of Romania
Caixa Geral de Depositos Finance	JP Morgan Chase & Co.	Republic of Turkey
Caymadrid International Ltd.	Kingdom of Denmark	Rio Tinto Finance plc
Chester Asset	Lloyds TSB Group plc	Royal Bank of Scotland plc
Citibank Credit Card	MBNA Credit Card Master Note	SCA Coordination Center NV
Daimler Chrysler North America	mmO2 plc	SL [Standard Life] Finance plc
Deutsche Bank Finance NV Neth. Antilles	Morgan Stanley Dean Witter & Co.	TDC A/S
Europa Two Ltd.	NBG [National Bank of Greece] Finance plc	Telefonaktiebolaget LM Ericsson
European Investment Bank	NGG Finance plc	Telstra Corp Ltd.
Federal Republic of Yugoslavia	Nordbanken AB	Tokyo Electric Power Co Inc.
Federative Republic of Brazil	NordLB Norddeutsche Securities plc	Volkswagen Car Lease (VCL) No. 5 Ltd.
Ford Motor Credit Co.	Northern Rock plc	WorldCom Inc.
Freddie Mac	Permanent Financing No. 1 plc	

Source: International Financing Review, various issues.
Note: Issuers may have issued several bonds over the review period.

Emerging markets neighbouring the euro area

Emerging markets neighbouring the euro area (with issues amounting to around €10 billion over the review period) account for only a 5% share of the international euro-denominated bond market. This region is, however, the only one in the world outside the euro area where the euro is the leading international financing currency, with issuance in euro being about twice that in US dollars between September 2001 and August 2002. Within this region, the euro prevailed in central and eastern Europe, as well as in the Balkans, while the US dollar dominated in Russia and the Middle East. Turkey, one of the largest issuers in the region, made extensive use of both currencies.

In this segment, as indicated by information published in the *International Financing Review*, euro-denominated issues were clearly targeted at European investors, including from the euro area, while US dollar-denominated issues were targeted at investors both from the United States and Europe (and apparently not at Asian investors, which were probably less focused on this region). Indeed, borrowers increased the number of advertising events in the euro area, such as roadshows, to address the variety of languages and market segmentation in Europe.[32] Lead managers were dominated by European banks while, as previously mentioned, a large share of the bonds was sold to European investors on the primary market.

Retail customers, together with banks which probably purchased at least part of the securities to sell them to their retail customers, accounted for a relatively high share (55-60%) of the demand for euro-denominated issues. This compares with only 30% for US dollar-denominated bonds and notes issued in the same region. As US-based investors are not expected to purchase euro-denominated securities in the primary market, it seems that borrowers decided to avoid the high costs of compliance with US regulations (notably rule 144A of the US Securities Act of 1933).

32 *Euro-denominated bonds were practically not advertised to the US public. By contrast, US dollar-denominated bonds were equally advertised both in the United States and in Europe.*

Box 4

Euro-denominated benchmarks in emerging markets

The euro plays only a limited role in the overall market for emerging market bonds. Euro-denominated benchmarks do exist, but they represent a small share of market activity.[1] According to data from the Emerging Markets Trade Association's (EMTA) *Second Quarter 2002 Debt Trading Volume Survey*, 87 benchmark international bonds can be identified, originating from 19 emerging markets. These 87 benchmark bonds accounted for a traded volume of about USD 178 billion in the second quarter of 2002, i.e. close to 60% of the emerging market international bond turnover. Of the 87 benchmarks, only eight were denominated in euro, the rest being denominated in US dollars. The eight benchmarks denominated in euro accounted for a traded volume of around USD 4 billion in the second quarter of 2002, i.e. about 1% of the emerging market international bond turnover. Interestingly, all top ten eurobonds, in terms of trading volumes in the second quarter of 2002, were US dollar-denominated (the most heavily traded euro-denominated benchmark at that time, Brazil 2012-11%, ranked twelfth). Argentina and Brazil had two benchmarks denominated in euro, while Mexico, Russia, Turkey and Ukraine had one each. Owing to the scarcity of liquid benchmarks, the euro segment can be considered as a "pure" retail market. In fact, IMF staff recently came to the conclusion that, in the aftermath of Argentina's default and the 11 September events, the euro-denominated bond markets were more vulnerable to contagion than the US dollar segment (IMF, 2002). The alleged reason is that demand for euro-denominated bonds mainly came from retail investors. The euro-denominated bond segment of emerging markets was therefore characterised by relatively low turnover and liquidity. According to IMF staff, a retail bond market is particularly vulnerable to financial stress, as retail investors are typically more risk-averse than global investors.

1 *The EMTA considers as benchmarks international bonds with an outstanding amount of above USD 1 billion. The definition of a benchmark may, however, vary depending on the source. Bonds included in JP Morgan's Emerging Markets Bond Index Plus (EMBI+) have a minimum of USD 500 million outstanding. However, in Merrill Lynch's Global Broad Market Plus Index, which also includes instruments from Hong Kong, Singapore, Taiwan and South Korea, the minimum sizes are smaller. For instance, for Hong Kong issues, the minimum requirement is HK$ 500 million (about USD 64 million), while for Singapore issues the minimum is set at S$200 million (about USD 114 million).*

2 The euro in foreign exchange markets

This section gives an overview of the international role of the euro in foreign exchange markets by considering developments related to trading volumes (Sub-section 2.1), the role of the euro as a vehicle currency (Sub-section 2.2) and transaction costs (Sub-section 2.3). Moreover, Sub-section 2.4 focuses on recent developments in the EUR/JPY market. Recent data from the 2001 Triennial survey indicate that the euro's role in global spot trading is similar to that of the Deutsche Mark prior to EMU. However, in particular due to a reduction in euro foreign exchange swap trading, the euro's share in total foreign exchange market activity has decreased since the last 1998 Triennial survey. This reduction can be explained by three factors: the "arithmetic" elimination of legacy currency hedging techniques that used swaps against the US dollar; the elimination of "convergence plays" in the run-up to EMU that were captured by the 1998 Triennial survey; and financial innovation. Furthermore, the euro appears to be used as a vehicle currency in the Nordic countries and a number of countries in central and eastern Europe.[33] Finally, evidence from long time series with a high frequency suggests that, while transaction costs for other currency pairs remained broadly unchanged, spreads on USD/EUR spot transactions have increased. However, there is evidence that this increase can be explained by quoting conventions.

33 *A vehicle currency (B) can be defined as a currency that is used in the foreign exchange market as a means to exchange two other currencies, so that currencies A and C are not exchanged directly (AC) but via B in two transactions (AB and BC). In foreign exchange markets, most transactions between relatively illiquid currencies are effected via vehicle currencies due to lower transaction costs and in order to avoid excess intraday volatility.*

Table A.8

Currency composition of spot foreign exchange trading volume

(%)

	USD [1]	JPY [1]	EUR [1), 2)]	Pro memoria: DEM [3]
1992	79.2	22.1	56.3	53.2
1995	82.2	25.5	55.3	54.3
1998	84.3	26.5	46.7	42.7
2001	84.4	26.0	43.0	-

Sources: BIS (1993, 1996, 1999, 2002) and Detken and Hartmann (2002) (reproduced with the kind permission of Economic Policy).
Notes: This is an amended and extended version of Tables 9 and 10 in Hartmann (1996). Numbers are based on daily averages for April. The horizontal sum of USD, EUR and JPY volumes is larger than 100% of global spot turnover, because for example direct USD/EUR volume is counted twice, once in USD volume and once in EUR volume. If all other currencies were included, then the total would amount to 200% of global turnover.

1) As a percentage of total volume.
2) Excluding trading volume between euro legacy currencies for 1992, 1995 and 1998.
3) As a share of the sum of total volume and eliminated euro legacy currency volume.

2.1 Trading volumes

Every three years, the BIS conducts a comprehensive survey to estimate foreign exchange activity. The last Triennial survey took place in 2001, meaning that very recent data are available for this year's review.

Spot trading

Table A.8 reports US dollar, Japanese yen, "synthetic" euro[34] and Deutsche Mark shares of total global spot turnover for the Triennial surveys of 1992, 1995 and 1998 (BIS, 1993, 1996, 1999). The bottom row reports dollar, yen and euro shares of total global spot turnover as indicated in the latest Triennial survey (BIS, 2002).

In 2001, the euro's share of spot turnover was exactly the same as the 1998 share of the Deutsche Mark, at 43%. Given the convention to account for both sides of each trade, shares add up to 200%, so that the euro's actual share is about one-fifth. This share made the euro the second most important currency in the spot foreign exchange market, clearly behind the US dollar (84%) and also clearly ahead of the yen (26%). The 1998 share of the synthetic euro net of intra-euro area legacy currency trades was only slightly larger, at 46.7%. Therefore, the euro's share in spot market trading is not surprising from the perspective of "simple EMU arithmetic".

Absolute euro spot volume decreased by around one-third, from USD 252 billion to USD 166 billion, broadly in line with the decline in total spot trading that occurred over the same period. The USD 38 billion of spot trading among euro legacy currencies in 1998 accounts for one-fifth of the total spot volume that disappeared. The rest of the decline in total spot trading has been explained by bank consolidation, international corporate sector concentration and the advance of electronic broking (Galati, 2001). Trading in (synthetic or actual) euro remained constant as a proportion of a shrinking spot market.

Swap trading

The picture is different for swaps, the largest segment of the foreign exchange market (Table A.9).[35] The main currencies' shares did not change significantly between 1992 and 1998 (with the exception of the yen in 1998). In the 2001 Triennial survey, however, the euro's share decreased by more than a third in absolute terms from USD 337 billion in 1998 to USD 221 billion in 2001, to less than 34%.[36] This decrease was much larger than

34 The synthetic euro is created by aggregating all legacy currencies but eliminating intra-euro area legacy currency trades.
35 A swap transaction entails two exchanges of currencies: one immediately ("spot") or in the future ("forward") and an opposite trade in the future.
36 As explained earlier, given the convention to account for both sides of each trade, shares add up to 200%. This means that the euro's actual share in swap trading is about 17%.

Table A.9

Currency composition of swap foreign exchange trading volume

(%)

	USD	JPY	EUR	Pro memoria: DEM
1992	96.5	26.0	37.4	22.4
1995	97.1	25.6	43.4	20.5
1998	96.6	16.9	46.5	20.0
2001	95.0	20.2	33.7	-

Sources and notes: same as Table A.8.

that in overall swap turnover, which declined by only 11%, of which only 1.5 percentage points can be explained by the elimination of euro legacy currency turnover. One may note, however, that in contrast to spot markets the absolute euro volume is still much larger than Deutsche Mark volume was before EMU, and that the euro's share of 34% is also 14 percentage points higher than the previous Deutsche Mark share of 20%.

Anecdotal evidence gained from interviews with foreign exchange market participants suggests that three interrelated phenomena may explain why euro swap volume in 2001 was much lower than that of its synthetic legacy counterpart.

First, it is apparent from Table A.9 that almost all foreign exchange swap trading has the US dollar on one side of the transaction, and that hardly any swaps were written directly between two legacy currencies. To hedge the risk of legacy currency positions at the end of the trading day, dealers would usually swap the US dollar against the relevant legacy currencies.[37] To the extent that all swap transactions went through the US dollar, even when intended to hedge exchange rate risk between legacy currencies, the "arithmetic" elimination of legacy currency turnover due to the introduction of the euro would have affected both US dollar and euro volume. However, since the US dollar's share is almost 100%, only the euro's share would decrease through this effect.

Second, trading of USD/EUR legacy currency swaps may have been unusually high at the time of the 1998 Triennial survey. In the run-up to EMU, swaps were widely used in "convergence plays", i.e. bets on the speed of the interest rate convergence across the "in" countries. In fact, countries with the largest initial interest rate differentials experienced the strongest growth in swap turnover among EU countries (excluding Greece). Between 1995 and 1998, swap turnover of both the Irish pound and the Portuguese escudo grew by 154% and that of the Italian lira by 94%, while the whole swap market grew by only 34% (BIS, 1996, 1999).[38] In April 1998, a few days before the final announcement of the euro conversion rates, interest rates in these and other EMU countries still featured significant three-month differentials with Germany, while rates in some other EMU countries had already fully converged. If late convergence plays for specific countries led to a temporary rise of swap trading at the time of the turnover survey, the 1998-2001 decline may be overstated from a longer-run perspective.

