EUROPEAN CENTRAL BANK

EUROSYSTEM

THE INTERNATIONAL ROLE OF THE EURO

JULY 2009

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ROLE OF THE EURO

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In 2009 all ECB
publications
feature a motif
taken from the
€200 banknote.

CONTENTS

STATISTICAL TABLES

ABBREVIATIONS

COUNTRIES

AT	Austria	KR	Korea, Republic of
AU	Australia	LT	Lithuania
BE	Belgium	LU	Luxembourg
BG	Bulgaria	LV	Latvia
CA	Canada	MY	Malaysia
CH	Switzerland	MK	Macedonia, former Yugoslav
CY	Cyprus		Republic of
CZ	Czech Republic	MT	Malta
DE	Germany	MX	Mexico
DK	Denmark	NL	Netherlands
DZ	Algeria	PL	Poland
EE	Estonia	PT	Portugal
ES	Spain	RO	Romania
FI	Finland	RU	Russia
FR	France	SE	Sweden
GR	Greece	SI	Slovenia
HR	Croatia	SK	Slovakia
HU	Hungary	TH	Thailand
ID	Indonesia	TR	Turkey
IL	Israel	UA	Ukraine
IN	India	UK	United Kingdom
IT	Italy	US	United States
JP	Japan		

OTHERS

ABS	Asset-backed securities
BIS	Bank for International Settlements
CDS	Credit default swap
CLS	Continuous Linked Settlement
COFER	Currency Composition of Official Foreign Exchange Reserves
CPIS	Coordinated Portfolio Investment Survey
EA	Euro area
EBS	Electronic Broking Services
ECB	European Central Bank
ESCB	European System of Central Banks
EU	European Union
IMF	International Monetary Fund
MFI	Monetary financial institution
OeNB	Oesterreichische Nationalbank
OTC	Over the counter
PVP	Payment-versus-payment
SPV	Special purpose vehicle
TARGET	Trans-European Automated Real-time Gross settlement Express Transfer system
TIC	Treasury International Capital

FOREWORD

This is the eighth issue of the annual review of the international role of the euro. It reviews trends in the use of the euro by non-euro area residents in global markets and in individual countries outside the euro area, and aims to deepen the Eurosystem's analytical understanding and statistical coverage of the international use of the euro.

The main findings are in line with those of earlier reviews. The international use of the euro has continued to display a relatively high degree of stability over the past year. Although the global financial crisis has had a very profound impact on many market segments discussed in the review, the relative importance of major international currencies has remained broadly unchanged across nearly all market segments. The review also confirms the strong regional character of the international role of the euro. There is some evidence that the euro has further strengthened its role in currency and asset substitution in countries with close geographical and institutional links to the euro area.

Developments in the role of the euro abroad are primarily the result of market forces and private sector decisions. The ECB will continue to monitor the international role of the euro and to provide regular information to the public.

Jean-Claude Trichet
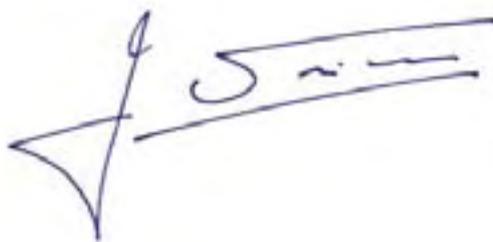
President of the European Central Bank
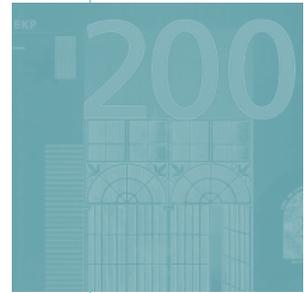
I INTRODUCTION

This review examines recent developments in the use of the euro by non-euro area residents in international trade and international financial transactions. It provides the public with a broad set of timely indicators and statistics, drawing partly on original data compiled by the ECB and the national central banks of the Eurosystem as well as on time series provided by other central banks participating in surveys carried out by the ECB. To facilitate the wider use of key data by analysts and researchers, selected time series are presented in a coherent and structured way in a statistical annex.

This issue of the review contains some new time series, in particular as regards the international role of currencies in asset-backed securities markets (see Box 2). In addition, data that were newly introduced in the most recent issues are updated in the current version, including data on the use of the euro in derivatives markets and data from the Coordinated Portfolio Investment Survey (CPIS) of the International Monetary Fund (IMF).

