



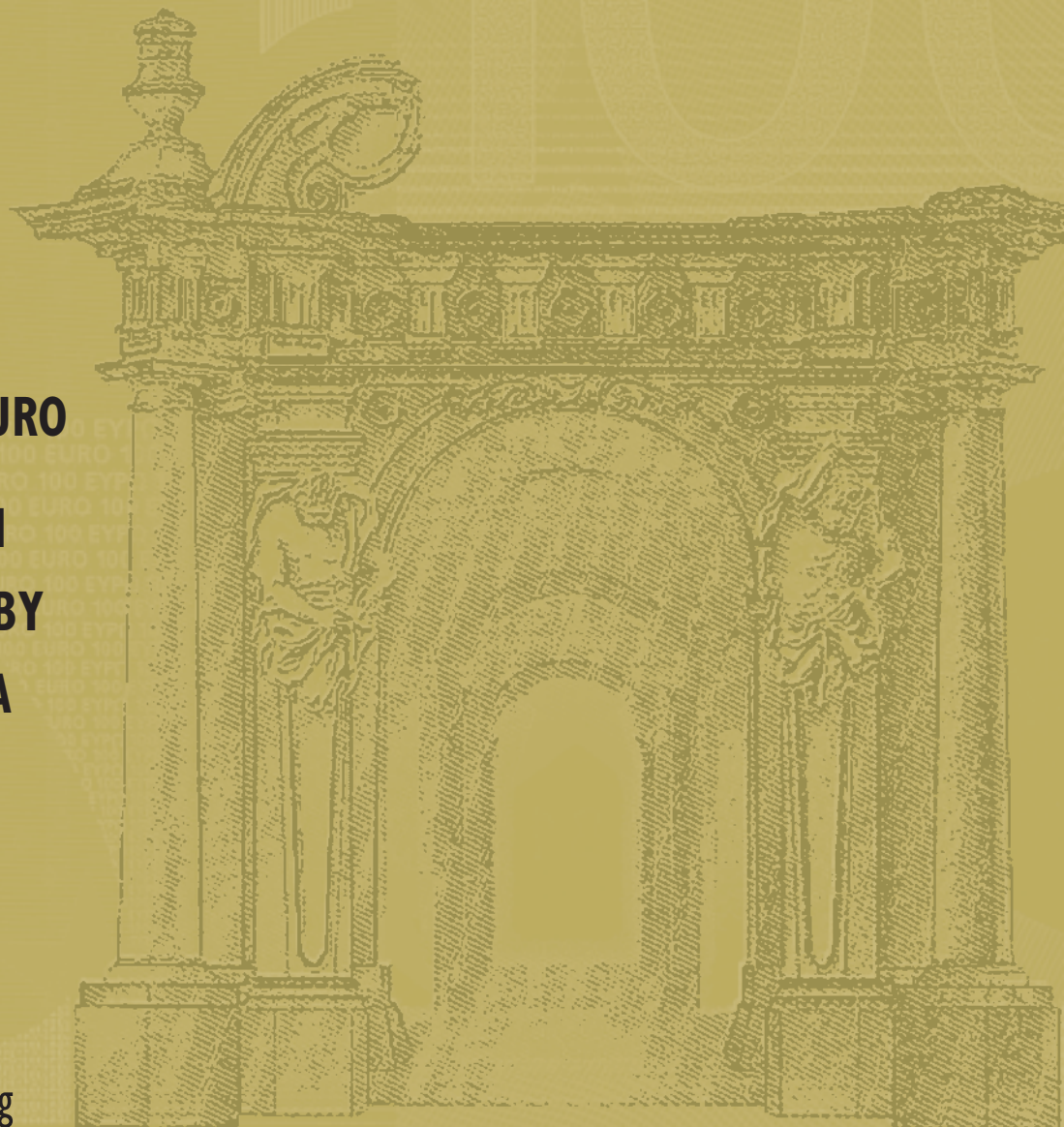
EUROPEAN CENTRAL BANK

OCCASIONAL PAPER SERIES

NO. 18 / JULY 2004

**THE  
INTERNATIONAL  
ROLE OF THE EURO  
EVIDENCE FROM  
BONDS ISSUED BY  
NON-EURO AREA  
RESIDENTS**

by André Geis,  
Arnaud Mehl  
and Stefan Wredenborg





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In 2004 all ECB publications will feature a motif taken from the €100 banknote.

This paper can be downloaded from the ECB's website (<http://www.ecb.int>).

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## I INTRODUCTION

The euro, the single currency of the euro area, also plays a significant role in global markets and countries *outside* the euro area. This use of the euro by non-euro area residents is usually referred to as its international role. Part of this international role was inherited from the legacy currencies, i.e. the 12 currencies that were replaced by the euro, the most important of which was the Deutsche Mark. However, through the creation of a large single economic entity and through an increasing integration of national financial markets in the euro area, Stage Three of Economic and Monetary Union (hereinafter referred to as “Monetary Union”) gave new impetus to the international role of the euro.

Five years after the advent of Monetary Union, non-euro area residents use the euro for a wide array of purposes. For instance, a growing share of the euro area’s external trade is settled or invoiced in euro. Central banks outside the euro area have gradually increased the proportion of their reserves that is denominated in euro. In the western Balkans, households use euro banknotes for large-value retail payments and the bulk of their savings are denominated in euro. Given that the introduction of the single currency was accompanied by further financial market integration within the euro area, it comes as no surprise that, also outside the euro area, non-residents are using the euro for financial purposes. In particular, they are significant issuers of euro-denominated bonds. This represents one of the many facets of the internationalisation of the euro since 1999, which this Occasional Paper endeavours to analyse.

Such a focus is justified for three main reasons. First, this segment of the international financial market is of key *relevance* to the euro’s international role, seen both as a financing and as an investment currency. In the words of Governor Bernanke of the Federal Reserve System, “arguably, the more significant aspects of the euro’s international role arise from the strengthening and expansion of euro-denominated financial markets as these markets

take on a greater international character” (Bernanke, 2004). Indeed, for none of its other facets has the rise in the euro’s international role been clearer than in debt securities issuance (ECB, 2003a), a segment of the international capital markets where perhaps “the most astonishing developments occurred” (Hartmann and Issing, 2002). This importance notwithstanding and issuance trends aside, this particular feature has remained *heavily under-researched*. It is this Occasional Paper’s ambition to provide evidence on the salient features of the market for euro-denominated international bonds, to identify who uses the euro outside the euro area to raise finance, as well as why and how this occurs. More importantly, in the course of the past few years, the ECB has put in the limelight three major traits that characterise how the international role of the euro has unfolded so far. The first is that the euro’s internationalisation has, to some extent, resulted from issuance decisions taken by large private corporations in mature economies outside the euro area. The second of these traits is the strong regional pattern of the euro’s international use, which is most prominent in countries located in the euro area’s immediate vicinity, with the City of London playing an important part in financial market-related activity. As a final trait, the euro area itself has been identified as an important driver of the international role of its currency, as a large proportion of the euro-denominated bonds issued by non-euro area residents has been targeted at, and purchased by, euro area investors. These traits were referred to, in general terms, in recent ECB publications – e.g. in the Monthly Bulletin (ECB, 2003a) and in the annual Review of the international role of the euro (ECB, 2003b) – and in Board Members’ speeches (Domingo Solans, 2003a and 2003b), but not comprehensively. This Occasional Paper presents the *background material underlying these general conclusions* in expanded form, including the methodology and detailed results, which allow them to be substantiated.

In so doing, the paper follows a positive approach, by studying the salient features of the market for euro-denominated bonds issued by non-euro area residents on the basis of a new database which compiles a large amount of empirical evidence that would otherwise not be easily available. Its content differs from the information that is expected to be available in the planned Centralised Securities Database when it starts operating.<sup>1</sup> In particular, the database contains security-by-security information on primary market purchases which has been extracted and classified from articles published in the *International Financing Review*, a specialist magazine. In this respect, it provides entirely new evidence on the role of the euro as, *inter alia*, an international investment currency. Indeed, the data offer qualitative evidence on demand trends, such as the geographical location of investments on the primary market, the type of investors, the existence and location of roadshows, the influence of sales restrictions and the use of currency swaps by issuers. While the paper does not try to identify determinants that have shaped the euro's international role, such as the size of the euro area economy or its price stability record, its contribution lies in analysing, from a particular angle, how this role has unfolded.<sup>2</sup>

In line with the ECB's most recent work (ECB, 2003a and 2003b), it should be recalled up front that the paper focuses on the so-called "narrow" definition of "international", a concept coined in Detken and Hartmann (2000), not least for the sake of comparability. When it comes to debt securities, this means that account is taken only of those issued by residents outside the euro area. In addition to this narrow definition, a "broad" definition exists, whereby the Bank for International Settlements (BIS) also considers a debt security issued by a euro area resident to be "international" if it is targeted at international investors, e.g. through a syndicate of banks comprising non-euro area financial institutions. Admittedly, the "narrow" definition excludes assets commonly considered by financial market participants to

be genuinely international, even if they originate in the euro area. However, the "broad" definition includes those cases where both the issuer and the holder of the securities are resident in the euro area, and thereby purely domestic, even if the issuance was originally intended to be truly "international". Moreover, it may also include bond issues by euro area residents in financial centres located outside the euro area, where taxation rules possibly differ. The use of the "narrow" definition is therefore rather conservative and ensures that the extent of the internationalisation of the euro reviewed here is based on a fully objective criterion, namely the residency.

The rest of the paper is set out as follows. Section 2 recalls previous literature and data sources as general background. Section 3 explains the main methodological aspects of the new database. Based on the latter, the supply side of the market for euro-denominated bonds issued by non-euro area residents is described in Section 4, while the evidence on the demand side is presented in Section 5. Section 6 sets out the conclusions.

1 The Centralised Securities Database is a large security-by-security database currently being developed within the institutional framework of the European System of Central Banks (ESCB) and containing information on issuance characteristics of debt securities (see Israël, 2002).

2 For this alternative approach, see Padoa-Schioppa and Papadia (1984), for instance.

## 2 THE ROLE OF THE EURO IN INTERNATIONAL BOND MARKETS: EARLY DEBATE AND EVIDENCE

### 2.1 EARLY ACADEMIC DEBATE

Modern academic research on the international use of currencies dates back to the early years of the demise of the Bretton Woods system when Cohen (1971) pioneered a milestone distinction between an international currency's private and official use. This distinction builds on the three classical functions of money, namely: (i) store of value, (ii) medium of exchange and (iii) unit of account. Extending this framework to the international sphere implies that households and corporations may resort to a non-domestic currency to (i) invest and raise finance, (ii) exchange two other currencies and (iii) settle or invoice payments of goods and services. Likewise, to conduct exchange rate policy, public authorities may resort to a non-domestic currency to (i) manage their reserves, (ii) intervene in foreign exchange markets and (iii) anchor their own domestic currency.