Finally, financial innovation may be relevant. A traditional foreign exchange swap is subject to supervisory capital requirements and, to avoid such requirements, continental European banks have recently preferred off-balance-sheet instruments that are not subject to regulatory capital. For example, the same positions that can be taken with foreign exchange swaps can be replicated with interest rate swaps in two countries (such as EONIA swaps newly created in the euro

37 *A particularly popular version of this technique was "tom-next" (tomorrow-next day) funding with a one-day maturity.*

38 *For example, three-month forward discounts against the Deutsche Mark were 2.4% for Ireland, 1.6% for Italy, 0.9% for Portugal and 0.8% for Spain.*

Table A.10

Currency composition of total foreign exchange trading volume

(%)

	USD	JPY	EUR	Pro memoria: DEM
1992	86.7	24.2	47.3	39.0
1995	90.0	26.0	48.5	36.1
1998	90.8	21.6	46.4	29.8
2001	90.4	22.7	37.6	-

Sources and notes: same as Table A.8.

area).[39] Consistent with this explanation, euro- and US dollar-denominated interest rate derivatives turnover in 2001 was almost twice as large as the aggregate of legacy currency turnovers (BIS, 1999, 2002).

Therefore, it is highly likely that "arithmetic" effects were mainly responsible for the fall in euro swap trading and thus for the fall of the euro's share in overall transaction turnover.

Total trading

The results for spot, swap and forward markets (not reported) add up to the totals presented in Table A.10. As explained, the 9 percentage point[40] reduction in the euro's relative share of total global foreign exchange market trading compared with the aggregate of its legacy currencies was in particular a swap market phenomenon.

2.2 Vehicle currency role

Global data show that, in 2001, 98% of total inter-dealer spot volume had the US dollar or the euro on one side of the transactions.[41] Hence, only these two currencies act as a vehicle currency and, at a global level, the USD is used most in this role (84% of trading). This situation closely mirrors that prevailing before EMU with the US dollar and the Deutsche Mark.

Table A.11 breaks down the spot interbank turnover in each trading centre in 1998 and 2001 into the Deutsche Mark's (and subsequently the euro's) and the US dollar's shares. The euro dominates spot interbank trading in the Nordic countries and several central and eastern European countries. In Denmark and Norway, the euro's share increased to 83% and 93% in 2001 compared with 67% and 89% in 1998 and, in Sweden, it remained virtually constant at around 80%. Large euro shares, between 80% and 98%, also stand out in the Czech Republic, Hungary, Slovakia and Slovenia, with a fundamental change occurring in Hungary as it turned from a US dollar-dominated market in 1998 to a euro-dominated market in 2001. Given these high shares, one can be reasonably confident in assuming that the euro is used as a vehicle currency between the respective domestic currencies and some third currencies, in particular other European currencies. Moreover, the data reveal that in trading with European currencies, the euro's role closely resembles that of the Deutsche Mark.

For the remaining countries, the US dollar clearly dominates trading. This is particularly the case for Asia, the Middle East, and North and Latin America; in the broad geographical neighbourhood of the European Union, there are also a few countries that are US dollar-dominated, in particular Russia and perhaps to a lesser extent Turkey. Hence, the US dollar remains the main international vehicle currency at present, while the euro has inherited a regional vehicle currency role from the Deutsche Mark in the Nordic as well as some central and eastern European countries.

39 EONIA stands for euro overnight index average, a standardised measure of the daily overnight deposit rate in the euro area.

40 As already explained, given the convention to account for both sides of each trade, shares add up to 200%. This means that the euro's share actually fell by about 4.5 percentage points.

41 Only spot transactions are relevant for the euro's vehicle role.

Table A.11

Regional roles of the US dollar and the euro/Deutsche Mark in the interbank spot foreign exchange market

(as a % of total interbank spot turnover in the respective country)

	2001			1998		
Region Country	USD Total volume [1]	EUR Total volume [1]	USD/EUR Direct volume	USD Total volume [1]	DEM Total volume [1]	USD/DEM Direct volume
Europe (excl. euro area)						
Western Europe						
Denmark	43.2	83.2	28.4	56.2	66.6	25.8
Norway	71.4	93.4	66.2	62.3	88.9	52.3
Sweden	46.5	78.9	29.8	42.4	80.6	31.9
Switzerland	70.2	49.0	25.9	67.3	59.9	30.1
United Kingdom	83.9	48.8	33.5	75.2	54.0	30.6
Central and eastern Europe						
Czech Republic	39.6	91.3	31.0	24.8	87.1	13.3
Hungary	64.2	86.3	51.9	77.4	55.6	39.8
Russia	99.7	3.8	3.5	96.3	25.8	22.5
Slovak Republic	82.0	80.6	63.0	-	-	-
Slovenia	2.4	97.6	0.0	-	-	-
Turkey	91.7	70.7	62.5	-	-	-
Africa						
South Africa	88.1	25.0	14.3	94.1	24.2	21.6
Latin America						
Brazil	95.6	5.8	1.7	100.0	0.0	0.0
Chile	99.8	2.1	1.9	99.7	3.4	3.3
Middle East						
Bahrain	86.5	35.2	22.3	95.3	23.9	19.4
Saudi Arabia	91.7	39.1	33.6	97.2	30.3	27.8
Asia						
Hong Kong	90.9	34.0	27.8	86.1	39.9	31.1
Japan	89.3	22.9	14.0	88.6	20.0	10.0
Singapore	91.7	32.6	26.4	86.3	35.4	23.0
Thailand	98.2	5.5	4.6	94.0	5.5	3.7
India	97.8	15.5	13.8	95.3	19.0	14.7
Oceania						
Australia	94.2	18.9	14.9	91.5	24.1	18.1

Sources: BIS, national central banks, Detken and Hartmann (2002) (reproduced with the kind permission of Economic Policy).
Notes: - means not available. This table is an updated and extended version of Table 4.2 in Hartmann (1998, p. 83).
1) Includes USD/EUR turnover (USD/DEM prior to 1999). A large part of this turnover usually has the respective local currency on the other side of the transactions.

2.3 Transaction costs

Bid-ask spreads are a widely used measure of foreign exchange market liquidity and transaction costs, which can be important factors in determining the use of currencies in the foreign exchange market.[42] Recently, some evidence of increased euro spreads has been found in short data samples (see Box 5).

To investigate whether this feature is robust and sustained, longer high-frequency data series are needed. Data on traded/tradable foreign exchange bid-ask spreads were obtained from Electronic Broking Services (EBS). The data span the period from February 1997 to February 2002, i.e. from almost two years before the introduction of the euro to more than three years afterwards. Chart A.10 displays traded spreads measured in basis points.[43]

42 See e.g. the various microstructure analyses in Hartmann (1998) and references therein.

43 For each year, ultra-high frequency (second-to-second) quoted and traded bid and ask prices were available for the months of February and August, except for February 2001. For the most recent months (i.e. August 2001 to February 2002), continuous data were available. The spread measure used can be regarded as the most reliable to capture true transaction costs. The absolute spread for each second when a transaction occurred was calculated as the difference between the transacted ask and bid prices. In case the system was hit only by a buy (sell) signal in this second, the spread is calculated by using this price and the latest quoted ask (bid) price or latest transacted price for a seller (buyer)-initiated transaction (whichever is closer in time). Then the absolute spread is divided by the midpoint of the resulting spread measure, and multiplied by 10,000 to express it in basis points. Finally, the unweighted average of these spreads is taken over the respective reporting period.

Box 5

The recent academic debate on USD/EUR spreads in the foreign exchange market

The evolution of spreads in the foreign exchange market has received considerable attention in the recent academic literature.[1] In two papers, Hau, Killeen and Moore (2002 and 2002a, hereafter HKM) show that intraday data[2] indicate that spreads were systematically higher in 1999 for bilateral euro markets than they were in 1998 for bilateral Deutsche Mark markets. Their data also indicate that euro trading volumes during 1999 were lower than volumes in Deutsche Mark during 1998. HKM propose a microstructure explanation based on a change in the degree of "transparency" of the foreign exchange market. EMU reduced the number of currencies in the foreign exchange market as many actively traded currency pairs, like the DEM/USD or the FRF/USD, were consolidated into a single USD/EUR rate. HKM claim that this increased market "transparency" exposes dealers to higher inventory risk. Allegedly, dealers' inventory imbalances are revealed more easily, as they can only be dispersed through a reduced number of trading routes. This may encourage price changes and front running. According to the authors, dealers can only protect themselves against increased inventory risk by quoting larger spreads. These conclusions have been criticised by Portes (2002), as part of the data used by HKM are quoted spreads which are not transactable but are indicative prices that typically tend to be two to three times larger than traded spreads. Furthermore, HKM's dataset is derived from Electronic Broking Services, whose data represent only part of total spot foreign exchange volume and may not be fully representative. Lastly, these data span a relatively short time period. However, using a longer (five-year) high-frequency time series of traded spreads, Detken and Hartmann (2002) find that spreads in basis points are indeed larger for the USD/EUR pair, though not for any other pairs on the spot market. On top of increased market "transparency", several alternative hypotheses have been proposed in the literature to explain this result, such as reduced market-maker competition or increased volatility, but they fail to explain why only the USD/EUR currency pair seems to have been affected. Goodhart et al. (2002), as well as Honohan (2002), suggest that it is simply the definition of the exchange rate that has caused spreads to increase (as a percentage of mid-quote), as they find that absolute spreads on the USD/EUR market have not changed significantly compared with DEM/USD levels.

1 *See, for example, Detken and Hartmann (2000) and ECB (2001).*
2 *The data they used are 21 months (January 1998-August 1999) of indicative bid-ask spreads from the Reuters FXFX page and two months (August 1998 and August 1999) of traded spreads from Electronic Broking Services.*

In the short run, spreads have been quite volatile. From a medium-term perspective, however, the available data give no indication of structural shifts in the spread between the Deutsche Mark/euro and the yen or the Swiss franc. However, in the first two years of EMU, spreads in basis points on USD/EUR trading in EBS were consistently 20% to 50% higher than previously observed spreads in DEM/USD trading. Hence, the data suggest that there has been an increase in the spread for one currency pair, but do not support the idea that euro spreads are systematically higher than Deutsche Mark spreads before EMU. The latter would have been an indicator of a systematic deterioration in euro liquidity and could have potentially been detrimental to the international use of the euro.

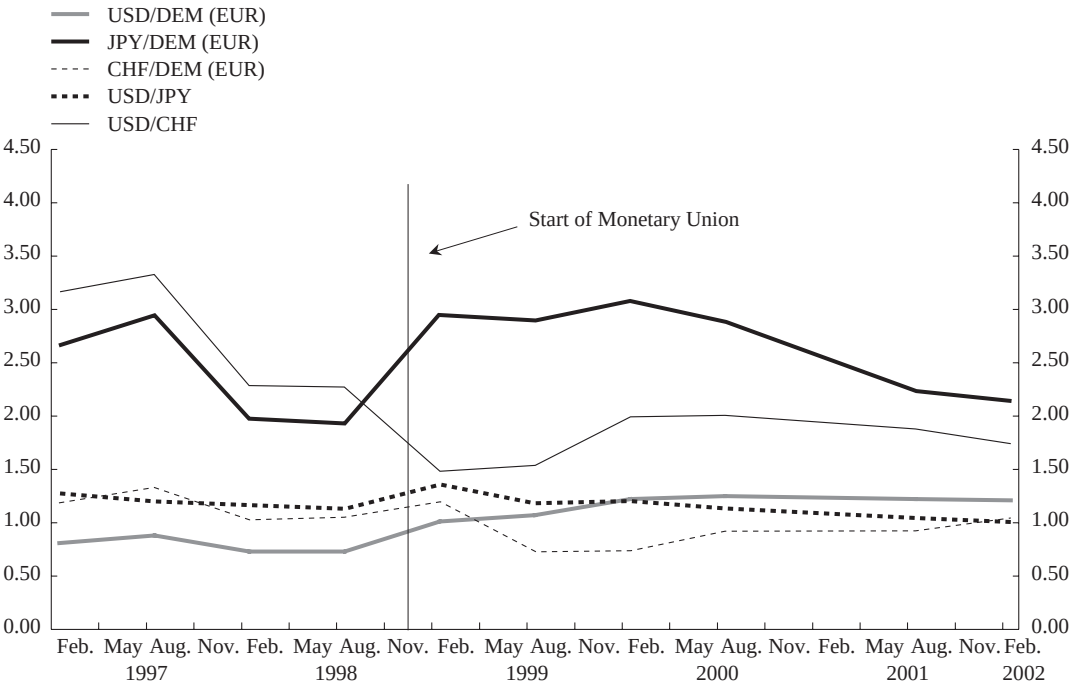
The only market where there has hitherto been a sustained increase in spreads is the USD/EUR market, where spreads rose from 0.7-0.9 basis point to about 1.2 basis points. Nevertheless, this is the largest bilateral foreign exchange market in the world, as was the DEM/USD market prior to EMU. Several explanations have been suggested for this sustained increase, such as the decrease in overall trading volume, a slight rise in inventory management risk or an increased average transaction volume for USD/EUR transactions in EBS. However, they either fail to explain the fact that other currency pairs have not been affected, or cannot account for the magnitude of the increase.