In line with earlier reviews, this issue compares the international role of the euro with that of other major international currencies such as the US dollar, the pound sterling and the Japanese yen. To facilitate comparisons between currencies over time, the review consistently removes exchange rate-related valuation effects by presenting statistical time series at constant exchange rates. During the year 2008, for instance, the euro depreciated by 5.5% against the US dollar,[1] triggering, ceteris paribus, some decrease in the relative weight of euro-denominated instruments relative to US dollar-denominated instruments.

In the review, an effort is made to put the international market segments into a broader context of recent global macroeconomic and financial developments. In addition, cross-references have been introduced between the various market segments. Also, where relevant and possible, the review compares the international use of the euro with its domestic use in transactions between euro area residents.

This provides another relevant angle from which to assess the degree of "internationalisation" of the euro.[2]

Finally, the review further deepens the Eurosystem's analytical understanding of the drivers and implications of the international use of the euro. To that end, it contains a special focus section presenting the main findings of recent ECB staff research on the determinants of currency choice in international bond issuance. Additional new analysis is presented on the implications of the international role of the euro in trade invoicing for exchange rate pass-through (Box 4) and on the empirical determinants of the currency composition of reserves (Box 5).

The review is structured as follows. Section 2 summarises the main findings. Section 3 examines the role of the euro in global markets, in particular debt securities markets, international loan and deposit markets, foreign exchange markets, and international trade. Section 4 focuses on the euro's role in third countries, i.e. countries outside the euro area, including foreign reserves, cash holdings, and bank deposits and loans. This section also presents updated results of the survey on the use of the euro in central, eastern and south-eastern Europe conducted by the Oesterreichische Nationalbank. Finally, Section 5 contains the special focus chapter, which examines the determinants of currency choice in the issuance of foreign currency-denominated bonds.

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1 Change between 31 December 2007 and 31 December 2008.
2 In a few market segments, only a global measure is presented of the euro's international use, i.e. the sum of domestic and international use. This is in particular the case when data sources do not provide a breakdown by residence of transacting agents.
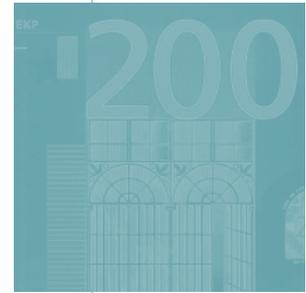
2 MAIN FINDINGS

BROAD STABILITY IN THE INTERNATIONAL ROLE OF THE EURO, DESPITE THE GLOBAL FINANCIAL CRISIS

This review shows that the global financial turmoil, despite having a very marked impact on overall financial market activity, has not triggered any notable shifts in the currency preferences of market participants. As a result, the international role of the euro, when measured relative to the international role of other currencies, remained fairly stable during the review period. This also applies to recent developments following the intensification of the financial market turmoil in September 2008. All in all, this finding corroborates the conclusion of earlier reviews that the international role of currencies tends to be relatively stable over time.

During the review period, the international role of the euro, when compared with the international role of other currencies, remained relatively stable across a range of market segments. Particularly when measured at constant exchange rates, changes in the share of the euro in international financial markets remained limited over the year 2008.

In international debt markets, the share of euro-denominated debt securities in total outstanding securities increased by around 1 percentage point between end-2007 and end-2008 (see Table 1).[3] In cross-border loan and deposit markets, the share of euro-denominated instruments in the fourth quarter of 2008, at 22.2% for loans and 22.4% for deposits, was around two percentage points higher than one year earlier. In foreign exchange trading, the share of the euro in transactions settled by the Continuous Linked Settlement (CLS) system increased from 37.8% on average in 2007 to 41.2% on average in 2008. Finally, in global foreign exchange reserve holdings, the share of euro-denominated instruments increased somewhat to 26.5% at the end of 2008, from 25.3% one year earlier. Overall, these changes in currency shares across market segments are relatively limited, and their magnitude is fully in line with fluctuations observed in previous years.

At the same time, the broad stability of the relative importance of the euro as an international

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3　See the notes to Table 1 for precise definitions of the concepts used in this section.