Literature, however, has rapidly given prominence to the private use. The underlying rationale is that, in sharp contrast to a currency's domestic role, which is guaranteed by sovereign authority and legal tender status, the international role of a currency is essentially market-driven. Indeed, with increasing capital mobility, central bank reserve holdings and interventions are smaller in volume than private transactions in international financial markets and are likely to have less bearing on a currency's international status (Hartmann, 1998).<sup>3</sup>

Within the wide array of products that are traded in international financial markets, bonds play an important role. Together with the international money market, the international bond market, with a volume outstanding of USD 4.9 trillion at the end of 2003, has been recognised as a key component of a currency's international use (see Kenen, 1983; Hakkio, 1993 or Blinder, 1996). In light of Cohen's (1971) framework, the international bond market pertains to both a currency's financing role, which is the issuer's (or supply)

perspective, and to this currency's investment role, which is the purchaser's (or demand) perspective.

Against this background, the run-up to Monetary Union sparked widespread discussions of the euro's future status as a possible challenger to the US dollar, with a particular emphasis on the bond market. Bergsten (1997), for instance, expected a "major diversification of [bond] portfolios into euro, mainly out of dollars" which could "drive the euro up and dollar down substantially". In a similar vein, McCauley (1997) found that the potential growth of the euro-denominated bond market, triggered by a more liquid euro area securities market, would be an important determinant of the euro's "enhanced role in the international financial system" and would attract "more international investment to the euro". Expressing a more agnostic view than Bergsten, McCauley argued further that "liability managers outside the euro area should also find the enhanced liquidity and improved diversification possibilities of euro-denominated debt attractive", so that any impact on the exchange rate would be difficult to forecast. Finally, Portes and Rey (1998) also examined various scenarios on the "speed of internationalisation" of the euro, based on assumptions made on the evolution of transaction costs in bond markets, coupled with synergies with foreign exchange markets.

### 2.2 EARLY EVIDENCE ON THE SUPPLY SIDE

Five years after the introduction of the euro, the evidence available confirms that the increasing role of the euro in the international arena has been most visible in terms of debt securities issuance (ECB, 2003a). Indeed, the share of the euro in the stock of international bonds and notes rose from about one-fifth prior to Monetary Union to close to one-third at the end

<sup>3</sup> Foreign exchange reserves held globally amount to USD 2.4 trillion, while the average daily turnover in the foreign exchange markets in April 2001 was USD 1.2 trillion (ECB, 2003b and 2002).

of 2003 (see Chart 1). In so doing, the euro has become the second currency in the international bond market, behind the US dollar, but ahead of the Japanese yen, whose share has declined steadily since 1999 (see ECB, 1999 and Detken and Hartmann, 2000, for an early analysis of these trends).

Reflecting this growing internationalisation, the share of euro-denominated long-term debt securities issued by non-euro area residents relative to the total amount outstanding of euro-denominated long-term debt securities grew steadily in the first four years of Monetary Union, from about 9% to close to 14% (see Chart 2).

These developments have been explained by efficiency gains brought about by the growing size of the euro area financial markets, supported by the creation of payment and security settlement systems and a unified money market, which have created greater interest in the euro among non-euro area resident borrowers (ECB, 2002 and 2003a). These borrowers can now target investors from an increasingly unified domestic market, thereby benefiting from increased liquidity in comparison with the individual markets of the 12 euro area countries. In addition, Santos and Tsatsaronis (2002) have argued that, prior to Monetary Union, non-euro area resident

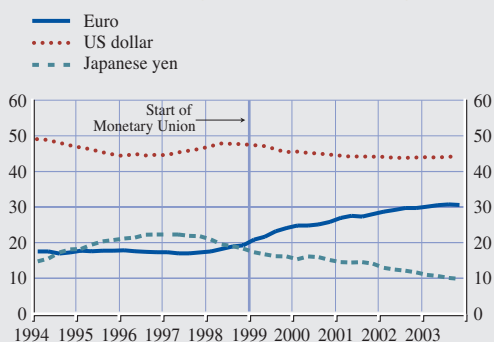
corporate bond underwriters had anticipated the increased attractiveness of a unified domestic demand side in the euro area, and therefore entered the market. This brought down underwriting fees to levels comparable with issuance in US dollars and contributed to the rise in the euro's share. These issuance trends aside, little else has been known. Evidence on who these non-resident borrowers are, why they choose to raise finance in euro and how they issue debt instruments, has hitherto been virtually non-existent.

### 2.3 EARLY EVIDENCE ON THE DEMAND SIDE

The demand side of the market, i.e. who provides finance by purchasing bond issues, is an area where evidence is also scant. Early ECB or ECB staff work (including ECB, 1999, 2001, 2002; Detken and Hartmann, 2000; Hartmann and Issing, 2002), resorted in particular to The Economist's quarterly portfolio polls of eight to nine major global asset managers to gain some insights. These portfolio polls are based on statements and tend to reflect preferences of a group of presumably "truly international" investors, relatively unaffected by home bias, including one to two from the euro area. Interestingly, the picture emerging from these data is bleaker than that on issuance trends. The

**Chart 1 International bonds and notes: currency shares**

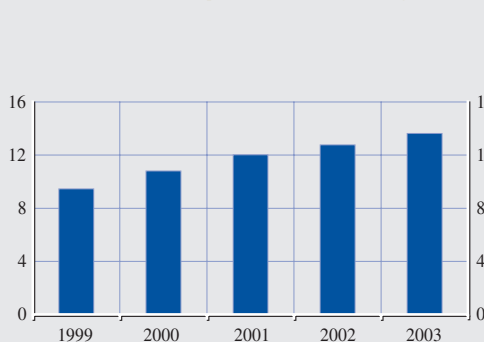
(excluding home currency issuance, as a percentage of the total amount outstanding and at 1994Q1 exchange rates)



Sources: Bank for International Settlements and authors' calculations.

**Chart 2 Amounts outstanding of euro-denominated long-term securities other than shares issued by non-euro area residents**

(as a percentage of total euro-denominated long-term securities other than shares, end-of-period amount outstanding)

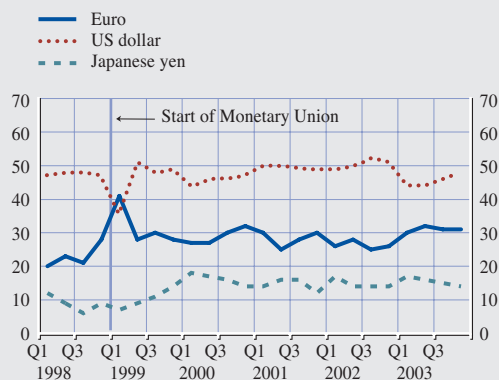


Sources: ECB and authors' calculations.



**Chart 3 Currency shares in the bond portfolios of large fund managers**

(as a percentage of the 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.

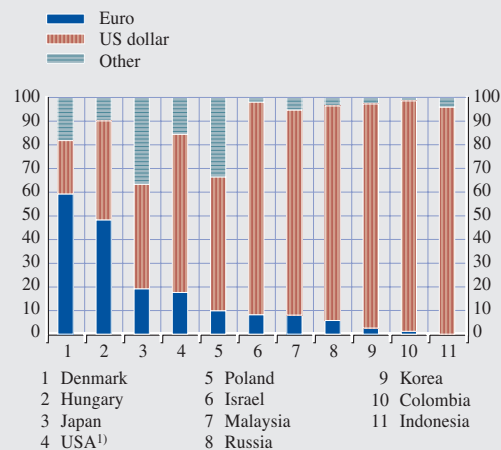
polls suggest that the share of the euro hovered around the same level when it was introduced in 1999, at about 30% (see Chart 3).

This picture, however, may be misleading, as data are subject to severe limitations, not least due to the small size of the sample of asset managers, which may not be representative.<sup>4</sup>

Another source of data on investments in euro-denominated bonds that has recently become available is the IMF's annual co-ordinated portfolio investment survey (CPIS), a survey of external assets held by the private sector in a number of countries. The holdings surveyed include bonds issued by non-resident borrowers, broken down by currency and by country in 2001 and 2002. In the case of the United States, for instance, these data provide information on US residents' holdings of bonds issued by non-US residents in US dollars, euro, Japanese yen, pounds sterling, Swiss francs and other currencies. Similar information can be gained for all other reporting countries. Alongside euro area countries with shares of between 70% and more than 90%, the share of euro-denominated holdings outside the euro area was relatively high only in the bond

**Chart 4 Currency breakdown of long-term debt securities assets in selected non-euro area countries**

(as a percentage of the total, averages over 2001-2002)



Sources: IMF's coordinated portfolio investment survey and authors' calculations.  
1) Data for 2001 only.

portfolios of Danish and Hungarian residents, at close to 60% and 50% respectively (see Chart 4).<sup>5</sup> In other reporting countries, the US dollar plays a dominant role. In the United States and Japan, the share of euro-denominated bonds was below 20%, while it was close to or below 10% in the remaining countries.<sup>6</sup>

4 Moreover, the respective currency shares are simple arithmetic averages, which do not account for the (unpublished) size of the respective investments. Last, and perhaps most importantly, underlying holdings include bonds issued by residents of the respective currency area, and thus go beyond the "narrow" definition of international issuance.

5 Reporting euro area countries include Austria, France, Greece, Italy, Portugal and Spain. However, an important caveat is that, given that their data are not net of intra-euro area holdings, it is not possible to estimate the holdings of euro area residents vis-à-vis non-euro area residents.

6 Given that data do not include bonds issued by residents, the share of euro-denominated bonds in non-euro area countries' overall bond holdings is likely to be even smaller. Evidence in this respect is available for the United States (and Canada) from bond portfolios surveyed in the eMaxx database by Lipper, a financial information provider. These data suggest that, when US dollar-denominated bonds issued by US residents are also taken into account, the euro's share is negligible (ECB, 2002 and 2003b). 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. 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 in a time series. Data refer to euro-denominated bonds issued by non-euro area residents and residents of the euro area alike.

These data are, however, also subject to a number of limitations. They are published with a time lag (typically one year, or even two years for the United States). They are not available for 1999 and 2000, which hampers any analysis of developments since the advent of the euro. Country coverage is limited and varies across years, as reporting is not mandatory. In 2002, for instance, five euro area countries and 18 non-euro area countries reported data, compared with six euro area countries and 17 non-euro area countries in 2001. Finally, when it comes to non-euro area reporting countries, data include bonds issued by both euro area residents and non-euro area residents, thereby going beyond the “narrow” definition of international issuance.

In summary, while the role of the euro in the international bond market was expected and has proved to be instrumental to its overall international status, evidence on supply, beyond issuance trends, has been nonexistent, while that on demand is limited by data insufficiencies. The analysis in the subsequent sections of this Occasional Paper aims at filling these gaps, on the basis of a new database.