Goodhart et al. (2002) put forward another explanation, the so-called "pip" or

Chart A.10

Traded/tradable spot foreign exchange bid-ask spreads

(in basis points)



Sources: Electronic Broking Services, Detken and Hartmann (2002) (reproduced with the kind permission of Economic Policy).

"granularity" hypothesis. According to this hypothesis, the application of a four-digit quotation convention to USD/EUR trading is responsible for the percentage spread increase through a simple base effect. Previously in DEM/USD trading, a high proportion of spreads was quoted at the minimum of 1 "pip", or one-hundredth of a pfennig per dollar. Inverting the quotation convention to USD/EUR, the smallest possible spread of 1 pip, now one-hundredth of a US dollar cent per euro, is larger in relative terms, i.e. when measured as a percentage of the USD/EUR exchange rate (about 1.17 around the start of Stage Three) compared with the DEM/USD exchange rate (about 1.80 around the start of Stage Three), as 1/1.17 > 1/1.80. According to the "pip" hypothesis, a fifth digit in the quoting convention for the USD/EUR pair could have prevented the rise in bid-ask spreads.

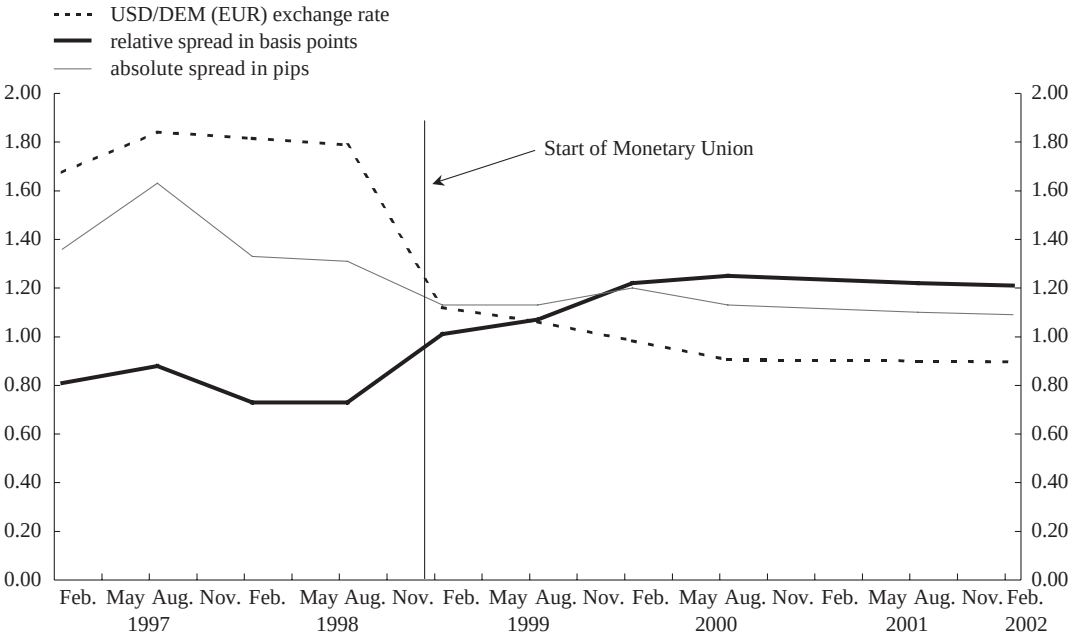
Chart A.11 shows the USD/EUR exchange rate and absolute USD/EUR spreads (in pips) as well as relative USD/EUR spreads (in basis points) over the whole sample period. Following the advent of the euro in 1999, the average absolute spread is now even closer to one pip, the lowest possible spread given foreign exchange dealers' current quoting conventions and the corresponding design of trading software. Furthermore, since the introduction of the euro, the relative USD/EUR spread moved inversely to the exchange rate as the euro was depreciating, so that one pip became an even larger percentage of nominal exchange rates.[44]

In a nutshell, there are plausible explanations (Goodhart et al., 2002; Detken and Hartmann, 2002) suggesting that the increase in USD/EUR spot spreads is caused by a lower bound on absolute bid-ask spreads imposed by quoting conventions, one pip becoming a

44 *In none of the other four spot markets can similar associations between exchange rates and spread size be found. The USD/EUR market stands out in this respect, and the reason seems to lie with the peculiarly changed relationship between the market convention of a minimum spread of one pip and exchange rate levels.*

Chart A.11

USD/DEM (EUR) exchange rate and bid-ask spreads



Sources: Electronic Broking Services, Detken and Hartmann (2002) (reproduced with the kind permission of Economic Policy).

binding constraint, and by the US dollar's appreciation. Since this effect is symmetric for euro and US dollar trading, the increase should in principle have no bearing on the international role of the euro. However, given that the status of the euro and the US dollar in foreign exchange markets is different, the spread increase may be perceived by market participants as being more harmful to the former than the latter.

2.4 Developments in the EUR/JPY market

It has been argued that after the start of Stage Three of EMU, liquidity in the EUR/JPY market declined. In particular, there are signs that the DEM/JPY was an autonomous currency pair, directly quoted by market participants. After the beginning of EMU, the EUR/JPY allegedly became a mere cross-rate, which implies that there was much less direct trade between these two currencies. There are, however, indications that liquidity in this market recovered over the review period.

The analysis is based on the following considerations. Let A, B and C be three currencies traded in a market. When liquidity becomes concentrated on the currency pairs AB and BC, movements in the AB or BC segments evolve independently of each other. This is because foreign exchange dealers tend to specialise in either the AB or the BC segment, which are affected differently by chartists' strategies or released figures. In other words, the currency pairs AB and BC tend to be uncorrelated and become autonomous rates, whereas the exchange rate AC becomes merely a "cross-rate", purely determined by the AB and BC autonomous rates (see Box 6 for further details).[45]

It is possible to discover whether markets perceive an exchange rate to be an autonomous rate or a cross-rate by using option prices.[46] Indeed, markets have

45 Moreover, AC tends to be positively correlated with AB or BC.

46 The use of the "geometry of currencies" dates back to Esposito and Laruccia (1999) who, however, did not directly consider angles, but rather the ratios of volatilities and global hazard indices (these ratios are the sines of the corresponding angles).

Box 6

Geometry of currencies: graphical interpretation

It is possible to present the argument of the main text by depicting the three currency pairs involved – AB, BC and AC – as a triangle, where the crucial element is the angle at currency B. If, for example, the angle at currency B is a right angle (90 degrees), then AB and BC are non-correlated, as in Euclidian geometry, orthogonality is a synonym for non-correlation (Figure 1). Hence, AB and BC are autonomous rates, whereas AC is a cross-rate, determined by AB and BC and positively correlated with them. If the angle at currency B is the same as the angles at currencies A and C (60 degrees), all currency pairs are equally correlated and symmetrical (Figure 2), meaning that none of the rates are cross-rates determined by the other two. Other values for the angle at B are intermediate cases. This approach, called the "geometry of currencies", has been used by dealers in foreign exchange charts since the mid-1990s.

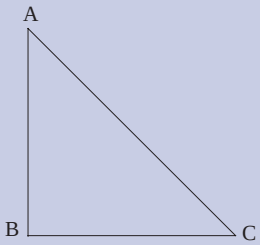


Figure 1

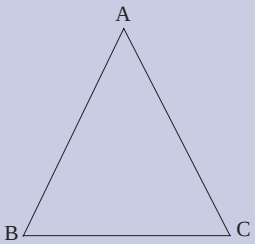


Figure 2

expectations about the volatility of the three currency pairs AB, BC and AC. It can be shown that the correlation between these three pairs is algebraically related to their relative implied volatilities. Therefore, implied correlations between three currency pairs can be calculated from these pairs' implied volatilities and thereafter converted into implied angles between the three currencies.[47]

Implied angles for the euro, the US dollar and the Japanese yen have been calculated from daily implied volatilities on three-month at-the-money options[48] for the three currency pairs USD/DEM(EUR), JPY/USD and DEM(EUR)/JPY between February 1994 and August 2002 (Chart A.12).

Results suggest that from 1994 to 1999 the DEM/JPY's perceived status as an autonomous exchange rate increased steadily. This was particularly the case at the beginning of 1999 as the angle corresponding to the Deutsche Mark (and the euro) was nearly a right angle. At that time, the DEM(EUR)/JPY market was liquid.[49] Between early 1999 and late 2000, however, the EUR/JPY pair very rapidly lost its autonomous status in the foreign exchange markets. In Chart A.12, this loss is reflected by a decrease in the euro's angle to about 30 degrees (for convenience, a trend line has been added to the chart),[50] and the EUR/JPY rate became a cross-rate. Results for the recent period suggest, however, that none of the three pairs seem to be perceived by the market as a pure cross-rate, as revealed by the 60-degree angles that characterise them currently.

47 *Dealers have been aware of the link between implied correlations and implied volatilities since the mid-1990s and strategies aimed at trading implied correlations per se appeared at that time. This approach can be traced back in technical reviews to as early as the mid-1990s, but targeted very much a professional audience. A more accessible presentation of this "geometry of currencies" can be found in Wystup (2001).*

48 *As they are the most liquid and, therefore, relevant in terms of their information content.*

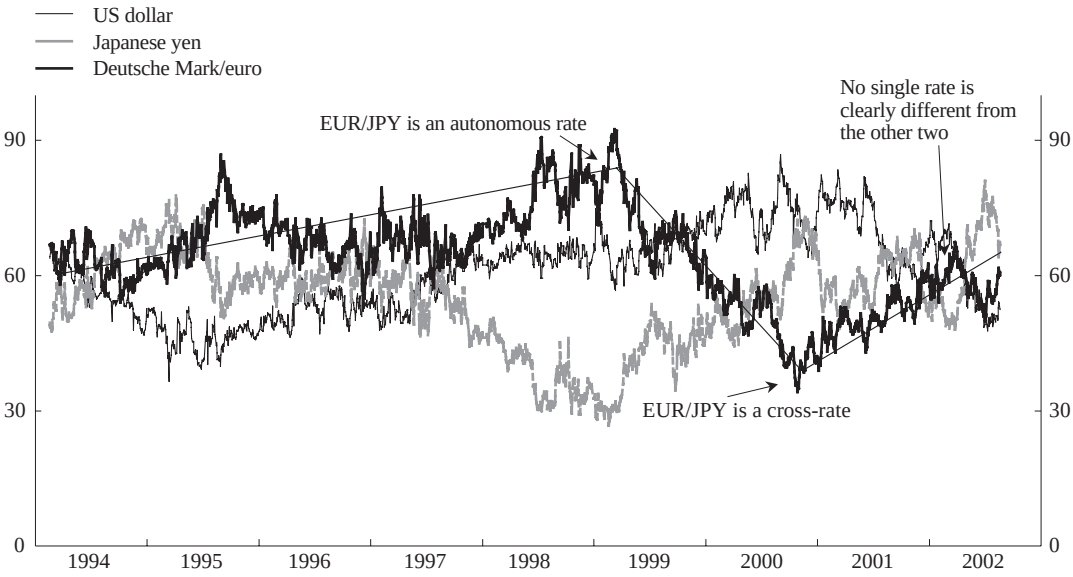
49 *However, the liquidity of the DEM(EUR)/JPY market did not translate into a vehicle role for the Deutsche Mark (euro) between the US dollar and the Japanese yen. Data from the 1998 Triennial survey indicate that spot turnover on the JPY/USD market was still 5-6 times larger than on the DEM/JPY market.*

50 *It is also worth noting that the sample low of the euro's implied angle (reached on 26 October 2000 with 33 degrees) is also the sample low for the USD/EUR exchange rate.*