Table 1 Key data on the international role of the euro

	End-2008	End-2007[3]
Share of the euro in:	(unless otherwise indicated)	
– stock of **international debt securities** (narrow definition)[1]	Q4 2008: 32.2%	Q4 2007: 31.3%
– stock of **cross-border loans**[1]	Q4 2008: 22.2%	Q4 2007: 20.7%
– stock of **cross-border deposits**[1]	Q4 2008: 22.4%	Q4 2007: 20.5%
– daily **foreign exchange trading** (settled by CLS)[2]	Jan 2008 - Dec 2008 (average): 41.2%	Jan 2007 - Dec 2007 (average): 37.8%
– **settlement/invoicing of goods exports** from selected euro area countries to non-euro area countries	2007: 40% to 79%	2006: 39% to 68%
– **settlement/invoicing of goods imports** of selected euro area countries from non-euro area countries	2007: 35% to 73%	2006: 34% to 59%
– stock of **global foreign exchange reserves**[1]	2008 Q4: 26.5%	2007 Q4: 25.3%
Cumulative net **shipments of euro banknotes** to destinations outside the euro area	Dec. 2008: €95.4 billion	Dec. 2007: €71.1 billion

Sources: See respective sections of this review.
1) At constant Q4 2008 exchange rates.
2) 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.
3) Figures may differ from those presented in the 2008 review owing to data revisions and the recalculation of historical time series at constant Q4 2008 exchange rates.

currency was coupled with significant declines in total outstanding amounts or transaction volumes across most financial market segments. Following several years of rapid financial market expansion, spurred by financial innovation and globalisation, the global financial turmoil triggered a halt or even a reversal in growth in some financial market segments, especially following the intensification of the turmoil in mid-September 2008. During the second half of 2008, the stock of international debt securities decreased by 7.7%,[4] the stock of cross-border loans by 17.4%, and the stock of cross-border deposits by 16.2%, as net issuance of these instruments was negative throughout the second half of the year. Activity also declined on foreign exchange markets, with data from the EBS electronic trading system showing a decline in daily average transaction volumes from USD 226 billion in the first three quarters of 2008 to USD 179 billion in the last quarter.[5] Also during the second half of 2008, global foreign exchange reserves fell by around USD 300 billion, or 4.3% of their peak in mid-2008, as the central banks of some emerging market economies used their foreign exchange reserves to ease depreciation pressures on their currencies.

By contrast with this general finding, currency shares have been considerably more volatile in the market for asset-backed securities (ABSs), which is covered for the first time in the report in Box 2. In this market, the share of the euro in international ABS issuance, as defined in the box, doubled from around 30% on average during the years 2006-08 to almost 60% in the last quarter of 2008, against the background of very severe disruptions to the functioning of the ABS market in the course of 2008.

In sum, therefore, it seems that the global financial turmoil has had a very marked impact on overall financial market activity, but that this impact has been broadly shared among individual international currencies, leaving relative currency shares broadly unaffected – with the exception of ABS markets. The global financial turmoil thus appears not to have

triggered any marked shifts in the currency preferences of market participants. This stability of currency preferences is in line with the observation that the US dollar has maintained, as the crisis has unfolded, its status as the most important international currency globally, based also on the depth and liquidity of US financial markets in an environment of flight to quality on the part of investors. All in all, these recent trends corroborate the conclusion of earlier reviews that the international role of currencies tends to be relatively stable and that its dynamics are characterised by considerable inertia and network effects.

To deepen the Eurosystem's analytical understanding of drivers of the role of the euro in global financial markets, the special focus section of this review examines the determinants of currency choice in the issuance of international foreign currency-denominated bonds. It investigates, in particular, whether the ability to lower borrowing costs – exploiting deviations from uncovered or covered interest parity – plays any role in the currency choice of international bond issuers. The analysis suggests that issuers prefer, all other things being equal, to borrow in currencies that are associated with low nominal interest rates. However, expectations of an appreciation in the issuance currency seem to play no role in the currency choice. Implicit in this finding is the empirical failure of uncovered interest parity, a key pillar of international financial theory.

THE REGIONAL PATTERN OF THE EURO'S INTERNATIONAL ROLE IS CONFIRMED
The review also shows that the international role of the euro maintains a strong regional pattern, i.e. its international use continues to be most pronounced in countries with close geographical and institutional links with the euro area. In some countries, there is evidence of an increasing role of the euro in currency substitution (use of euro banknotes) and asset substitution (use of the euro in bank deposits and

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4 Data based on the narrow measure as reported in Section 3.1.
5 The data source is described in Section 3.3.

loans) during 2008. These trends are not without risks for the countries concerned. In particular, the global financial crisis has underscored the risks associated with unhedged borrowing by households and corporations in some non-euro area EU Member States and EU candidate or potential candidate countries, as a depreciation of some currencies against the euro may lead to an increase in the borrowing costs of these economic agents.

As documented in earlier reviews, the euro plays a predominant role in both international and domestic transactions of countries with close geographical and institutional links with the euro area. This applies, in particular, to some non-euro area EU Member States, most of the EU candidate and potential candidate countries, and some of the other countries in EU neighbouring regions.