## 3 METHODOLOGICAL ASPECTS OF THE NEW DATABASE

### 3.1 DATA SOURCES AND CLASSIFICATION

The database outlined in this paper covers both supply and demand features of the market for euro-denominated bonds issued by non-euro area residents. Standard security-by-security data have been retrieved from Thomson ONE Banker-Deals and Bondware, two existing databases maintained by financial market information providers, Thomson Financial and Dealogic respectively. These data are used to gain information on the main structural features of euro-denominated bonds issued by non-euro area residents on the supply side. These features pertain to (i) the evolution of the type and nationality of issuer and (ii) the main characteristics of the issues (coupon type, maturity at issuance, size, listing exchange, governing law, bookrunner nationality and selling restrictions). They are available on a security-by-security basis for over 3,000 euro-denominated bonds issued by non-euro area residents in the period from January 1999 to December 2003 and account for more than 80% of the quarterly data available from the BIS, suggesting a relatively high coverage (see Table 1).

On the demand side, for about 800 bond issues, new data on primary market purchases have been extracted and classified. These data were produced on the basis of references to articles published in the International Financing Review, a specialist magazine also published by Thomson Financial, as contained in Thomson

ONE Banker-Deals and available on a security-by-security basis. This magazine covers the latest financing trends in bonds, equities, syndicated loans and other markets each week. In concise articles, it reports information gained from (occasionally anonymous) statements by lead managers, brokers, asset managers and other investors on the occasion of primary market sales.

The raw information available is heterogeneous. Depending on the issue, it can be purely qualitative or quantitative, covering a wide array of topics or none. Some of this information, such as the geographical location of primary market purchases, enhances the breadth and scope of the data available from existing sources, such as the quarterly polls of The Economist or the CPIS data, which refer to holdings. A large part is also unique, being more qualitative in nature, including the advertising strategies of lead managers (e.g. via roadshows), the nature of the investor base, or the use of swaps to exchange euro proceeds into another currency. A major challenge, of course, is that the information is spread out in a piecemeal fashion across articles and issues.

Using the references in Thomson ONE Banker-Deals, the 250 issues of the International Financing Review published between January 1999 and December 2003 were systematically screened and the information on euro-denominated bonds issued by non-euro area residents was extracted. Due to data

Table 1 Data coverage

	BIS (EUR billions) <sup>1)</sup>	Thomson ONE Banker-Deals (EUR billions)	Thomson ONE Banker-Deals (as a percentage of BIS)
1999	203.4	162.4	79.8
2000	209.7	179.4	85.5
2001	273.1	214.5	78.5
2002	230.7	181.8	78.8
2003	290.4	249.5	85.9
1999-2003	1207.3	987.5	81.8

Sources: Bank for International Settlements, Thomson Financial – Thomson ONE Banker-Deals and authors' calculations.

1) Converted from US dollar amounts using period-average exchange rates. The same results apply when using ECB data, based on BIS data, as published in Table 4.1 of the ECB Monthly Bulletin.

**Table 2 Overview of the information available from the International Financing Review (IFR) on euro-denominated bonds issued by non-euro area residents**

(January 1999 - December 2003)

	Number of bonds	As a % of all bonds	As a % of all bonds (with relevant information only)
All bonds	3032	100.0	-
<i>of which:</i>			
Bonds referred to in IFR articles	1677	55.3	-
Bonds on which IFR reports relevant information	839	27.7	100.0
<i>of which:</i>			
Information about location of demand	731	24.1	87.1
Information about type of investor	407	13.4	48.5
Information about roadshows	119	3.9	14.2
Information about currency swaps	42	1.4	5.0

Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (all issues between January 1999 and December 2003) and authors' calculations.

unavailability, the coverage, although relatively large, does not extend to the full population of above 3,000 euro-denominated bonds issued by non-euro area residents between 1999 and 2003, as only half are mentioned in one or more issues of the International Financing Review (see Table 2). “Relevant” information, i.e. information which provides evidence on one or some of the features of demand can be found for only a quarter of the overall population, namely some 800 bonds. Availability of information across items is very diverse. Among the 800

bonds for which relevant information is available, close to 90% have indications of the location of demand, almost 50% give an indication of the type of investor, 14% indicate roadshows and only 5% the existence of currency swaps.

For each security, this information has been classified according to four items of interest, namely (i) location of demand, (ii) type of investor, (iii) roadshows and (iv) use of currency swaps. Given its heterogeneity and the

**Table 3 Classification of the information gained from the International Financing Review on euro-denominated bonds issued by non-euro area residents**

(January 1999 - December 2003)

	Number of bonds
<b>Any relevant information</b>	<b>839</b>
<b>About location of demand</b>	<b>731</b>
Bonds with dominant European investor participation	618
Bonds with dominant euro area investor participation	196
Bonds with any UK investor participation	385
Bonds with substantial UK investor participation	84
Bonds with any Swiss investor participation	204
Bonds with substantial Swiss investor participation	8
Bonds with any US investor participation	89
Bonds with any Asian investor participation	113
Bonds with substantial non-European investor participation	54
Bonds with dominant non-European investor participation	6
<b>About type of investor</b>	<b>407</b>
Bonds with dominant institutional investor participation	299
Bonds with dominant retail investor participation	67
<b>About roadshows</b>	<b>119</b>
Bonds with only European roadshows	105
<b>About currency swaps</b>	<b>42</b>

Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (all issues between January 1999 and December 2003) and authors' calculations.

fact that it may not be purely quantitative, the information is encoded, which allows for aggregation across securities and calculation of descriptive statistics. To this end, items are broken further down into sub-items corresponding to the different modalities that the information may take (see Table 3). These sub-items are not mutually exclusive and information reported can be classified as one or several of them. Detailed information on the classification of a particular bond issue as one of the sub-items can be found in the Technical appendix.

### 3.2 METHODOLOGY LIMITATIONS

The new database usefully enhances existing data sources and presents a number of advantages. First, data are timely and can be sampled at monthly intervals. They are available as far back as 1999, which allows an analysis of developments since the advent of the euro. Moreover, they are fully in line with the “narrow” definition of international issuance by focusing on euro-denominated bonds issued by non-euro area residents only. In addition, the database is based on security-by-security data, which allows an analysis at the micro-level. Last and more importantly, it is wide in scope, containing information not only on the geographical breakdown of investments – unbounded to a specific number of reporting countries – but also of a more qualitative nature.

Having said that, when it comes to aggregated statistics on demand trends, reviewed in Section 5, two caveats have to be borne in mind. On the one hand, given that data are based on published articles, caution is warranted in interpreting apparent trends over time. For instance, the observation of an increasing frequency of Asian investors’ participation in primary market sales (see Section 5.1) may point to a higher demand for the euro in Asia. However, this trend could also be spurious and reflect an increase in the availability of information reported on Asian investors’ activity in the International Financing Review.

On the other hand, given that the information reported in the International Financing Review is sometimes only qualitative, classification problems may arise. For instance, as could be seen from Table 3.3, while more than 600 issues are classified as having been purchased dominantly by European investors, only about 200 issues are classified as having been purchased dominantly by euro area investors. This is so because information is sometimes vague or unavailable, making it difficult to identify with respect to many bonds whether euro area investors purchased more than 50% of the amount floated. For example, a bond reported to be “distributed into France, Italy, Germany and Scandinavia” is clearly purchased dominantly by European investors. Conversely, it cannot be classified *stricto sensu* as having been bought dominantly by euro area investors, given that shares are not reported and that “Scandinavia” may also include countries other than Finland. It is quite possible, however, that more than 50% of this issue was bought by euro area investors (demand from Denmark, Sweden and Norway is never explicitly reported to be above 50%), but the bond is not classified as such as explicit information is unavailable. Classification problems of this kind explain the large gap between the amount of bonds bought dominantly by European investors and that bought dominantly by euro area investors. In the same vein, it is worth noting that the respective amounts of bonds purchased dominantly by institutional investors and by retail investors do not add up to the total of the bonds for which relevant information on type of investor is available. This can be explained by lack of quantitative information or insufficiencies in the qualitative information reported in the International Financing Review, which makes it difficult to classify some of the issues as either group. Indeed, some information on the issues is presumably not systematically disclosed by the issuer for reasons of confidentiality or availability.

## 4 THE MAIN CHARACTERISTICS OF SUPPLY

On the basis of the new database, this section analyses the main characteristics of the supply side of the market for euro-denominated bonds issued by non-euro area residents, namely: salient features of the amounts issued (4.1), issuers (4.2), issues (4.3) and issuance determinants (4.4).<sup>7</sup>

### 4.1 AMOUNTS ISSUED

Since its creation in 1999, the euro has almost constantly remained the second currency of issuance in the international bond market. Between 1999 and 2003, issues of euro-denominated bonds announced by non-euro area residents amounted to around USD 1.2 trillion.<sup>8</sup> The euro had an average market share of 28% at current exchange rates, behind the US dollar, with about USD 1.9 trillion issued over the period (44% of the market), and the Japanese yen with roughly USD 460 billion issued (11% of the market). This ranking prevailed throughout most of the period (see Chart 5). In the third quarter of 1999, however, the issues of euro-denominated international bonds announced exceptionally exceeded those in US dollars. This possibly reflected the desire of large issuers to “establish a presence” in the market for bonds denominated in the new currency in the first months of Monetary Union

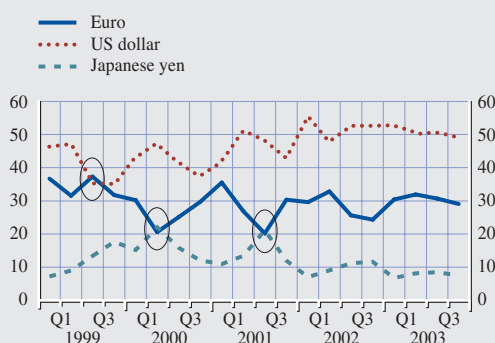
(BIS, 2000). Moreover, in the second quarter of 2000, Japanese yen-denominated international bond issues exceeded those in euro, due to strains related to the financing of UMTS licences in Europe. This increased corporate bond yields for euro issuance and fuelled expectations of a saturation in the euro bond market (ECB, 2001). Likewise, in the third quarter of 2001, Japanese yen-denominated international bond issues exceeded those in euro. The consequences of the events of 11 September, together with those of the Enron, Tyco and WorldCom affairs, affected especially the euro, as a significant share of issuers in the euro originate from the United States (see subsequent sub-section).

### 4.2 ISSUERS

Non-euro area issuers of euro-denominated bonds originate predominantly in the private sector. A sectoral breakdown of announced issues shows that financial institutions, together with other corporations, have constantly accounted for about 80% of total issuance throughout the period from 1999 to 2003, with shares of 50% to 60% and 20% to 30% respectively (see Chart 6). Issuing financial institutions included investment banks and brokerage houses, commercial banks as well as insurance companies and leasing companies, while the remaining corporations included both industrials and issuers from the so-called “new economy”, such as telecommunications, media and technology companies.