Chart A.12

Correlations between the EUR/JPY, JPY/USD and USD/EUR as measured by implied angles

(in degrees)



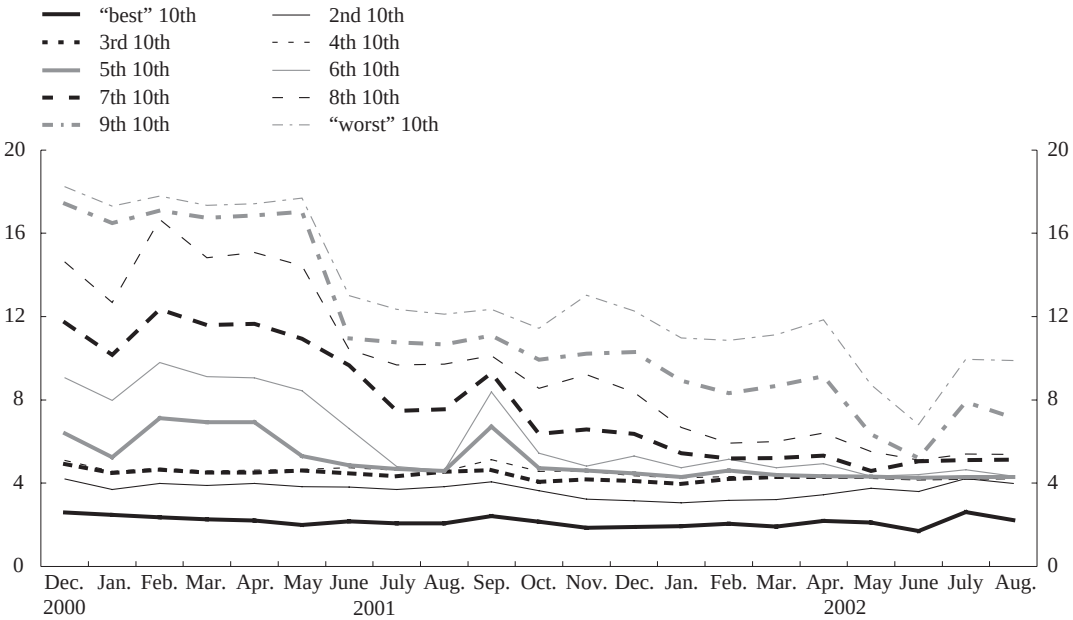
Sources: Deutsche Bank, ECB calculations.

Interestingly, evidence from transaction costs on the EUR/JPY market tends to confirm that liquidity in this market segment has improved over the last 18 months. The distribution of the quoted (contributed) bid-ask spreads on Reuters for the EUR/JPY rate is plotted in Chart A.13. The chart shows the trend over time in quoted spreads ranked by "quality",

Chart A.13

Quantile distribution of the quoted bid-ask spreads on Reuters for the EUR/JPY rate

(in basis points)



Sources: Reuters, ECB calculations.

from the worst (widest) to the best (narrowest) spreads.[51]

Over the last 18 months, it seems that the liquidity of the EUR/JPY pair has improved, this improvement being driven by the "middle class" of the quote contributors. Indeed, while liquidity in the pairs with the narrowest spreads remained unchanged over time, the pairs with the widest spreads saw a marked improvement in liquidity.

3 The euro in international trade in goods and services

Harmonised and aggregated data for the euro area as a whole on the use of the euro for settlement and/or invoicing of international trade in goods and services are not available.[52] Available pieces of information suggest, however, that the use of the euro in the euro area's external trade has increased over the reporting period, to reach a share between 40% and 50%.

A first source of information is balance of payments data for some euro area countries[53] (Belgium and Luxembourg, France, Portugal and Spain) regarding transactions with non-euro area residents. The data reveal that there has been an increase in the use of the euro in transactions with non-euro area residents for both exports and imports of goods in 2001 relative to 2000. Regarding international transactions in services, available

51 Quality means here the frequency of contributions to the Reuters quotation system. Monthly values for each 10th percentile are calculated using daily continuous data from 7 September 2000 to 7 September 2002. The "best" banks are those regularly quoting the EUR/JPY rate (and thereby offering lower spreads); the "worst" banks are those least frequently pricing this exchange rate (and thereby offering higher spreads). These spreads are however not directly compatible with, and are typically larger than, the traded spreads shown in Chart A.10. The spreads depicted in Chart A.13 are computed using indicative prices which do not necessarily relate to completed transactions, unlike the spreads shown in Chart A.10.

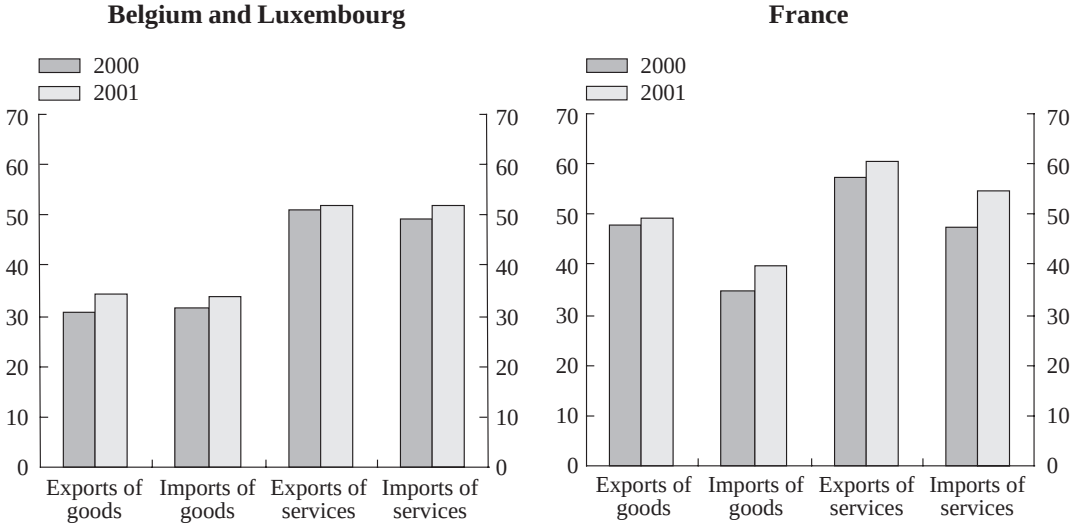
52 Quarterly data published by the European Commission (Quarterly Review of the Use of the Euro) on international transactions of euro area firms, in terms of both value and volume, measured the use of the euro during the transition period 1999-2001, as opposed to both national legacy currencies (DEM, FRF, ITL, etc.) and foreign currencies. Therefore, these data present a distorted picture of the development of the euro's share. Moreover, these data were discontinued in the third quarter of 2001, when the share of the euro (not counting its national legacy currencies) stood at nearly 40% in terms of the number of transactions and 48% in value terms.

53 Statistical evidence exists also for the Netherlands and Greece. In 2000, 48% of Dutch exports of goods and 40% of imports were expressed in euro. For services, the euro's share was somewhat lower (25% of exports and 35% of imports). Owing to a modification of statistical requirements, data were however not available for 2001. Data for 2001 are only available for Greece, where the share of the euro was smaller than in other countries (for goods, 18% of exports and 26% of imports; for services, 8% of exports and 7% of imports).

Chart A.14

Share of the euro in trade of goods and services for Belgium and Luxembourg and France

(%)



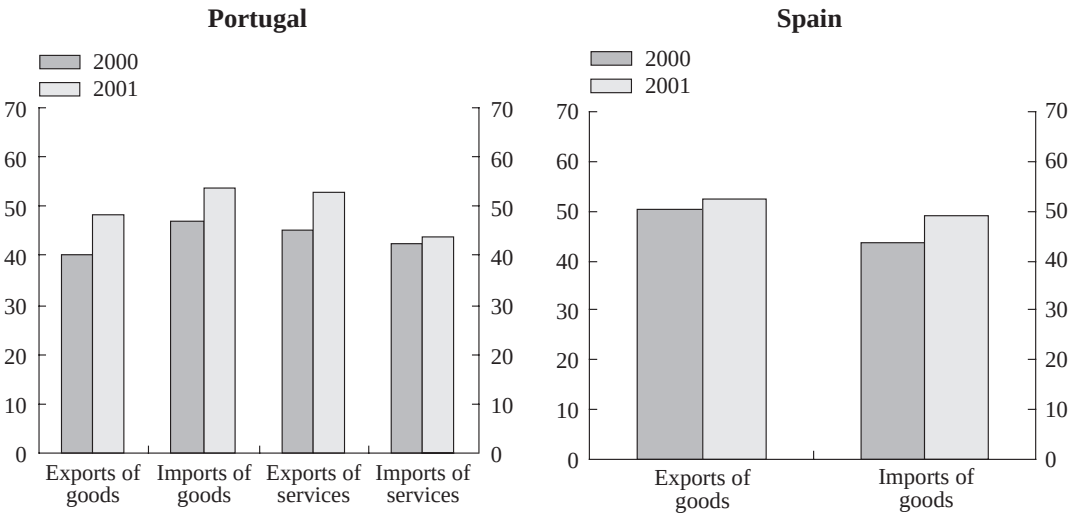
Source: Nationale Bank van België/Banque Nationale de Belgique.

Source: Banque de France.

Chart A.15

Share of the euro in trade of goods and services for Portugal and Spain

(%)



Source: Banco de Portugal.

Source: Banco de España.

data for Belgium and Luxembourg, France and Portugal also indicate a rise in the use of the euro for both exports and imports (Charts A.14 and A.15).

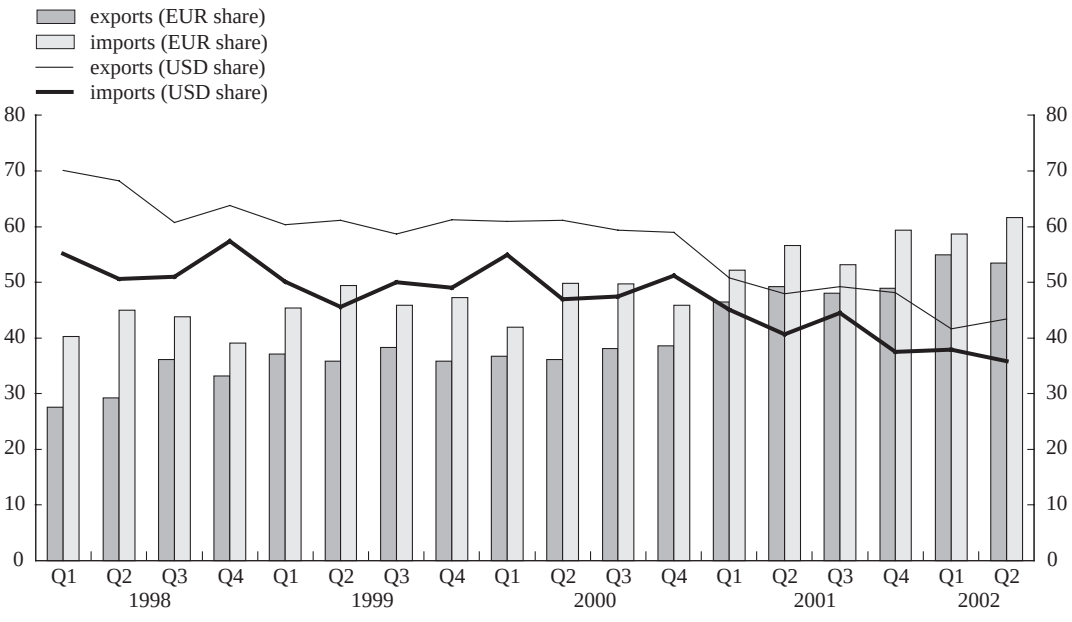
A second source of information is data from third countries on the currency breakdown of their trade. Data are available for trade in goods for two countries in eastern Europe (Bulgaria and Poland) and Japan.[54] Bulgaria and Poland publish quarterly data on the

54 Unfortunately there is to date no equivalent data available for other major trading partners of the euro area, as there is for the United States.