Chart 5 International bonds and notes: currency shares

(announced issues, excluding home currency issuance, as a percentage of the total amount)



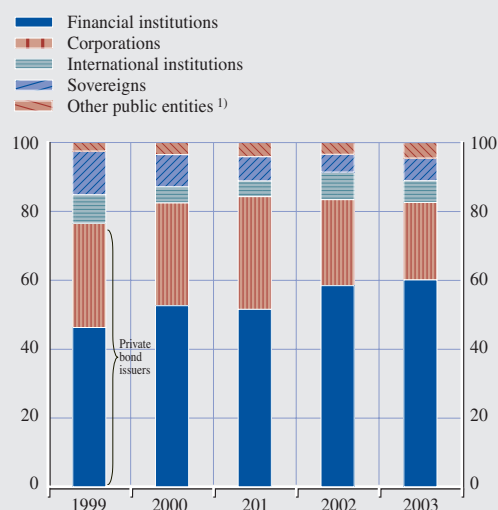
Sources: Bank for International Settlements and ECB staff calculations.

7 For the sake of comparability with results presented in Detken and Hartmann (2000 and 2002) and ECB (2001, 2002, 2003a and 2003b), the amounts issued are derived from the BIS, although they are also available from the new database. BIS data offer a breakdown by type of issuer and residence, which is fully presented here for the first time. Whatever choice of the source, the results are not affected (see also Table 1). The BIS uses Thomson ONE Banker-Deals and Bondware, together with other sources, to compile its own data.

8 This represents an average of USD 240 billions per year and is equivalent to about 2.5% of the stock of euro-denominated debt securities (bonds and notes and money market instruments) estimated end-2002, which includes both international and domestic issues.

**Chart 6 Announced euro-denominated bond issues by non-euro area residents: breakdown by issuer type**

(as a percentage of the total amount issued)

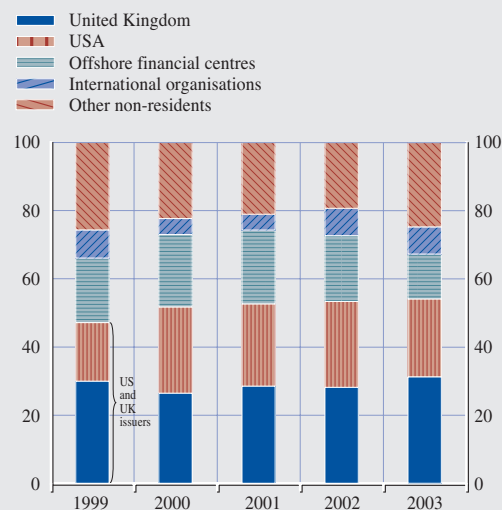


Sources: Bank for International Settlements and authors' calculations.

1) Includes public corporations, public banks and other public financial institutions.

**Chart 7 Announced euro-denominated bond issues by non-euro area residents: breakdown by issuer residence**

(as a percentage of the total amount issued)



Sources: Bank for International Settlements and authors' calculations.

Three other types of non-euro area resident entities issue in euro. The first are international institutions, in particular the European Investment Bank (EIB), the European Bank for Reconstruction and Development and the World Bank, with an average share of about 6%.<sup>9</sup> The second are sovereign issuers, whose share declined from 12% of total issuance in 1999 to 7% in 2003. These originated almost exclusively in Latin America (Argentina and Brazil, in particular), the new EU Member States, the Middle East and Turkey. The third are other public entities, including public corporations, banks and other financial institutions, whose share remained roughly stable at 5% of total issuance over time.<sup>10</sup>

The majority of non-euro area issuers of euro-denominated bonds are resident in Anglo-Saxon countries. A regional breakdown of bond issues reveals that, throughout the period from 1999 to 2003, UK and US residents accounted for about one-half of issuance activity with shares of about 30% and 20% respectively (see Chart 7). International corporations from both

within and outside the euro area, which are registered in offshore financial centres – presumably for tax reasons – also accounted for a significant share of total issuance.<sup>11</sup> Their share was close to 20% between 1999 and 2002, but declined to 13% in 2003. Denmark and Sweden accounted for more than 5% of total

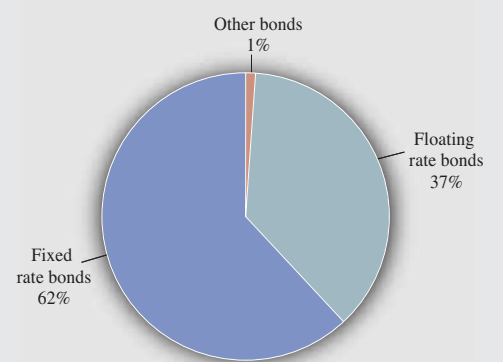
<sup>9</sup> The European Investment Bank, although a European body based in Luxembourg, is considered an international organisation here, as is the World Bank, for example (see also ECB, 2003b).

<sup>10</sup> In its former classification, the BIS also reported data for state-sponsored agencies, the share of which grew rapidly in the period from 1999 to 2002. This reflected the creation of a regular programme of large-size issuance by the Federal Home Loan Mortgage Corporation (“Freddie Mac”), a US government-sponsored agency specialising in mortgages. State-sponsored agencies are now classified as “Other public entities” by the BIS.

<sup>11</sup> Offshore financial centres (OFCs) are used by international companies to issue securities in a more favourable tax environment, in particular through “special purpose vehicles” (SPVs) which are especially popular to issue asset-backed securities. To this end, an onshore corporation establishes a corporation registered in an OFC and assigns assets (e.g. a portfolio of mortgages, loans and credit card receivables) to that corporation. Based on these underlying assets, a variety of securities can be offered to investors while the SPV, and hence the onshore parent, benefits from the favourable tax treatment in the OFC (Financial Stability Forum, 2000).

**Chart 8 Euro-denominated bonds issued by non-euro area residents: breakdown by coupon type (1999-2003)**

(as a percentage of the total amount issued)



Sources: Thomson Financial – Thomson ONE Banker-Deals and authors' calculations.

Note: Based on information available for 3032 bond issues.

issuance. All other issuers had a share of below 5%, indicating that emerging market countries' issuance activity in euro was highly limited by comparison with that of industrial countries. Issuers in Asia (including Japan) and the Pacific accounted for between 3% and 5%, compared with 2% for entities in the new EU Member States and Latin America (excluding Argentina).<sup>12</sup> Argentina was among the largest emerging market issuers, with a share of 3% in 1999 and 2000. That share, however, collapsed after its default in 2001. Another noteworthy emerging market issuer was Turkey, with a share of more than 1% in 1999 and 2000, which decreased substantially in the period from 2001 to 2003, however, due to the country's financial difficulties. Entities in Africa and the Middle East (excluding Turkey) had a negligible share, in line with their, all in all, limited activity in international financial markets.

The concentration of issuance on private Anglo-Saxon borrowers, as well as on borrowers from other industrial countries, suggests to some extent that euro-denominated international bond issuance is unlikely to be very vulnerable to emerging market crises. The Latin American segment stands out as an exception, as shown by developments in 2002 (see Section 5.2). Conversely, monitoring developments in the

segment of euro-denominated bond issues by UK and US corporations is more relevant, given its importance and the financial difficulties encountered, for instance by some of these corporations and government-sponsored agencies in between 2002 and 2003 (BIS, 2002 and IMF, 2003).

### 4.3 ISSUES

In line with general patterns observed in the international bond market, the euro-denominated segment is dominated by fixed rate issues.<sup>13</sup> From 1999 to 2003, fixed rate issues accounted for more than 60% of issues of euro-denominated bonds by non-euro area residents, while floating rate issues accounted for close to 40% and other bonds (including indexed and zero-coupon rates) for around 1% (see Chart 8).

These shares have remained broadly stable since the introduction of the euro, with the exception of 2001, when the share of fixed rate issues exceptionally increased to 70%, while that of floating rate issues decreased to 30%.

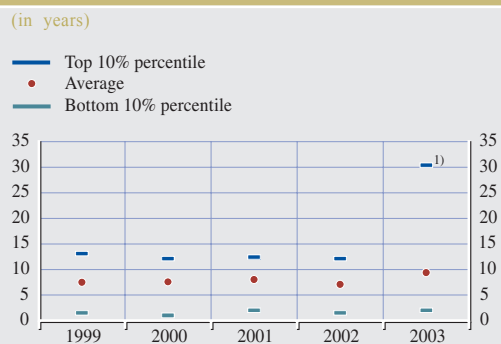
Euro-denominated bond issues by non-euro area residents, on average, have a medium-term maturity at issuance of about eight years (see Chart 9). The bulk of bonds' maturity at issuance ranged from one year to 14 years. A limited number of issues (close to 40) had a perpetual maturity at issuance. The issue with the longest finite maturity at issuance was a floating rate security launched by Osprey Mortgage Securities for 72 years in 2000. The evolution of the maturity distribution over time is challenging to explain, as it is likely to depend on a number of factors, including the term structure of interest rates along with

<sup>12</sup> The issuance activity of Latin American issuers, however, was more limited in 2002 and 2003, in the wake of Argentina's default.

<sup>13</sup> At the end of 2003, fixed rate issues accounted for 75% of the stock of international bonds and notes (defined according to the "broad" BIS definition), while floating rate issues accounted for 21% of that stock, and equity-related issues for 3% (BIS, 2004).

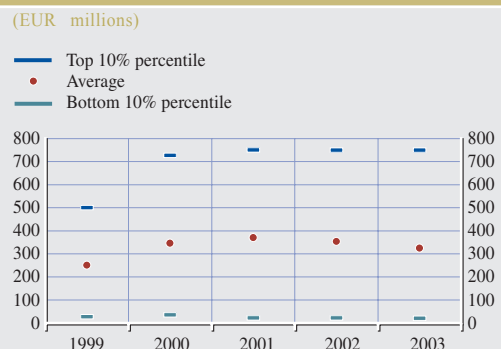


**Chart 9 Euro-denominated bonds issued by non-euro area residents: breakdown by maturity at issuance**



Sources: Thomson Financial – Thomson ONE Banker-Deals and authors' calculations.  
 Note: Based on information available for 3032 bond issues.  
 1) Skewed distribution due to frequent issuance of bonds with maturities at issuance above 30 years.

**Chart 10 Euro-denominated bonds issued by non-euro area residents: breakdown by size**



Sources: Thomson Financial – Thomson ONE Banker-Deals and authors' calculations.  
 Note: Based on information available for 3032 bond issues.

corporations' matching of assets and liabilities structure.

The average size of euro-denominated bond issues announced by non-euro area residents increased from about €250 million in 1999 to €320 million in 2003 (see Chart 10).

Most issues' size ranges between €20 million and €750 million. Thanks to the liquidity created by the pooling of demand from the 12 euro area Member States, very large transactions have become more frequent. Indeed, while the largest issue amounted to €2.5 billion in 1999, an ever higher number of issues was placed with twice that amount in subsequent years (see Table 4). Interestingly, all top issuers were either from the United States, the United Kingdom or the European Investment Bank.

This trend probably reflects competition between non-euro area borrowers to obtain benchmark status for their issues.<sup>14</sup> Until 2001, in the wake of the improvement of EU countries' fiscal situation, the largest non-euro area issuers had endeavoured to offer alternative benchmarks to sovereign debt, as the EU government bond supply was declining. Two of them announced plans for large and regular issues at selected points on the yield

curve. In September 2000, Freddie Mac launched a "Euro reference note" programme initially including a commitment to issue a minimum of €20 billion per year, with at least €5 billion each quarter through new issues or re-openings.<sup>15</sup> The size of this programme is comparable with, if not larger than, that of a number of EU sovereigns. Likewise, the European Investment Bank launched a large-scale programme for the regular issuance of "Euro area reference notes" resulting in a complete and liquid yield curve in euro, with maturities ranging from one to ten years and sizes between €3 billion and €6 billion.

Reflecting its importance for the role of the euro in international financial markets (ECB, 2003b), a significant share of euro-denominated bonds issued by non-euro area residents (almost one-quarter) is listed in the City of London (see Chart 11). An even higher share,

14 An issuer with benchmark status is a borrower issuing large and liquid debt securities that provide a reference point for the rest of the market and to which the prices of other bonds react.

15 More recently, Freddie Mac's issuance programme was reduced from EUR 5 billion to EUR 3.5 billion on a quarterly basis. According to market participants, while this programme helped the agency gain recognition among euro area investors and to attract them into its US dollar issuance programme, it has to pay a premium compared with US dollar issuance. Moreover, the agency no longer commits to issue every quarter, but only has an option to issue.

Table 4 Top euro-denominated bond issues by non-euro area residents

	Coupon (in %)	Maturity date	Amount (EUR millions)	Residence
<b>1999</b>				
Abbey National Treasury Services plc.	Floating rate	2000	2,500	UK
<b>2000</b>				
Federal Home Loan Mortgage Corp. (Freddie Mac)	5.75	2010	5,000	USA
Federal Home Loan Mortgage Corp. (Freddie Mac)	5.25	2006	5,000	USA
<b>2001</b>				
Federal Home Loan Mortgage Corp. (Freddie Mac)	4.50	2004	5,000	USA
Federal Home Loan Mortgage Corp. (Freddie Mac)	5.13	2012	5,000	USA
European Investment Bank	4.00	2007	5,000	International Institution
<b>2002</b>				
Federal Home Loan Mortgage Corp. (Freddie Mac)	4.63	2007	5,000	USA
Ford Motor Credit Co.	6.00	2005	5,000	USA
Federal Home Loan Mortgage Corp. (Freddie Mac)	6.86	2005	5,000	USA
European Investment Bank	5.38	2012	5,000	International Institution
European Investment Bank	3.50	2005	5,000	International Institution
Federal Home Loan Mortgage Corp. (Freddie Mac)	4.75	2013	5,000	USA
<b>2003</b>				
European Investment Bank	3.25	2008	5,000	International Institution
European Investment Bank	3.63	2013	5,000	International Institution

Source: Thomson Financial – Thomson ONE Banker-Deals and authors' calculations.

Note: Based on information available for 3032 bond issues.

more than one-third, was registered for trading in Luxembourg, 4% were listed on the Schweizer Boerse, while close to 30% were not quoted.

Furthermore, in line with the dominance of UK and US issuers, around 50% of all issues were governed by English law and about 20% were governed by New York State law. This probably reflects the concentration of the provision of legal services for financial transactions in the main financial centres of London and New York, which makes resorting to English or New York State law almost a market standard.

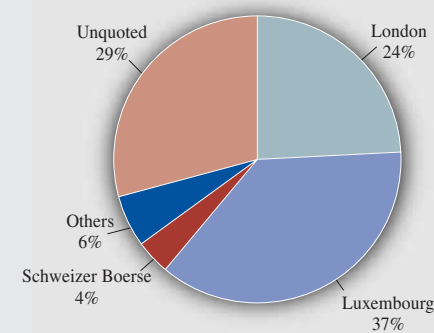
#### 4.4 ISSUANCE DETERMINANTS

The evidence contained in the database is in line with existing literature and the information gained from discussions with market participants on the main determinants of issuance of euro-denominated bonds by non-euro area issuers.

A first likely issuance determinant is the need to ensure that euro-denominated assets are hedged by euro-denominated liabilities. This probably applies to some of the largest non-euro area resident issuers that have activities in the euro area, and may have been all the more pressing in the early years of Monetary Union, which were

Chart 11 Euro-denominated bonds issued by non-euro area residents: breakdown by listing exchange (1999-2003)

(as a percentage of the total number of bond issues)



Sources: Dealogic (Bondware) and authors' calculations.  
Note: Based on information available for 3082 bond issues.

characterised by a wave of mergers and acquisitions across the Atlantic. Interestingly, foreign exchange exposure hedging has indeed been found in relevant literature to be a statistically significant determinant of foreign currency-denominated bond issuance (Keloaharju and Niskanen, 1997; Kedia and Mozumdar, 1999 and Esho, Sharpe and Webster, 2001). Another likely determinant is the need to diversify the investor base and to ensure safe access to funding sources, especially for issuers that have large capital needs and may fear a drying-up of their domestic capital market. For example, according to discussions with market participants, this may have been the case for the largest US borrowers, including Freddie Mac, GMAC, Ford, etc. Issuance in euro may occasionally help non-euro area issuers gain recognition among euro area investors and attract them to their domestic currency issuance programme, as has allegedly been the case for Freddie Mac. A final determinant is the opportunity to arbitrage financing costs across currencies. This may happen (i) when borrowers can issue a bond with a lower spread in euro than in domestic currency and (ii) when swap conditions allow this, i.e. if borrowers can convert this gain into domestic currency. In particular, the former arises if euro area investors are ready to buy bonds issued by non-euro area residents at a premium compared with the credit spreads prevailing in their domestic markets. This happens, for instance, when the issuer is considered to be a unique diversification opportunity (Grinblatt and Titman, 1998). Allegedly, as markets become more efficient and issuance cost differentials across currency narrow, this “opportunistic behaviour” should characterise a decreasing amount of issues. So far, there is explicit evidence that proceeds received in euro were swapped by issuers into another currency for more than 40 bond issues (see Table 5). The overall amount swapped totalled more than €20 billion. Swap types included foreign exchange swaps and cross-currency swaps. Swaps mostly involved the issuer’s domestic currency (including the US dollar and pound sterling, but

also the Czech koruna, Japanese yen, Norwegian krone, Swedish krona, Swiss franc and the Canadian dollar). In a few cases non-US issuers swapped euro proceeds into US dollars.<sup>16</sup> Knowing that non-resident issuers may resort to currency swaps sheds interesting light on a conjecture of McCauley and White (1997) who indicated prior to EMU that a possible “excess supply” of euro-denominated international bonds may put downward pressure on the euro in the foreign exchange markets.<sup>17</sup> Allegedly, in the first years of Monetary Union, buoyant issuance of euro-denominated bonds by non-euro area residents, coupled with a massive exchange of euro proceeds into domestic currency, would have contributed to the weakening of the euro. However, while there is no evidence that non-euro area issuers exchanged euro proceeds into domestic or other currencies via the spot market, there is evidence that they resorted to currency swaps to this end, which do not impact the exchange rate.<sup>18</sup> Caution is warranted in drawing general conclusions, however, given that evidence on currency swaps is available for only 5% of the bonds, as counterparts to the transaction might not wish to disclose this information in a number of instances.

16 These included two issuers from Canada (Province of Quebec 53/4% 2006, Royal Bank of Canada floating rate note 2003), one from Australia (Telstra Corp. Ltd. 5 7/8 % 2005) and one from the United Kingdom (Thames Water Plc floating rate note 2002).

17 See also Detken and Hartmann (2000) who regarded the increasing share of the euro in the supply of international bonds in connection with its flat share in the portfolio of 8 to 9 international bond managers surveyed by The Economist as evidence for a possible “excess supply” situation.

18 Theoretically, in its simplest form, a currency swap can be decomposed into two spot cash flows (e.g. the payment of euro and the receipt of US dollars) and two forward cash flows (receipt of euro and re-payment of US dollars), which are equivalent in discounted terms. Alternatively, a currency swap is comparable to lending in one currency (in euro, since euro are paid spot and received forward) plus borrowing in the other currency (in US dollars, since US dollars are received spot and re-paid forward). These two operations, by definition, do not impact the euro-US dollar exchange rate. Moreover, in practice, discussions with market participants suggest that the amounts involved are simply too small to impact the exchange rate, given that only differentials are swapped. Last, to estimate an overall net effect, issuance by euro area residents of bonds denominated in foreign currency, whose proceeds are subsequently exchanged into euro, has also to be taken into account.

**Table 5 Explicit evidence from the International Financing Review on euro-denominated bonds issued by non-euro area residents whose proceeds were swapped into another currency**