Chart A.16

Share of the euro and the US dollar in the trade of Bulgaria

(%)

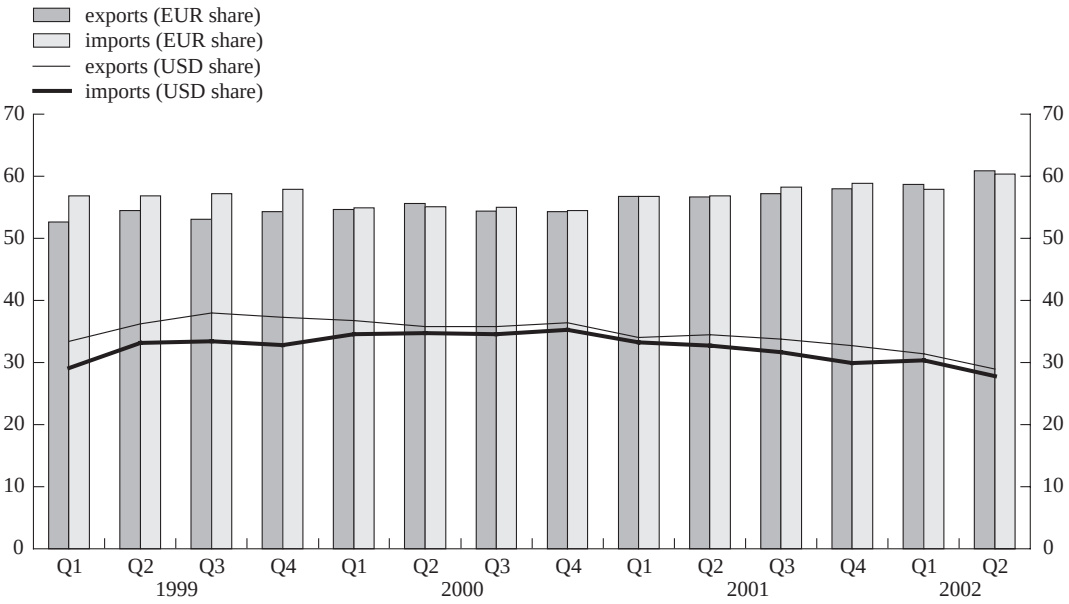


Source: National Bank of Bulgaria.

Chart A.17

Share of the euro and the US dollar in the trade of Poland

(%)



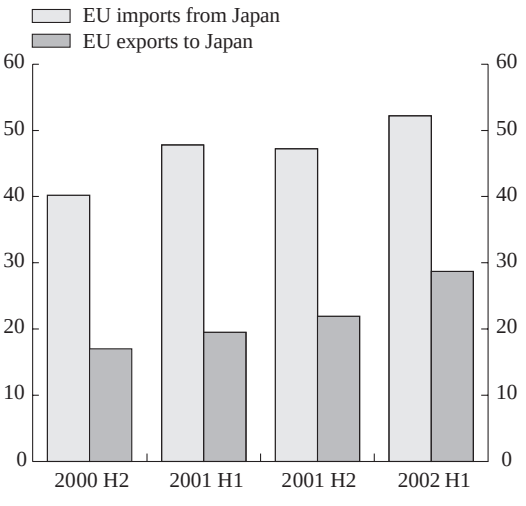
Source: National Bank of Poland.

currency breakdown of their trade, from which it is evident that the euro's share has increased since 1999, at the expense of the US dollar. This trend is stronger in Bulgaria than in Poland.

Chart A.18

Share of the euro in the trade of the European Union with Japan

(%)



Source: Japanese Ministry of Finance.

The Japanese Ministry of Finance publishes biannual data on Japan's trade with the European Union by currency. According to this source, between the second half of 2000 and the first half of 2002, the share of EU imports from Japan denominated in euro increased from 40% to 52%, while the euro's share of EU exports to Japan rose from 18% to 29%.[55] Therefore, both data from Member States as well as from the aforementioned third countries exhibit a marked increase in the use of the euro in international trade.

There is one final consideration about the share of energy and raw materials in euro area imports and exports that may be of interest. The share of energy products (mainly oil and gas) in euro area imports stood between 10% and 15% during 1999-2002. Adding raw materials, the share in euro area imports of products quoted internationally in US dollars increased from 15% to 21%. With regard to exports, this share remained within

55 *This represents an exception to the conventional result (referred to as "Grassmann's law") that, in general, the home currency's share is higher for exports than for imports.*

Table A.12

Share of energy and raw materials in euro area trade in goods

(%)

	1999	2000	2001	2002 H1
Imports				
Energy products	10.0	14.3	13.9	15.7
Raw materials	5.0	4.8	4.6	5.4
Total	15.0	19.1	18.5	21.1
Exports				
Energy products	1.6	2.3	2.1	2.3
Raw materials	2.0	1.9	1.8	2.3
Total	3.6	4.2	3.9	4.6

Source: ECB.

a lower range of 4-5%. While the existence of international pricing standards does not preclude, by itself, the use of another currency for settlement, the euro area's trade in energy and raw materials will probably continue to be both invoiced and settled in US dollars, as long as international prices continue to be expressed in that currency.

B. The euro in third countries

This section reviews the role of the euro in countries outside the euro area ("third countries"), distinguishing between official and private use. The official use mainly refers to the euro's role in third countries' monetary and exchange rate policies, in the form of an anchor or reference currency, a reserve currency or an intervention currency. The private use refers to the use of the euro by private agents in third countries, mainly as a parallel currency to complement the national currency as a tool for accumulating financial assets or in the denomination of specific transactions and contracts.

1 Official use: the euro in third countries' exchange rate policies

1.1 The euro as an anchor currency

Choosing the appropriate exchange rate regime is one of the key policy choices for monetary authorities, with implications also for the size and composition of foreign reserves and interventions. Whereas financial crises in emerging market economies since the mid-1990s have often been seen as a reason to move towards more flexible exchange rates, de jure and de facto many countries continue to see a need for anchoring their domestic currencies, often without resorting to "hard" institutional commitments like currency boards or euroisation/dollarisation regimes.[56] This applies primarily to small, open economies with strong trade or financial links with one larger trading partner or to countries in need of an external anchor for their domestic stabilisation policies.

The IMF lists about 150 countries with exchange rate regimes not classified as independently floating (and thus having an anchor or reference currency). 54 countries[57] outside the euro area involve the euro in their exchange rate regime (Table B.1). Solutions adopted range from euroisation and euro-based currency board arrangements to looser forms of anchoring through peg arrangements based on the euro and managed floating regimes with the euro used as reference currency. For about 35 of these countries, the euro can be considered as the sole anchor or reference currency, while the others use a currency basket that includes the euro. Most of the countries are small economies (and several are even microstates) and their combined GDP amounts to less than 4% of world GDP, or 16% of euro area GDP.

The use of the euro in third countries' exchange rate regimes has a strong geographical and institutional underpinning, with many of these countries being close to the euro area and/or having special institutional arrangements with the European Union. Accession countries and the countries of the western Balkans, northern Africa and the CFA Franc Zone are the main countries using the euro as their sole anchor. Out of the 13 EU candidate countries, only the currencies of the Czech Republic, Poland and Turkey do not have an explicit link to the euro; in the western Balkans, most countries have opted for either hard pegs or managed floating regimes based on the euro. Morocco and Tunisia de facto tightly manage their respective currencies relative to the euro.

In contrast, oil-producing countries that formally peg to the special drawing right (SDR) (Qatar, Saudi Arabia and the United Arab Emirates) peg their currency de facto to the US dollar. The same applies for Kuwait whose undisclosed basket seems to be dominated by the US dollar.

56 *See, for example, Calvo and Reinhardt (2002) and BIS (2002c). De jure exchange rate regimes refer to arrangements as officially declared by countries and classified by the IMF. De facto exchange rate regimes refer to actual unofficial practices of countries and can only be identified econometrically. For an overview of the discussion on exchange rate regimes see Fischer (2001).*

57 *This number also includes the French territorial communities and overseas territories of Saint-Pierre-et-Miquelon, Mayotte, French Polynesia, New Caledonia and Wallis and Futuna, as well as Kosovo, Montenegro and the countries which peg either to the SDR or to a basket of currencies including the euro (see Table B.1).*

Table B.1

Countries with exchange rate regimes linked to the euro

(as at 31 December 2001)

Region	Exchange rate regimes	Countries
European Union (non-euro area)	ERM II	Denmark
	Pro memoria: Independent floating	Sweden, United Kingdom
Accession countries	Euro-based currency boards	Bulgaria, Estonia, Lithuania
	Unilateral shadowing of ERM II	Cyprus, Hungary
	Peg arrangements based on a basket involving the euro	Latvia (SDR) [1)] Malta (euro share: 70%)
	Managed floating with the euro as reference currency	Romania, [2)] Slovak Republic, Slovenia
	Pro memoria: Independent floating	Czech Republic, Poland, Turkey [3)]
Western Balkans	Unilateral euroisation	Kosovo, Montenegro
	Euro-based currency boards	Bosnia and Herzegovina
	Managed floating with the euro as reference currency	Croatia, FYR Macedonia, FR Yugoslavia
Other regions	Euroisation [4)]	European microstates, [5)] French territorial communities [6)]
	Peg arrangements based on the euro	CFA Franc Zone, [7)] French overseas territories, [8)] Cape Verde, Comoros
	Managed floating with the euro as reference currency	Tunisia
	Peg arrangements based on the SDR and other currency baskets involving the euro (share of the euro) [10)]	Israel (21.8%), [9)] Seychelles (31.2%), Botswana, Kuwait, Morocco, Vanuatu, Jordan, Libyan Arab Jamahiriya, Qatar, Saudi Arabia, United Arab Emirates

Sources: IMF, ECB compilation.

1) The SDR is a basket of currencies, including the US dollar, the euro, the Japanese yen and the pound sterling.

2) With an informal reference to a currency basket, involving both the US dollar and the euro.

3) Turkey is a candidate country; however, negotiations for accession have not yet started.

4) In the case of Andorra: unilateral euroisation. The other countries and jurisdictions are entitled to use the euro as the official currency.

5) Republic of San Marino, Vatican City, Principality of Monaco, Andorra.

6) Saint-Pierre-et-Miquelon, Mayotte.

7) West African Economic and Monetary Union (Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo) and Central African Economic and Monetary Community (Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon).

8) French Polynesia, New Caledonia, Wallis and Futuna.

9) Crawling peg with automatically widening band (currently > 40%).

10) Botswana: weighted basket of currencies comprising the SDR and the South African rand. Kuwait: weighted basket of currencies of Kuwait's trade and financial partners. Morocco: weighted basket in accordance with the distribution of Morocco's foreign trade and the pattern of currencies of settlement. Vanuatu: weighted (by trade and tourism receipts) basket of currencies of Vanuatu's major trading partners. Jordan, Qatar, Saudi Arabia and the United Arab Emirates have, in practice, maintained a stable relationship between their domestic currencies and the US dollar. Libya has two exchange rates: the official rate and the special rate. The official rate, at which most transactions, including oil exports, are conducted, has been pegged to the SDR, whereas the special rate is pegged to the US dollar.

The euro is the anchor currency in several countries and regions in the broad geographical neighbourhood of the European Union, namely the western Balkans, the Middle East and North Africa as well as parts of sub-Saharan Africa. In the rest of the world, the euro plays only a very limited role as an anchor currency. It should be stressed that, in all cases, the decision to use the euro as an anchor currency is a unilateral decision which does not involve any commitment from the Eurosystem.

Interestingly, the use of the US dollar in third countries' exchange rate regimes is spread more globally and has less of a regional dimension. While many countries located in the Western Hemisphere either de jure or de facto anchor their currency to the US dollar, such a phenomenon can also be observed in other parts of the world, including Asia and CIS (Commonwealth of Independent States) countries. This feature is in line with the finding highlighted in the first part of this review on global markets that, from a market point of view, the euro can be seen as an international currency with a strong regional focus, whereas the US dollar is used more globally.

Developments in the review period

As the choice of an anchor currency is a fundamental one, changes are usually gradual and rather infrequent. In the period under review, six countries modified the link between their domestic currency and the euro.

- On 2 February 2002, *Lithuania* repegged its currency board from the US dollar to the euro. The move reflects inter alia increasing trade relations with the European Union, a high level of investment from the European Union and the process of EU accession. Overall, there are currently four currency boards based on the euro, compared with three currency boards with the US dollar as the currency of reference.[58]

- In January and May 2001, *Cyprus* and *Hungary* introduced a peg arrangement unilaterally shadowing ERM II by announcing a central parity vis-à-vis the euro with fluctuation bands of ±15%. In doing so, the two countries abandoned a crawling peg to the euro (Hungary) and a conventional peg to the euro (Cyprus).