Issuer Name	Coupon (%)	Maturity Date	Amount (EUR millions)	Issuer's residence	Currency swap type <sup>1)</sup>
BMW Australia Finance	3	25-Jun-07	300	Australia	Fixed rate AUD
BMW US Capital Corp.	0	07-Dec-00	100	USA	Fixed rate USD
BMW US Capital Corp.	5 1/8	28-Jan-09	752	USA	Floating rate USD
Bombardier Capital Funding Limited Partnership	6 1/8	14-May-07	499	Canada	USD
City of Brno	5 7/8	20-Jul-11	60	Czech Republic	CZK
Credit Suisse Group Finance (US) Inc.		05-Oct-10	301	USA	USD
Credit Suisse Group Finance (US) Inc.	6 5/8	05-Oct-10	501	USA	USD
Daimler-Chrysler North America Holding Corp.		07-Sep-05	502	USA	Fixed rate USD
Daimler-Chrysler North America Holding Corp.	4 1/2	03-Jan-05	996	USA	Floating rate USD
Eurofima	5 1/2	08-Jan-03	101	Supra-National Agencies	Fixed rate CHF
Eurofima		30-Jun-03	498	Supra-National Agencies	Fixed rate CHF
Federal Home Loan Mortgage	3	24-Apr-06	500	United States	Floating rate USD
Financement Quebec		03-Dec-08	350	Canada	CAD
Ford Motor Credit Co.	5 5/8	06-Jun-06	1500	USA	USD
General Motors Acceptance Corp.	6 1/8	15-Mar-07	2000	USA	USD
GUS PLC	4 1/8	12-Dec-07	600	United Kingdom	Floating and fixed rate USD
Hutchison Whampoa Ltd	5 7/8	08-Jul-13	1000	Hong Kong	USD
Japan Bank For International	3 1/4	29-Jul-08	500	Japan	Floating rate USD
Japan Finance Corp for Small Business		06-Aug-02	301	Japan	Fixed rate JPY
Kommuninvest i Sverige AB	3 1/4	04-Mar-08	500	Sweden	SEK
Korea Development Bank	6	13-Apr-05	498	South Korea	Floating rate USD
Liberty Lighthouse Capital Company		17-Jun-02	200	Cayman Islands	Floating rate USD
MBNA America European Structured Offerings No. 7	5 4/9	16-Sep-13	756	USA	USD
National Grid Transco PLC	5	02-Jul-18	600	United Kingdom	USD
Novartis Securities Investment Limited Bermuda	4	06-Nov-06	900	Bermuda	JPY
NYA Birka Energi	6 3/8	03-Nov-06	504	Sweden	SEK
Pacific Life Funding LLC	4 7/8	30-Jul-07	300	USA	USD
PEMEX	6 1/4	05-Aug-13	500	Mexico	USD
Province of Ontario	3 1/2	12-Mar-10	400	Canada	USD
Province of Ontario	4 1/8	14-May-13	750	Canada	USD
Province of Quebec	5 3/4	15-Dec-06	150	Canada	USD
Royal Bank of Canada		07-Jul-03	500	Canada	USD
Spices Finance Limited Series 1		03-Aug-06	20	Jersey	USD
SPINTAB		28-Nov-03	500	Sweden	Floating-rate SEK
Telia AB	5 1/2	10-Sep-10	151	Sweden	Floating-rate SEK
Telstra Corp Ltd.	5 7/8	21-Jun-05	1000	Australia	Floating rate USD
Tesco PLC	5 1/4	07-May-08	500	UK	Floating rate GBP
Thames Water PLC		09-Feb-02	98	UK	Floating rate USD
Tokyo Electric Power Co Inc.	5 1/8	27-Mar-07	1000	Japan	JPY
Toyota Motor Credit Corp.	4 3/4	10-Nov-03	198	USA	Floating rate USD
Union Bank of Norway AS		19-Jan-04	500	Norway	Floating rate NKK

Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.  
1) When no explicit information on the currency swap type was available, only the currency acronym is reported.

## 5 THE MAIN CHARACTERISTICS OF DEMAND

Based on the new database, this section turns to the location (5.1) and the investor base (5.2) of the demand side of the market for euro-denominated bonds issued by non-euro area residents.

### 5.1 LOCATION

Since the advent of the euro in 1999, there has been constant evidence that euro-denominated bonds issued by non-euro area residents have been targeted chiefly at European investors. Almost all the bonds (90%) for which information on roadshows is available were presented solely in Europe, especially in the euro area and the City of London (see Chart 12). The locations of roadshows included one or several of the major European financial centres, such as Frankfurt, Milan, Paris or Zurich, and occasionally financial centres in the Benelux, Portugal, Spain and Scandinavia. The City of London and the United Kingdom are mentioned explicitly for one-third of the issues for which information is available. Overall, only a small number of issues (13) was also advertised outside Europe.<sup>19</sup>

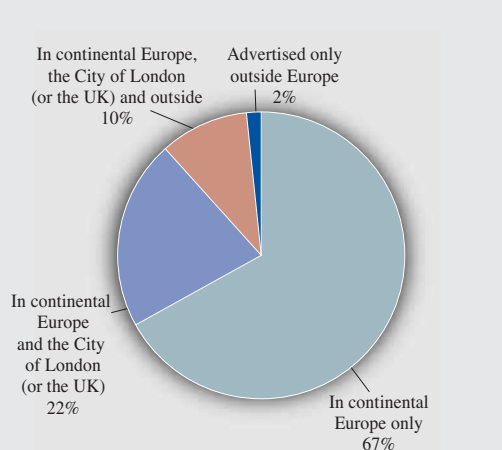
The function of the City of London as an intermediary in the market for euro-denominated bonds issued by non-euro area residents is illustrated further by UK banks' leading role as bookrunners, which have a 60% market share (see Chart 13). Banks from the euro area undertook these issuance-related activities, ranging from the preparation of the roadshow to the execution of the final sale, through a bank syndicate, for about one-fifth of the issues. Banks from Switzerland had a 15% market share.

Throughout the period, the bulk of euro-denominated bonds issued by non-euro area residents was initially purchased by European investors. On average, these investors dominantly bought on the primary market, with

<sup>19</sup> Four bonds were presented in the United States (Republic of Argentina 7 2/7% 2001 and 9 1/4% 2002, Cruise Ship Finance Ltd. floating rate note 2002, Kronos International Inc. 8 7/8% 2009), five in Asia (Korea Development Bank 6% 2005, Fonterra Co-operative Group Ltd. 5 1/4% 2007, St. George Bank Ltd. floating rate note 2007, OAO Gazprom 7 4/5% 2010, HBOS plc. 4 1/2% 2013), three in the Middle East (Bank Markazi Jomhorui Islami 8 3/4% 2007, Kommuninvest i Sverige AB 3 1/4% 2008, Kingdom of Morocco 5% 2008) and one in Brazil (Bombril SA 9 1/4% 2007).

**Chart 12 Euro-denominated bonds issued by non-euro area residents: breakdown by roadshow location (1999-2003)**

(as a percentage of the total number of bond issues)

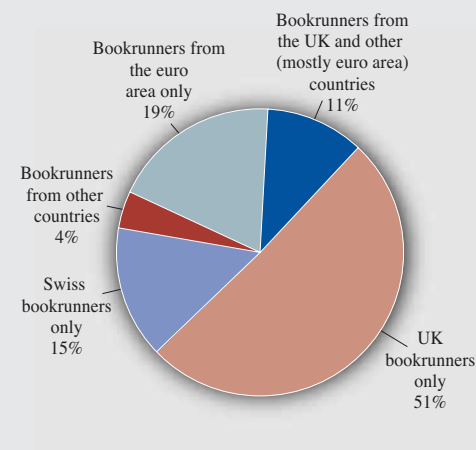


Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.

Note: Based on information available for 121 bond issues.

**Chart 13 Euro-denominated bonds issued by non-euro area residents: breakdown by bookrunner residence (1999-2003)**

(as a percentage of the total number of bond issues)

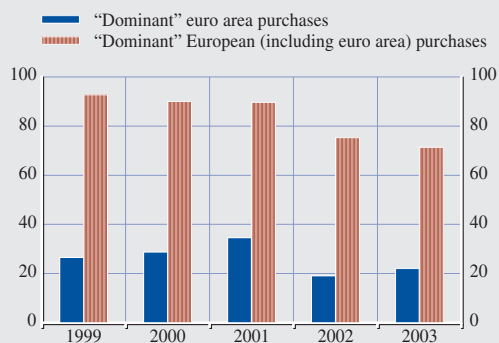


Sources: Dealogic (Bondware) and authors' calculations.

Note: Based on information available for 3082 bond issues.

**Chart 14 Euro-denominated bonds issued by non-euro area residents bought by European investors on the primary market**

(as a percentage of the total number of bond issues)

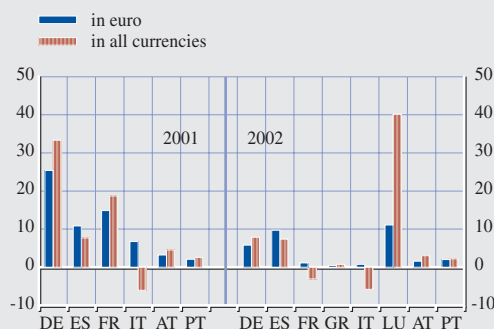


Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.

Note: Based on information available for 731 bond issues. "Dominant" = primary purchases > 50% of the amount issued.

**Chart 15 Net purchases by selected euro area countries of international bonds and notes from non-euro area residents<sup>1)</sup>**

(EUR billions)



Sources: National central banks of the respective countries.

1) The currency identified is that of the denomination of the securities, except in Luxembourg, Spain and Greece, where it is the currency of settlement of transactions. Positive (negative) amounts represent net purchases (sales) of bonds and notes by euro area residents from (to) non-euro area residents. Data for Greece and Luxembourg are not available for 2001.

a share of more than 80% of the bonds for which information about the location of demand is available. Moreover, a quarter of these issues can be classified as being bought dominantly by euro area investors. Due to classification challenges, their actual share could even be much higher (see Section 3.2.). Interestingly, these two shares have declined between 1999 and 2003, from about 90% to 70% and from one-quarter to one-fifth respectively. This trend could indicate a greater diversification of demand towards non-European investors. It may also arise from a figment of the data, revealing a relative increase in information reported on investments by non-European accounts on the primary market (see Section 3.2).

This evidence is in line with data available from a number of euro area countries on the currency breakdown of net purchases by their residents of debt securities issued outside the euro area. (see ECB 2002, 2003b). According to these data, in both 2001 and 2002, euro-denominated issues accounted for the bulk of international bonds and notes purchased by Austrian, German, Greek (in 2002), Portuguese and

Spanish investors from non-euro area residents, revealing a possible home currency bias. French (in 2002) and Italian investors were also net purchasers of euro-denominated issues from non-euro area residents, although – when taking into account issues in other currencies – they were overall net sellers of bonds and notes. Only investors from Luxembourg, for which data are only available for 2002, did not buy primarily euro-denominated issues, with the latter only accounting for one-quarter of their net purchases of international bonds and notes from non-euro area residents.<sup>20</sup>

The euro area aside, UK investors also showed significant interest in euro-denominated international bond issues by non-euro area residents. On average, they participated in the primary sale of more than half the issues for which information on the location of demand is available and accounted for substantial purchases in more than 10% of them (see Chart 16). In addition, their interest in euro-

<sup>20</sup> The absence of a home currency bias in Luxembourg can partly be explained by the large number of foreign banks in this country.

**Chart 16 Euro-denominated bonds issued by non-euro area residents bought by UK and Swiss investors on the primary market**

(as a percentage of the total number of bond issues)

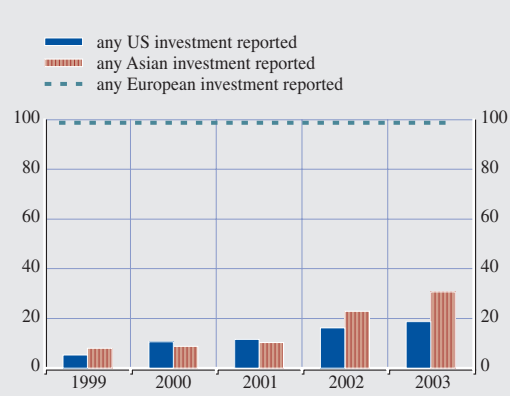


Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.

Note: Based on information available for 731 bond issues. "Substantial" = primary purchases > 20% of the amount issued.

**Chart 17 Euro-denominated bonds issued by non-euro area residents: primary market activity of US and Asian investors**

(as a percentage of the total number of bond issues)



Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.

Note: Based on information available for 731 bond issues.

denominated securities seems to have risen over time. Indeed, between 1999 and 2003, the share of issues purchased substantially by UK investors gradually increased from 5% to above 20%. Over the same period, the share of issues for which UK investor participation was reported rose from about 50% to 60%. This may point to a rising role of the City of London as a hub for buying and issuing euro-denominated international bonds. Alternatively, it could reveal a relative increase in the information reported on investments from the United Kingdom on the primary market. Interestingly, however, discussions with market participants suggest that, in their view, the City of London is used by non-EU residents as a hub for their euro-denominated business (ECB, 2003b). Market participants indicated, for instance, that banks or hedge funds located in the City of London can be used by US (and also continental European) investors to purchase euro-denominated bonds on their behalf, albeit to an extent difficult to estimate (*ibid.*).

The participation of Swiss investors was more limited. On average, they expressed interest in

about 30% of the issues for which information is available. However, this share declined from roughly 40% in 1999 to 20% in 2003. This may reveal a decreasing interest of Swiss investors in euro-denominated securities. Alternatively, this could point to a relative decrease in the information reported on Swiss investments in the primary market. Moreover, they accounted for substantial purchases in only 1% of the issues.

Interest from US and Asian investors was also relatively limited over most of the period, as they participated in about 10% and 15% respectively of primary market sales of those issues for which information is available (see Chart 17). However, the frequency of their participation increased from 5% and below 10% respectively in 1999 to about 20% and 30% respectively in 2003. There are even a number of bonds for which US or Asian investors bought more than 20% of the amount issued on the primary market. However, there is no bond for which they accounted for more than 50% of primary market purchases. Discussions with market participants suggest that, in Japan in

2003, there seems to have been increasing interest in euro-denominated securities from commercial banks and, in other Asian countries outside Japan, from central banks as well (ECB, 2003b). Interest was allegedly especially strong for high-quality issues, and was perhaps driven by considerations concerning the diversification of reserve holdings and/or with a view to benefiting from the appreciation of the euro (*ibid.*)

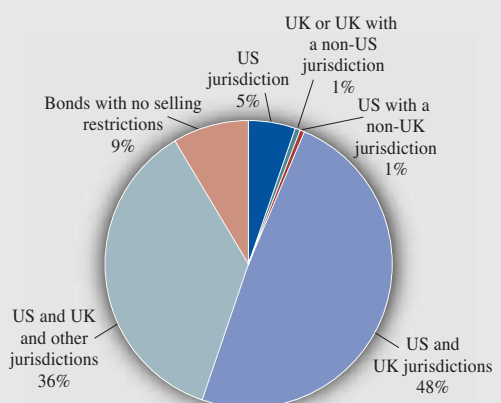
From 1999 to 2003, US investors purchased on the primary market in particular bond issues from large US entities, Latin American sovereigns, Eastern Europe (including the new EU Member States, Croatia and Russia) as well as from other emerging markets (e.g. Israel, South Africa, Turkey). Issues from large US entities, Asia and the European Investment Bank were popular among Asian investors.

The seemingly limited US interest may be explained by legal considerations. Almost all euro-denominated bonds issued by non-euro area residents (90%) were subject to selling restrictions in the United States and/or the United Kingdom (see Chart 18). In particular, most bonds issued by US companies were probably considered “offshore” issues under US law (in compliance with Regulation S of the Securities and Exchange Commission (SEC)) whose sales are restricted in the United States (e.g. during a “seasoning” period of 40 days).<sup>21</sup> In addition, small non-US issuers may have been reluctant to bear the costs related to the registration and disclosure of information required by the SEC to sell securities in the United States. These standard requirements, which aim to protect US investors, could indeed be considered “expensive and cumbersome” (Wood, 1995).

Only a minority of bonds (about 140, i.e. less than 5%) fall under the provisions of SEC Regulation 144A, which allows offshore US and non-US issuers alike – subject to lighter requirements – to place their bonds in the United States, but only with “informed”

**Chart 18 Euro-denominated bonds issued by non-euro area residents: breakdown by sale-restricted jurisdictions (1999-2003)**

(as a percentage of the total number of bond issues)



Sources: Dealogic (Bondware) and authors' calculations.  
Note: Based on information available for 3082 bonds.

institutional investors. Interestingly, when US investors do buy euro-denominated international bonds, available evidence suggests that they are either bonds that fall under the provisions of Regulation 144A or bonds purchased via offshore accounts (probably to circumvent Regulation S).<sup>22</sup> This suggests that legal considerations have an influence on US investments in euro-denominated international bonds. US investors perhaps also buy euro-denominated bonds via their UK branches. There are often selling restrictions in the United Kingdom as well, but they are more of a procedural nature and do not

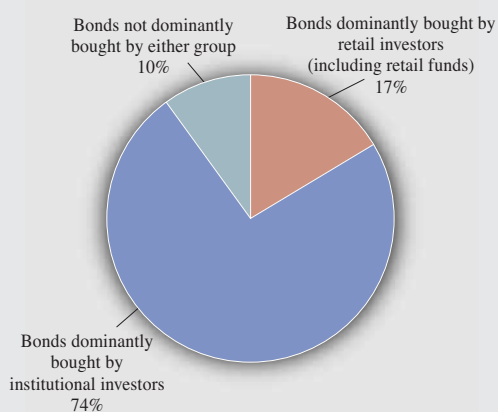
<sup>21</sup> Under SEC's Regulation S, a “designated offshore securities market” is explicitly defined to include, in particular, the Eurobond market. To the extent that these bonds are not registered with the SEC, underwriters are legally prohibited from selling new issues to the US public. This is, however, deemed to have occurred after the issue has come to rest and a seasoning period of 40 days has expired (Steward, 2001).

<sup>22</sup> Data also indicate that the increase in US participation reflects increasing US offshore accounts demand (rather than an increasing number of Regulation 144A-eligible issues).



**Chart 19 Euro-denominated bonds issued by non-euro area residents: breakdown by investor type (1999-2003)**

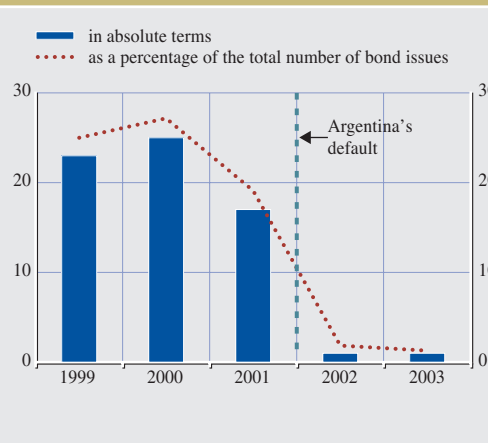
(as a percentage of the total number of bond issues)



Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.

Note: Based on information available for 407 bond issues. "Dominantly" = primary purchases > 50% of the amount issued.

**Chart 20 Euro-denominated bonds issued by non-euro area residents "dominantly" bought by retail investors on the primary market**



Sources: Thomson Financial – Thomson ONE Banker-Deals, International Financing Review (various issues) and authors' calculations.

Note: Based on information available for 407 bond issues. "Dominantly" = primary purchases > 50% of the amount issued.

prevent UK residents from buying, as is the case with SEC regulations.<sup>23</sup>

The United States and Asia aside, investors from other regions participated prominently in euro-denominated issues of their own nationals.<sup>24</sup> In 2003, discussions with market participants suggest that there was a growing interest in euro-denominated international bond issues from investors in the Middle East, with purchases being channelled through the Lebanon, in particular (ECB, 2003b).<sup>25</sup>

## 5.2 INVESTOR BASE

The investor base of the market for euro-denominated bonds issued by non-euro area residents is mostly institutional. On average, about three-quarters of the bonds for which information is available were bought dominantly by the institutional sector on the primary market, while retail investors purchased dominantly less than one-fifth of these issues (see Chart 19).

<sup>23</sup> Like in the United States, selling restrictions in the United Kingdom are aimed at avoiding the work and expense of regulations and relevant authorisations. In the United Kingdom, these are additional to those of the Financial Services and Markets Act (FiSMA), specifically Section 19, which make it an offence for a person to accept deposits unless authorised to do so by the Financial Services Authority ("FSA") or exempt. This includes in particular, as defined in the FiSMA (Regulated Activities) Order 2001 (hereinafter referred to as the "Order"), all bond issues. Thus, euro-denominated international bonds may contain the relevant restrictions in order to avoid the necessity of such authorisation and subsequent regulation. The primary restriction will be to ensure that there is no offer to the public, as defined by the Public Offers of Securities Regulations 1995 (hereinafter referred to as the "Regulations"), or non-professional market participants (i.e., according to the Order, persons "whose ordinary activities involve them in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of their business; or who it is responsible to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their business"). Another usual restriction will be a maturity of not more than 365 days. This may be either, or both, further to the Regulations and/or in order to avoid UK tax.

<sup>24</sup> For instance, one-third of the investors who purchased Colombia 11 3/8% 2008 on the primary market were from Colombia, while in the case of Kasakhoil Finance BV 9% 2007, one-fifth were from Kazakhstan, and in that of Turkey 9 3/4% 2007, one-fourth were from Turkey.

<sup>25</sup> For instance, investors from the Middle East purchased on the primary market more than half the amount issued of two bonds from Bank Markazi Jomhorui Islami Iran (8 3/4% 2007 in July 2002, as well as 7 3/4% 2008 in December 2002), one-quarter of a sovereign issue from Morocco (5% 2008, in June 2003) and 10% of an issue from the EIB (3 1/4% 2008, in March 2003).

The share of bonds purchased dominantly by institutional entities has increased significantly over time, rising from two-thirds in 1999 to close to 80% in 2003. Conversely, the share of bonds purchased dominantly by retail investors decreased from roughly one-fourth in 1999 and 2000 to one-fifth in 2001 and only 1% in 2002 and 2003 (see Chart 20). Indeed, both in 2002 and 2003, only one bond was placed dominantly with retail investors.<sup>26</sup> Interestingly, “buy-and-hold” retail investors – mostly from Italy and Germany, but also from Spain and occasionally Portugal – held mainly Latin American bonds. The latter accounted for 60% (40 issues) of the bonds reported to have attracted a majority of retail demand, with more than one-half of the issues originating in Argentina (i.e. 25 issues, with 17 sovereigns).