- In August 2002, the monetary authorities of *Malta* decided to increase the euro's weight in the reference basket for the Maltese currency to 70% (from 57%), and *Morocco* also increased the weight of the euro in its undisclosed currency basket in the course of 2001.

- Finally, after unifying and liberalising the exchange market at the end of 2000, *FR Yugoslavia (Serbia)* has followed a policy of managed floating with the euro as the reference currency.

1.2 The euro as a reserve currency

Global foreign exchange reserves rose by 9.4% during 2001 to reach SDR 1,616.7 billion at year-end.[59] While holdings by industrialised countries were basically stable, emerging

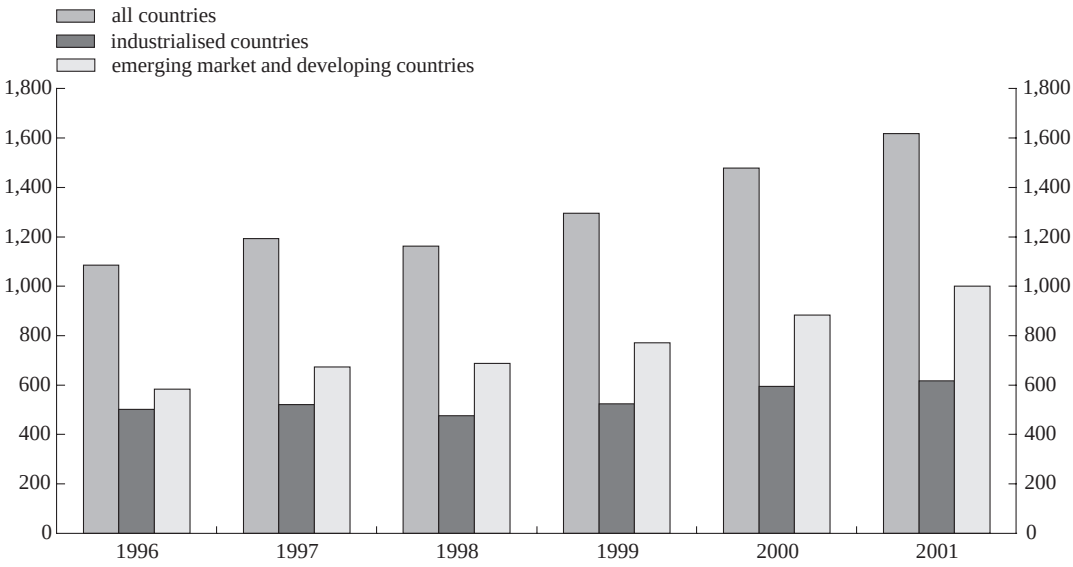
58 The euro-based currency boards are in Bosnia and Herzegovina, Bulgaria, Estonia and Lithuania, while the currency boards of the East Caribbean Currency Union, Hong Kong and Djibouti are linked to the US dollar. The Brunei dollar is linked to the Singapore dollar also under a currency board arrangement.

59 These data are based on the member countries of the IMF. It should be recalled that on 1 January 2001 the valuation of international reserves was affected by the adoption of a new valuation method for the SDR. The SDR basket traditionally comprised five currencies of individual countries, including the Deutsche Mark and the French franc, and the weight of each currency in the basket was determined on the basis of trade and financial data of these countries. At the start of Stage Three of EMU the Deutsche Mark and the French franc components were replaced by equivalent amounts of euro. However, the criteria for selecting component currencies and assigning weights continued to be based on individual country indicators. Consequently, the weight of the euro component in the SDR basket reflected only the economic weight of Germany and France. On the contrary, effective from 1 January 2001 the weight of the euro in the SDR basket (29%) was based on the importance of the euro area as a single economic entity (similarly, on the same date the EURIBOR replaced the German and French national interest rates in the determination of the SDR's interest rate). Hence, the amount of euro in the SDR valuation basket is €0.426. Since the values of the amounts of each currency fluctuate along with the exchange rate, the euro's share in the SDR fluctuates as well, at around 30% over the review period.

Chart B.1

Global foreign exchange reserves

(SDR billions)



Source: IMF (2002a).

market and developing countries continued to rapidly accumulate reserves, leading to a rise in their share of global foreign exchange reserves to almost 62% (Chart B.1).

About 13% of global foreign exchange reserves at end-2001 were denominated in euro, compared with 68% in US dollars and 5% in Japanese yen (Table B.2). Compared

Table B.2

Share of national currencies in total identified official holdings of foreign exchange reserves

(end-of-year percentages)

	1999	2000	2001
All countries			
US dollar	68.4	68.1	68.3
Euro	12.7	13.0	13.0
Japanese yen	5.5	5.2	4.9
Pound sterling	4.0	3.9	4.0
Swiss franc	0.7	0.7	0.7
Industrialised countries			
US dollar	73.5	73.3	74.5
Euro	10.7	10.4	9.7
Japanese yen	6.5	6.3	5.5
Pound sterling	2.3	2.0	1.8
Swiss franc	0.1	0.2	0.4
Emerging market and developing countries			
US dollar	64.6	64.2	64.1
Euro	14.2	15.0	15.3
Japanese yen	4.7	4.4	4.5
Pound sterling	5.3	5.2	5.5
Swiss franc	1.1	1.0	0.9

Source: IMF (2002a).
Note: Remaining shares are attributable to other currencies.

Table B.3

Currency breakdown of total foreign exchange reserves of selected countries

(%, June 2002)

Country	Euro	USD	Yen	Other
G20 countries				
Australia	37	42	8	13 [1]
Canada	39	58	3	0
United Kingdom	53	32	15	0
United States	51	0	49	0
Other countries				
Croatia	66	32	-	2 [2]
Latvia	36	51	3	0
Slovakia	59	31	2	8 [1]

Sources: Country authorities' websites as posted at http://dsbb.imf.org/ediscird.htm, ECB calculations.
1) Including SDRs and gold.
2) Including JPY holdings.

with 2000, the share of the euro remained stable, while that of the US dollar increased somewhat and that of the yen declined.

For industrialised countries, the share of the euro in foreign reserves declined from 10.4% at end-2000 to 9.7% at end-2001. As for emerging market and developing countries, the weight of the euro in foreign exchange reserves increased slightly to 15.3%.

The authorities of some countries publish the composition of their international reserves on their websites.[60] These countries are Australia, Canada, Croatia, Latvia, Slovakia, the United Kingdom and the United States (Table B.3). The data show that:

- euro-denominated assets account for almost two-thirds of reserves in the two countries neighbouring the European Union (Croatia and Slovakia);[61]

- the share of euro-denominated assets increased in the review period in Canada and the United Kingdom, reaching 39% (up from 32% in December 2001) and 53% (up from 38% in December 2000) respectively in the summer of 2002; and

- the United States holds about 50% of its reserves in euro, and Australia 37%.

A country breakdown for the currency composition of the official reserves of other countries is not available. More recently, however, there have been various press reports and official statements from several countries, including China, Korea, Russia, Pakistan, Romania and others, suggesting that these countries have increased the share of euro-denominated foreign exchange in total reserves or intended to do so. Moreover, in the second quarter of 2002, some central banks holding large reserves, e.g. the Bank of Korea, explained the rise of their foreign reserves with reference to the appreciation of the euro vis-à-vis the US dollar over the same period. This suggests that these countries hold a non-negligible share of their foreign reserves in the form of euro-denominated assets.

1.3 The euro as an intervention currency

The functions of anchor, reserve and intervention currency are intricately intertwined. Countries defending an exchange rate parity tend to use the currency of reference for intervention purposes.[62] However, some third currencies (mainly the US dollar) are also often used given the highly liquid markets for these currencies.

60 See country authorities' websites as posted at http://dsbb.imf.org/ediscird.htm.
61 Latvia's exchange rate regime is characterised by a peg to the SDR, explaining the fact that the euro share is only 36%.
62 The oil-producing countries that formally peg to the SDR (Qatar, Saudi Arabia and the United Arab Emirates) use the US dollar as an intervention currency (IMF, 2001).

Given that information on interventions, in particular with regard to the currency composition, is in most cases strictly confidential, little general information is available on the euro's role as an intervention currency. Focusing on those countries that use the euro as an anchor currency, press reports and publicly available statements by selected national central banks indicate that several accession country central banks, including those of the Czech Republic, Slovakia and Slovenia, intervened with the purpose of stabilising the exchange rate of the respective currencies against the euro in the period under review. Moreover, Hungary announced publicly that in the future it would only intervene in euro (but it did not intervene over the review period). Finally, the authorities of some western Balkan countries, including Croatia, FR Yugoslavia and FYR Macedonia, were active in the foreign exchange market to influence the value of their exchange rates vis-à-vis the euro.

2 Private use: the euro as a parallel currency in third countries

In many developing and transition economies, residents hold a significant share of their financial assets in the form of foreign currency-denominated assets, mostly in foreign cash or foreign currency-denominated bank deposits.[63] Such holdings can generally arise from portfolio diversification, but in most of the developing and transition countries concerned, they are the specific consequence of a lack of confidence in the national currency and/or the national banking system as a result of losses of purchasing power and/or banking crises. In countries with a significant share of foreign currency holdings, the foreign currency is often also used for the denomination of (mostly large-value) contracts and transactions.

The private use of a foreign currency can have significant implications for the authorities concerned: it may affect the effectiveness of their monetary policy, have implications for financial stability or imply significant redistribution effects linked to exchange rate fluctuations. Under some circumstances, changes in the use of foreign currency are also an indicator for the evolution of confidence in the national currency and/or the banking system and can thus provide useful information about the credibility of domestic policies.

The use of a foreign currency parallel to a domestic currency is often referred to as unofficial dollarisation, because – since the 1980s in some Latin American countries – the US dollar has been the main foreign currency used. However, parallel currency use can also be found for other currencies, in particular the euro. Therefore, holdings of euro banknotes outside the euro area and of euro-denominated deposits in banking systems also outside the euro area constitute a relevant aspect of the international role of the euro.[64] Moreover, the introduction of euro banknotes at the beginning of 2002 provided a unique opportunity to measure the role of the euro as a parallel currency outside the euro area.[65]

2.1 Currency substitution – the use of euro cash outside the euro area

The use of euro cash abroad is a consequence of the previous use of some of the legacy currencies abroad. In particular, the Deutsche Mark was used extensively outside Germany,

63 *See Baliño, Bennett and Borensztein (1999), and Honohan and Shi (2002) for an overview of cases and policy implications.*

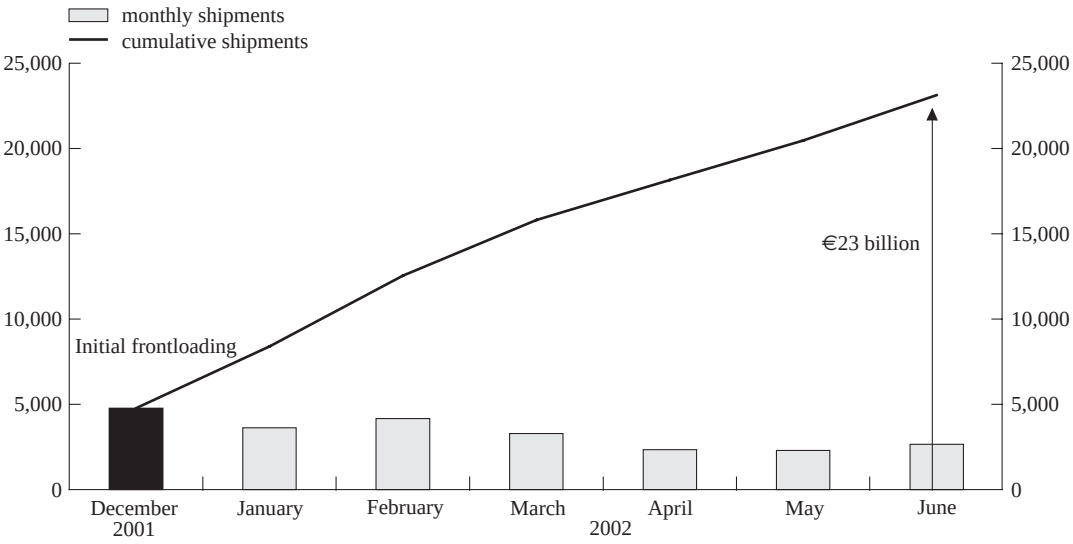
64 *The importance of the use of the euro as a parallel currency within the international role of the euro has recently been highlighted by academic and financial market economists in a hearing before the European Parliament (see De Boissieu, 2002, and Walter, 2002). Some observers also identified this dimension of the international role of the euro as a factor explaining the depreciation of the euro vis-à-vis the US dollar in 1999/2000, arguing that holders of DEM banknotes in eastern Europe had massively switched to banknotes denominated in other non-legacy currencies, allegedly due to a lack of information on changeover operations and uncertainty about the future value of their holdings (see Sinn and Westermann, 2001, and Seitz and Bindseil, 2001).*

65 *See Padoa-Schioppa (2002).*

Chart B.2

Net shipments [1] of euro banknotes to destinations outside the euro area

(€ millions)



Source: Eurosystem.

1) Net shipments = euro banknotes sent abroad minus euro banknotes received.

mainly in central and eastern Europe. Around one-third of DEM banknotes, equivalent to €32-45 billion, were estimated to circulate outside Germany.[66] There were also indications suggesting that the French franc circulated in parts of northern and western Africa, while the Austrian schilling was used in some eastern European countries neighbouring Austria.[67] The total amount of legacy currency that was held abroad is, however, unknown given the many unrecorded channels through which banknotes can flow out of the country of issuance.

With the introduction of euro banknotes from 1 January 2002, all legacy currency banknotes and coins had to be replaced. Countries outside the euro area also had to be provided with euro banknotes. Shipments by banks of euro banknotes to destinations outside the euro area, initially conducted with the help of the national central banks of the Eurosystem, have most likely been the main channel for euro banknote outflows so far.[68] According to available information, cumulative net shipments to destinations outside the euro area – including the initial amount supplied during the so-called "frontloading" period in December 2001 aimed at meeting first cash needs – amounted to roughly €23 billion by end-June 2002 (Chart B.2).[69] This represents around 8% of the total amount of euro currency in circulation.

As far as destinations are concerned, the available information on the frontloading confirms that eastern Europe, including the western Balkans and Turkey – two regions where the circulation of legacy currencies was presumably large –, received more than half of the frontloaded banknotes (Table B.4). Large amounts were also transferred to North Africa and to international banks based in industrialised countries (e.g. Switzerland and the United Kingdom).

66 *See Seitz (1995).*

67 *See, for example, Stix (2001).*

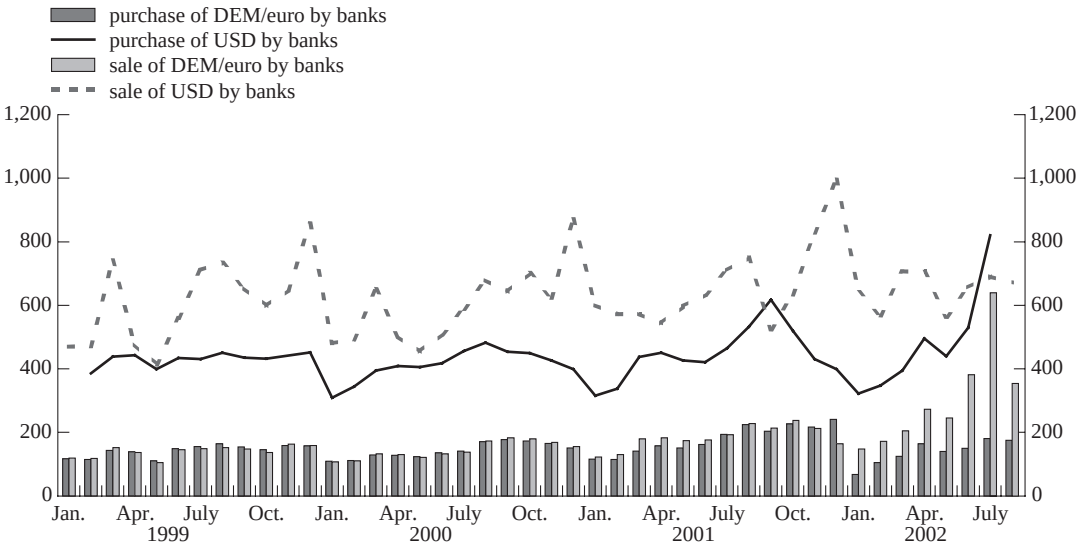
68 *As the initial supply of euro banknotes abroad within the framework of the frontloading during December 2001 was entirely channelled through central banks and commercial banks, the initial amount of banknotes that foreigners received was meticulously captured in data on euro area banks' banknote shipments. After the frontloading period, from 1 January 2002 onwards, there have been additional shipments of banknotes by banks. However, as time goes by, data on banknote shipments by banks will become less and less reliable as a measure of the foreign circulation of the euro.*

69 *The information has been compiled in co-operation with the national central banks of the Eurosystem.*

Chart B.3

Volume of cash transactions in US dollars and euro in Russia [1)]

(USD millions)



Sources: Central Bank of Russia, ECB calculations.
Note: Bank purchase = customer sale, bank sale = customer purchase.
1) Between authorised banks and individuals.

Press reports from several countries suggest that demand for euro banknotes outside the euro area continues to be strong. Developments in monthly net shipments of euro banknotes confirms this impression, as in the second quarter of 2002 outflows amounted to roughly €2.5 billion per month. In this respect, an interesting piece of information has been provided by the Central Bank of Russia, which publishes data on foreign exchange cash transactions by authorised banks. In Russia, the US dollar has been the dominant foreign currency, accounting for roughly two-thirds of total foreign exchange cash transactions by banks up until end-2001. However, since early 2002 customers' purchases of euro have steadily increased and in mid-2002 approached the level of USD purchases (Chart B.3).

2.2 Asset substitution – the use of euro-denominated bank deposits

Comparing the cumulative shipments with the estimates of euro legacy currency (Deutsche Mark) circulation abroad points to a gap of at least €10 billion. This gap can be explained by the fact that several countries, in particular

Table B.4

Frontloading of euro banknotes outside the euro area

(December 2001)

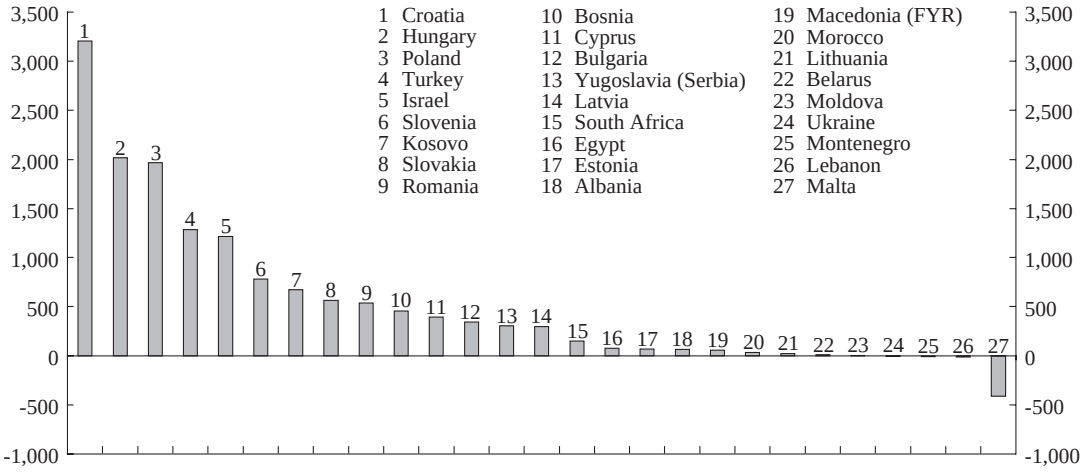
Destination	€ millions	Share (%)
Turkey	1,502	38.5
Industrialised countries	1,273	32.7
Western Balkans	529	13.6
Northern Africa	436	11.2
Accession countries	121	3.1
Sub-Saharan Africa	25	0.6
Commonwealth of Independent States	11	0.3
Total	3,897	100.0

Sources: National central banks of the Eurosystem, ECB calculations.

Chart B.4

Changes in euro-denominated bank deposits

(December 2001 vs. December 2000, EUR millions)



Sources: Respective central banks and ECB calculations.
Note: For Hungary and Slovakia: Dec. 2001 vs. June 2001.

in south-eastern Europe, encouraged households to deposit "under the mattress" legacy currency cash holdings in banks rather than exchange them directly for new euro banknotes. This strategy was intended to boost confidence in banking systems which, in some countries, had a weak reputation after years of mismanagement and crises. Moreover, individuals could minimise risks (e.g. of receiving counterfeits) and costs by depositing their holdings in the local banks.

Indeed, euro-denominated bank deposits rose significantly in the months preceding the cash changeover. In 28 countries surveyed by the ECB, total euro-denominated deposits rose by €13.5 billion,[70] thereby effectively closing the gap between shipments and earlier estimates of euro legacy currency holdings.[71] Again, similar to data on frontloading, the increase was particularly pronounced in countries in the broad geographical neighbourhood of the European Union, with the bulk of the increase taking place in Croatia, Hungary, Poland, Turkey and Israel (Chart B.4).

In terms of regions, the countries of former Yugoslavia experienced the largest increase in euro-denominated deposits in 2001, rising by more than 80% (€4.4 billion). Accession countries follow with an increase of roughly 50% (€4.0 billion). In other transition countries (e.g. Belarus, Moldova and Ukraine) euro-denominated deposits were rather stable, whereas in a group of countries consisting of Turkey, South Africa, Egypt, Israel and Morocco euro deposits were almost 16% (€2.8 billion) higher than a year before. As a result, the cash changeover was accompanied by a considerable rise in euro-based asset substitution.

70 *The following 28 countries or territories participated in the data collection campaign: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, the Czech Republic (data available only from January 2002 onwards), Egypt, Estonia, Hungary, Israel, Kosovo, Latvia, Lebanon, Lithuania, the Federal Republic of Yugoslavia, the Former Yugoslav Republic of Macedonia, Malta, Moldova, Montenegro, Morocco, Poland, Romania, Slovakia, Slovenia, South Africa, Turkey and Ukraine. Their co-operation is gratefully acknowledged. The ECB also obtained data from a number of industrialised economies neighbouring the euro area (e.g. Iceland, Norway, Switzerland), which are disregarded in this sub-section, as developments in these countries are likely to be explained by reasons very different from those relevant for the first group of countries or territories.*

71 *The estimate should be taken as a proxy for the total amount of legacy currency banknotes in circulation outside the euro area which were deposited in euro-denominated accounts. On the one hand, data are missing for a few relevant countries, suggesting a possible underestimate. On the other hand, the surge in euro-denominated deposits may result from the granting of euro-denominated loans and reflect a share thereof which has been deposited, suggesting a possible overestimate.*

Table B.5

Outstanding euro-denominated bank deposits in selected countries [1)]

	Absolute values (€ millions)	As a % of total deposits	As a % of foreign deposits
Turkey	12,776	15.6	28.0
Croatia	8,116	72.3	82.6
Israel	6,451	4.5	15.3
Poland	4,571	5.3	31.5
Czech Republic	3,522	7.4	50.9
Hungary	3,029	11.2	41.0
Slovenia	3,006	37.9	83.6
Lebanon	1,829	4.0	5.7
Slovakia	1,121	8.5	43.3
Cyprus	1,066	5.0	13.5
Bosnia	839	49.5	82.4
Romania	779	9.3	18.9
Kosovo	748	100.0	100.0
Bulgaria	739	15.3	29.3
Egypt	701	1.2	4.2
Estonia	603	19.2	50.4
Latvia	592	11.6	15.7
Malta	547	6.6	17.7
FR Yugoslavia	304	81.8	87.3
Albania	283	12.3	37.8
South Africa	219	0.4	6.0
Ukraine	101	1.9	5.8
Morocco	85	0.3	35.4
FYR Macedonia	67	6.5	12.3
Montenegro	56	100.0	100.0
Lithuania	47	1.9	4.5
Belarus	26	4.1	7.1
Moldova	6	2.4	5.4
Total	52,232	-	-

Sources: National central banks, ECB calculations.
1) End-December 2001; for the Czech Republic, data refer to end-January 2002.