The collapse of retail demand is probably due to the fact that the euro-denominated Latin American segment proved to be more prone to financial contagion than the equivalent US dollar segment. Further to Argentina’s default, institutional investors in the US dollar segment, who were tracking benchmark indices, retrenched away from the country, but re-balanced their portfolios in accordance with the country’s falling weight in these indices. This supported discrimination across issuers, limiting contagion and benefiting especially those countries that gained most from benchmark re-weighting (notably Brazil, Mexico and Russia). Conversely, in the wake of the Argentinean default, retail investors in the euro segment, who did not manage their assets by tracking benchmarks, also exited other Latin American sovereign bonds markets, pushing the spreads of several euro-denominated emerging market bonds beyond those of comparable US dollar-denominated issues. This hampered new issuance in euro from Latin American borrowers, both on the supply side, as euro issuance was no longer price-competitive compared with US dollar issuance, and on the demand side, as the classic European retail demand, increasingly risk averse, was no longer ready to invest again (see IMF, 2002).

26 IKB Funding Trust (a US borrower) in 2002 and Daimler Chrysler Canada (a Canadian borrower) in 2003.

## 6 CONCLUSIONS

Given its relevance for the recent evolution of the international status of the euro, this Occasional Paper has analysed the main features, thus far largely unknown, of the market for euro-denominated bonds issued by non-euro area residents on the basis of a new database. In so doing, it provides background material that allows some of the general conclusions on the international role of the euro that had been drawn by the ECB in recent years to be substantiated.

First and foremost, the paper has shown that, while the largest single issuers were Freddie Mac and the European Investment Bank, large private corporations from mature economies have contributed significantly to the internationalisation of the euro since 1999, more than sovereigns in transition and emerging economies, whose part was initially expected to be stronger. Outside the euro area, the bulk of euro borrowers have been financial institutions and corporations from Anglo-Saxon countries. They have probably used the euro due to microeconomic, treasury management-related, considerations. These may have included the need to hedge currency exposure, but also strategic goals, such as that of widening the investor base, benchmark issuance, or more opportunistic objectives, such as the will to seize swap window opportunities, so as to reduce borrowing costs.

Moreover, the paper has confirmed that the euro's international role is characterised by a strong regional focus, being most prominent in countries located in the immediate vicinity of the euro area. In particular, it has provided ample evidence that the City of London plays a key role in the market for euro-denominated bonds issued by non-euro area residents, be it on the supply side, the demand side or as an intermediary. When it comes to demand, the paper has shown in addition that the euro's reach in the rest of the world has been more limited thus far, albeit – recently – with some increasing interest in Asia.

Finally, the paper provides empirical support to the view that the international role of the euro has, to some extent, been driven by the euro area itself. Euro area investors are shown to have been significant purchasers of euro-denominated bonds issued by non-euro area residents, providing finance in euro to the rest of the world. This contributes to the understanding of the discrepancy observed between the stable share of the euro in the bond portfolios of large international fund managers, on the one hand, and the rising share of the euro in the stock of international bonds, on the other.

Looking ahead, the ECB intends to keep abreast of developments, by regularly updating information contained in the database, in particular for its annual Review of the international role of the euro. In order to assess whether the particular traits observed for the euro are specific or apply generally to international currencies, it could even be envisaged to expand the database's coverage to US dollar issues by non-US residents.

## TECHNICAL APPENDIX: DETAILS ON THE DATA CLASSIFICATION

The items “location of demand”, “investor base” and “roadshows” are each broken down into several sub-items. Individual bond issues are allocated to these sub-items depending on available information and according to the following classification.

The “location of demand” is broken down into ten sub-items that span the entire spectrum of regions or countries that may buy euro-denominated bonds issued by non-euro area residents. These include the euro area which is an important investor, as well as the United Kingdom and Switzerland, two of its neighbours that have large financial centres investing in the euro. Taken together, the euro area, the United Kingdom, Switzerland and other countries in Scandinavia and Eastern Europe are jointly referred to as “Europe”. Outside Europe, the United States and Asia are considered separately, and jointly referred to – together with the rest of the world – as “Non-Europe”. Some of the sub-items pertain to a situation where investors from a region or a country are reported to have purchased a share of the amount floated, no matter how high this share is. For instance, an issue reported to have “attracted investors from Asia” is classified in the sub-item “Issues with any Asian participation”. The remaining sub-items correspond to a situation where investors from a region or a country are reported to have purchased “dominantly” or “substantially” the corresponding bond.

An issue is considered to have been “dominantly” purchased by investors if they account for more than 50% of primary market purchases or are reported to be such by the International Financing Review. For instance, a bond reported to have “attracted a mix of accounts, mostly from Germany, Spain, and Italy”, or to have been “sold 50% to Germany, 10% to the United Kingdom and 20% to Greece” is classified as having been bought “dominantly” by euro area investors.<sup>27</sup> Likewise, an issue is considered to have been purchased “dominantly” by European investors if investors from the United Kingdom and/or

Switzerland and/or Scandinavia and/or Eastern Europe, together with those from the euro area, account for more than 50% of primary market purchases. An issue is considered to have been bought “substantially” by investors if they account for more than 20% of primary market purchases. The “type of investor” is broken down into two sub-items indicating whether an issue is bought dominantly either (i) by institutional investors or (ii) by retail investors. An issue is classified as being dominantly bought by institutional (or retail) investors if they account for more than 50% of primary market purchases or are reported to be such by the International Financing Review. Retail funds are considered retail investors. For instance, an issue “bought 48% by fund managers, 15% by insurance and pension funds, 22% by banks and 5% by retail investors” is classified as being dominantly bought by institutional investors.

Finally, “roadshows” and “currency swaps” correspond to one sub-item each. The first one indicates whether the roadshows organised for the corresponding issue took place only in Europe or not, to capture the importance of the euro’s domestic market. This is the case, for example, for a bond whose “bookrunner was roadshowing to existing and potential investors throughout Europe”. The other indicates whether information on the use of currency swaps to convert euro proceeds into another currency is reported or not, to assess whether the corresponding issuer really needed finance in euro, an example thereof being “the proceeds were swapped into US dollars”.

<sup>27</sup> In which case, the bond also qualifies under “Issues with any UK participation”.



## REFERENCES

- BIS (2000), *Quarterly Review*, November, Basel.
- BIS (2002), *Quarterly Review*, December, Basel.
- BIS (2004), *Quarterly Review*, March, Basel.
- Bernanke, B. (2004), “Euro at five: ready for a global role? Remarks at the Institute for International Economics conference, Washington D.C., 26 February 2004.
- Bergsten, F. (1997), “The dollar and the euro”, *Foreign Affairs*, 76(4), pp. 83-95.
- Blinder, A. S. (1996), “The role of the dollar as an international currency”, *Eastern Economic Journal*, Vol. 22, No 2, pp. 127-136.
- Cohen, B. J. (1971), *The future of sterling as an international currency*, Macmillan, London.
- Detken, C. and P. Hartmann (2000), “The euro and international capital markets”, *ECB Working Paper*, No 19, April 2000.
- Detken, C. and P. Hartmann (2002), “Features of the euro’s role in international financial markets”, *Economic Policy*, Issue 35, October 2002, pp. 553-570.
- Domingo Solans, E. (2003a), “The international role of the euro in a globalised economy”, speech delivered at the Pareto Securities Economic Conference, Oslo, 27 March 2003.
- Domingo Solans, E. (2003b), “An analysis of the international role of the euro: its impact on economic relations between Asia and Europe”, speech delivered at the Fifth Asia-Europe Young Parliamentarians Meeting organised by the National People’s Congress and the Asia-Europe Foundation, Guilin, China, 24 October 2003.
- ECB (1999), “The international role of the euro”, *Monthly Bulletin*, Frankfurt am Main, August 1999, pp. 31-53.
- ECB (2001), *Review of the international role of the euro*, Frankfurt am Main.
- ECB (2002), *Review of the international role of the euro*, Frankfurt am Main.
- ECB (2003a), “The international role of the euro: main developments since the inception of Stage Three of Economic and Monetary Union”, *Monthly Bulletin*, Frankfurt am Main, November 2003, pp. 71-79.
- ECB (2003b), *Review of the international role of the euro*, Frankfurt am Main.
- Esho, N., I Sharpe, and K. Webster (2001), “Hedging and choice of currency denomination in international syndicated loan markets”, mimeo.
- Financial Stability Forum (2000), *Working group on offshore financial centers report*, April 2000, Basel.

Grinblatt, M. and S. Titman (1998), *Financial markets and corporate strategy*, Irwin/McGraw-Hill, New York.

Hakkio, C. (1993), "The dollar's international role", *Contemporary Policy Issues*, Vol. 11, pp. 62-75.

Hartmann, P. (1998), *Currency competition and foreign exchange markets: the dollar, the yen and the euro*, Cambridge University Press, Cambridge, New York and Melbourne.

Hartmann, P. and O. Issing (2002), "The international role of the euro", *Journal of Policy Modeling*, July 2002, pp. 315-345.

IMF (2002), *Global financial stability report*, March, Washington D.C.

IMF (2003), *Global financial stability report*, September, Washington D.C.

Israël, J.-M. (2002), *Paper on the Centralised Securities Database*, Irving Fisher Committee, 20-22 August, Basel, [http://www.oee.fr/pdf/oeefree\\_pdf/361\\_8.pdf](http://www.oee.fr/pdf/oeefree_pdf/361_8.pdf).

Kedia, S. and A. Mozumdar (1999), "Foreign currency-denominated debt: an empirical investigation", mimeo.

Keloharju, M. and M. Niskanen (1997), "Why do firms raise foreign currency-denominated debt?", *Helsinki School of Economics and Business Administration Working Paper*.

Kenen, P. (1983), "The role of the dollar as an international currency", *Group of Thirty Occasional Papers*, No. 13.

McCauley, R. (1997), "The euro and the dollar", *BIS Working Paper*, No. 50, November 1997.

McCauley, R. and W. White (1997), "The euro and European financial markets", *BIS Working Paper*, No. 41, May 1997.

Padoa-Schioppa, T. and F. Papadia (1984), "Competing currencies and monetary stability" in *Europe's money: problems of European monetary co-ordination and integration*, R. Masera and R. Triffin (ed.), Clarendon Press, Oxford.

Portes, R. and H. Rey (1998), "The emergence of the euro as an international currency", *Economic Policy*, April 1998, pp. 305-332.

Santos, J. and K. Tsatsaronis (2002), "The cost of barriers to entry: evidence from the market for corporate euro bond underwriting", paper presented at the April 2002 workshop launching the ECB-CFS research network on "Capital Markets and Financial Integration in Europe" at the ECB.

Steward, C. (2001), "International bond markets and instruments", in F. Fabozzi (ed.), *The handbook of fixed-income securities*, 6<sup>th</sup> edition, McGraw-Hill, New York, pp. 361-378.

Wood, P. (1995), *Comparative financial Law*, Law and practice of financial law series, Sweet and Maxwell, London.

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