Overall, the total stock of euro-denominated bank deposits in the countries surveyed stood at €52 billion at end-December 2001, accounting for roughly 25% of foreign currency deposits in these countries. The highest absolute amounts are located in Turkey, Croatia and Israel (Table B.5), whereas the banking systems of the successor states and jurisdictions of former Yugoslavia are the ones with the highest share of euro-denominated deposits. Owing to the cash changeover, the share of euro deposits increased even further in this region, and accounted for more than 65% of total deposits in the respective banking systems. In Croatia, which has by far the largest banking sector of the region, more than 70% of total deposits held at the end of 2001 were denominated in euro. In the accession countries, euro-denominated deposits represented almost 10% of total deposits at the end of 2001. This was roughly one-third of total foreign exchange deposits in the respective banking systems. In the transition countries of the CIS, however, the euro continued to play a marginal role. As in some other countries of Asia and Latin America, asset substitution is quite high, but mainly involves the US dollar.

C. A comparison with the US dollar and other international currencies

This review has taken stock of available information on the use of the euro by non-euro area residents. In many respects, its role has been compared with other international currencies, in particular the US dollar (the leading international currency), the Japanese yen, the British pound and the Swiss franc. In the main segments considered in this review, the market share of the US dollar is on average around 50%, whereas that of the euro mostly ranges between one-quarter and one-third of the respective market. The market share of the yen is between 5% and 20%, while other international currencies do not exceed 5%. With the exception of the Japanese yen, the international role of which has declined in recent years, changes have been very gradual.

A comparison of the euro with the US dollar leads to three observations that may be of interest in explaining some of the existing differences between the respective international roles of the two currencies:

1. The shares of the US dollar and the euro broadly reflect the weight of their respective economies. It is interesting to note that a calculation of the GDP shares of the five countries and areas issuing a currency with international status (Table C.2) leads to a distribution broadly similar to their respective currencies in some of the categories used to measure their international use (Table C.1).[72]

While there is no economic theory linking the overall size of the domestic economy to a currency's international role, such a link may be relevant in practice.[73] For example, a larger domestic market is likely to increase a currency's role as an anchor for third countries or fuel the supply of financial assets from abroad by creating demand for portfolio diversification. Moreover, a link between the size of the economy and the currency's international use may reflect network externalities and economies of scale associated with a large market.

If such a link were indeed relevant, this would have important implications for the longer-term prospects for the euro's international role. Specifically, it would refute expectations of some observers that the euro would "challenge" the dominant international role of the US dollar or that equal roles for the US dollar and the euro would be the relevant long-term equilibrium. Such a link would rather suggest that the current constellation could be, broadly speaking, relatively close to a "steady-state" distribution of international roles of the main currencies. However, some key indicators

72 *These shares, calculated at current exchange rates, can vary with the relative levels of exchange rates.*

73 *There is a strand of literature that links the international role of a currency to the size of its underlying domestic financial market (for details, see Detken and Hartmann, 2000).*

Table C.1

The international role of the euro and other international currencies: some key indicators

(% of total)

	Euro	US dollar	Japanese yen	British pound	Swiss franc
Global debt securities market (2002 Q1)	24.1	45.6	18.8	-	-
Broadly defined international debt securities stock (mid-2002)	38.9	44.5	6.1	-	1.9
Narrowly defined international debt securities stock (mid-2002)	29.0	43.8	12.6	-	4.0
Broadly defined money market instrument flows (2002 Q2)	36.3	38.1	5.1	-	2.8
International bank assets (2002 Q1)	24.0	52.0	10.6	-	-
Holdings in leading fund managers' bond portfolios (mid-2002, *The Economist's* quarterly polls)	28.0	50.0	14.0	5.0	-
Official reserves (all countries) (end-2001)	13.0	68.3	4.9	4.0	0.7
Official reserves (developing countries) (end-2001)	15.3	64.1	4.5	5.5	0.9

Sources: BIS, IMF, ECB.

Table C.2

Gross domestic product of selected OECD countries

(at current prices and exchange rates, 2001)

	Level (€ billions)	Share (%)
United States	10,140	43.3
Euro area	6,810	29.1
Japan	4,620	19.7
United Kingdom	1,600	6.8
Switzerland	270	1.1
Total	23,440	100.0

Sources: OECD, ECB.

(e.g. the currency breakdown of official reserves) currently deviate visibly from the link to GDP shares.

2. *The supply of new euro-denominated bonds and notes outside the euro area is, to an important extent, driven by demand originating in the euro area, whereas the demand for US dollar-denominated bonds and notes issued outside the United States is more evenly spread within and outside the United States.* There are signs that demand for euro-denominated international bonds and notes is heavily influenced by euro area investors. In contrast, international debt securities issued in US dollars attract investors not only in the United States but worldwide, including in Asia, Latin America and Europe. International borrowers have adapted to the fact that euro-denominated international bonds and notes are mainly purchased by euro area investors by issuing them according to modalities (e.g. location of roadshows, existence of selling restrictions) specifically addressing the needs of euro area investors.

3. The US dollar is an international currency that is used worldwide, while the euro is an international currency with a strong regional focus. This difference between the two currencies can be found at almost all the levels reviewed:

- *Capital markets*

Whereas the US dollar is the dominant currency of issuance in most regions of the world, the euro is mainly used as the currency of denomination for international bonds issued by emerging economies geographically closest to the euro area.

- *Foreign exchange markets*

While the US dollar is the main international vehicle currency, the euro inherited a regional vehicle currency role from the Deutsche Mark in the Nordic as well as some central and eastern European countries.

- *Use in third countries*

The US dollar has a global reach as an anchor, reserve and intervention currency, playing a role in exchange rate policies of authorities on several continents, not only in the Western Hemisphere, but also in the CIS and – most importantly – in Asia. In contrast, the official use of the euro is concentrated in countries neighbouring the euro area, like the accession countries, the western Balkans and the Mediterranean region. As Asian countries are the main holders of international reserves, this different status explains the relatively low share of euro-denominated assets in total foreign exchange reserves (Table C.1). Whereas currency and asset substitution based on the US dollar can be observed globally, including in countries with strong economic and financial links with the euro area (e.g. Russia and other CIS countries), the parallel use of the euro is geographically more limited. This can mainly be observed in countries neighbouring the euro area, with a special focus on the countries of the former Yugoslavia.

D. A euro area perspective: monetary policy implications

Since the 2001 review of the international role of the euro and the article entitled "The international role of the euro" published in the August 1999 ECB Monthly Bulletin, the monetary policy assessment of the international use of the euro has remained broadly unchanged. As already stated in the previous reviews, the ECB does not pursue the internationalisation of the euro as an independent policy goal, which implies that it neither fosters nor hinders this process. Rather, it accepts the international role of the euro, as well as that of other key currencies, as being mainly determined by the decisions of market participants in a context of increasing market integration and liberalisation at the international level. Nevertheless, in its endeavours to maintain price stability in the single currency area, the ECB is interested in monitoring developments in the international role of the euro as they may affect the economic context in which monetary policy operates. As foreseen by its monetary policy strategy, the ECB monitors on a regular basis a broad set of monetary and non-monetary indicator variables and evaluates the impact of structural changes or developments, such as those implied by an increasing international role of the euro.

Developments during the review period

From a policy perspective, the main point of interest in the period under review was the question of whether the international role of the euro affected the behaviour of the monetary aggregate M3. In 2001, M3 was corrected for the volatile and strongly growing holdings of negotiable instruments by non-residents. This helped to significantly improve the measurement of this broad monetary aggregate.[74]

In 2001 and 2002, movements in non-residents' holdings of euro legacy currencies and euro banknotes in the run-up to and after the euro cash changeover have influenced monetary developments. The changes were mainly in the movements of currency in circulation (which is a component of M3), as outlined in Section B of this report. In this respect, in the run-up to the euro cash changeover, especially in late 2001, the flowback of euro legacy currencies that had been held abroad, notably in central and eastern Europe and Turkey, might have slightly dampened growth in euro area M3. In the meantime, however, the majority of euro legacy banknotes held abroad before the euro cash changeover seems to have been replaced by euro banknotes. According to balance of payments statistics up to June 2002, around €23 billion of euro banknotes had been shipped abroad. This implies that a large part of the impact on M3 should have vanished by the autumn of 2002.

74 *See the November 2001 ECB Monthly Bulletin, pp. 10-13. It should be noted that the major impact of this distortion of M3 in 2001 stemmed from paper denominated in foreign currencies, i.e. not from the international use of euro-denominated paper.*

Conclusions

This review has taken stock of available information on the international role of the euro and has highlighted developments that occurred over the period from the beginning of 2001 to mid-2002. The findings of the report have shown that the euro is in practically all the main relevant segments the second most widely used international currency, after the US dollar and ahead of the Japanese yen. Moreover, the international role of the euro has continued to grow over the review period, both in global financial markets and in international trade, while it remained broadly unchanged in third countries' exchange rate policies.

Three specific features of the development of the euro's international role emerge from the findings of this year's review.

First, the international role of the euro is growing gradually, thereby supporting the view that the role of international currencies tend to only change slowly, and proving wrong some earlier predictions of a rapid rise of the euro's international role.

Second, the international role of the euro has a strong regional focus, as its use as an international currency is most prominent in countries neighbouring the euro area. This suggests that the international role of the euro may in many areas be complementary to other elements for which distance matters, such as trade and institutional linkages with the European Union. The international role of the euro, for example its role in third countries' exchange rate strategies, is particularly strong in central and eastern Europe and its role in the supply of foreign currency-denominated securities issues is important in regions in the broad geographical vicinity of the euro area. In addition, in the foreign exchange markets, the euro's role as a vehicle currency is confined to countries neighbouring the euro area.

Third, the euro's international role is to an important extent driven by the euro area itself. Especially in international financial markets, a significant share of euro-denominated securities issues are targeted at, and purchased by, euro area investors. This contrasts with the international role of the US dollar which seems to be more strongly driven by demand for US dollar-denominated assets from outside the United States. Therefore, the euro area itself is an important source of growth in the international role of its currency.

Key data sheet

The euro in international debt markets

Share of the euro in:

- world supply of debt securities in 2002 Q1: 24.1% (2000 Q4: 23.6%)
- broadly defined stock of international debt securities in 2002 Q2: 38.9% (2000 Q4: 34.5%)
- narrowly defined stock of international debt securities in 2002 Q2: 29.0% (2000 Q4: 25.9%)
- international bank liabilities in 2002 Q1: 23.8% (2000 Q4: 20.8%)
- broadly defined flow of international bonds and notes in 2002 Q2: 40.5% (2000 Q4: 35.1%)
- broadly defined flow of international money market instruments in 2002 Q2: 36.3% (2000 Q4: 32.4%)
- narrowly defined flow of international bonds and notes in 2002 Q2: 30.9% (2000 Q4: 28.6%)
- narrowly defined flow of international money market instruments in 2002 Q2: 19.6% (2000 Q4: 21.1%)
- international bank assets in 2002 Q1: 24.0% (2000 Q4: 21.9%)
- bond portfolio sample surveyed by *The Economist* in mid-2002: 28% (2000 Q4: 32.0%)
- portfolios of funds under management in the United States and Canada compiled by *Capital Access International* in mid-2002: 0.4% (End-2000: 0.3%)
- portfolios of funds under management in non-euro area Europe compiled by *Capital Access International* in mid-2002: 33.9% (End-2000: 29.7%)
- monthly eurobond turnover reported in TRAX in mid-2002: 57.0% (January 2001: 57.0%)

The euro in foreign exchange markets and trade in goods and services

Share of the euro in:

- total global spot turnover in April 2001: 43.0%* (April 1998: 46.7%*)
- total swap turnover in April 2001: 33.7%* (April 1998: 46.5%*)
- total foreign exchange turnover in April 2001: 37.6%* (April 1998: 46.4%*)
- settlement/invoicing of transactions in goods and services with non-euro area residents of four euro area countries in 2001: 40-60% (2000: 30-50%)

The euro in third countries

- number of countries or territories whose exchange rate regimes were linked to the euro in mid-2002: 54 (Mid-2001: 56)
- share of the euro in global foreign exchange reserves in 2001: 13.0% (2000: 13.0%)
- cumulative net shipments of euro banknotes to destinations outside the euro area at end-June 2002: €23 billion
- total stock of euro-denominated bank deposits in EU neighbouring regions at end-2001: €52.2 billion

* *Given the convention to account for both sides of each trade in foreign exchange markets, percentages add up to 200%, meaning that the euro's actual share in total turnover is half the percentage reported in this key data sheet.*

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