In terms of international trade, the euro's already high share in settlement and invoicing continued to increase during 2007 in most non-euro area EU Member States and EU candidate countries. A closer analysis of available data, also drawing on the experience of countries joining the euro area between 2007 and 2009, suggests that network externalities and the choice of exchange rate regime might influence the growing use of the euro in invoicing and settlement of trade in countries outside the euro area (see Section 3.4).

In terms of international finance, euro-denominated instruments appear to dominate the international asset and liability positions of euro area neighbouring countries. On the liability side, recent data on international debt securities confirm the predominant share of euro-denominated instruments in the external debt of these countries (see Section 3.1). On the asset side, euro-denominated instruments prevail within the foreign exchange reserve portfolios of those central banks of non-euro area EU Member States that disclose their reserve composition (see Section 4.1). New analytical findings suggest that the share of the euro in these reserve holdings has been

rising over time, mainly owing to exchange rate arrangements using the euro as a point of reference and the denomination of external debt in euro (see Box 5).

In domestic transactions, the euro plays a predominant role in currency and asset substitution, i.e. in the use of foreign currency cash holdings and foreign currency-denominated bank deposits and loans. The review provides some tentative evidence of an increase in currency and asset substitution across several central, eastern and south-eastern European countries. While respondents to the latest half-yearly survey conducted by the Oesterreichische Nationalbank did not report a change in behaviour (see Box 6), more recent data seem to point to an increase in both currency and asset substitution. Specifically, the use of euro banknotes, which is concentrated to a considerable extent in euro area neighbouring regions, increased, with data on cumulated shipments of euro banknotes recording an unprecedented increase from €71.1 billion in December 2007 to €95.4 billion in December 2008. This rise signals an increased preference for cash holdings in some non-euro area countries, reflecting public concern about potential bank solvency problems in the context of the intensifying global financial turmoil. As regards asset substitution, the share of the euro in bank deposits and loans increased in most non-euro area EU Member States and EU candidate countries, suggesting that the euro has to some extent fulfilled a "safe haven" role in a few of these countries during the global financial crisis (see Section 4.2).

The analysis in this review confirms that the intensity of the use of the euro differs considerably across countries. Cross-country differences are due to various elements, including trade patterns, consumer preferences, historical traditions, regulatory and supervisory policies, and the track records of local currencies in terms of price stability.

The global financial crisis has highlighted that the international use of currencies in third countries may create macroeconomic and

financial stability risks. In particular, the widespread extension of foreign currency-denominated or foreign currency-indexed loans in some central, eastern and south-eastern European countries has created risks in the balance sheets of economic agents. On the flow side, because of the low initial debt servicing costs associated with a large interest rate differential vis-à-vis domestic currency loans, the extension of foreign currency loans may contribute to overall credit growth, thereby potentially contributing to excessive credit growth during boom periods. On the stock side, a high level of outstanding loans denominated in foreign currency may pose potential risks to financial stability. Through the extension of foreign currency loans, banks have converted exchange rate risk into credit risk. While a change in the exchange rate no longer directly affects banks' balance sheets, it would change the value of the loan relative to the repayment capacity of unhedged borrowers.
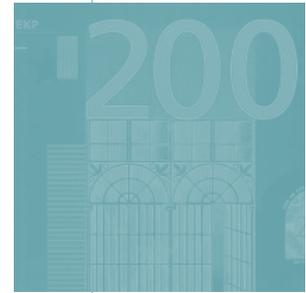
3 THE EURO IN GLOBAL MARKETS

3.1 THE EURO IN INTERNATIONAL DEBT MARKETS

The international use of the euro in debt securities markets arises when an instrument denominated in euro is issued by a non-euro area resident, is held by a non-resident, or is both issued by and held by non-residents. A comparison of these three aspects can be derived indirectly by combining various data sources, including the international investment position, for which, in the case of the euro area, a currency breakdown is available until mid-2008. These data suggest that the euro's use in global debt securities markets has a similar structure to that of the US dollar, with euro-denominated debt held by non-residents being somewhat more significant than euro-denominated debt issued by non-residents.

More timely data up to the end of 2008 are available on the issuer perspective of the international use of the euro in international debt securities markets. These figures show that the financial crisis – while having led to a decline of amounts outstanding in most international market segments – has hardly impacted the currency composition of international debt markets. The share of the euro in international debt securities (excluding domestic issuance) increased by around 1 percentage point to 32.2% when measured at constant exchange rates.

As in the past, three structural elements continue to characterise euro-denominated debt issued by non-residents. First, financial institutions account for a larger share of total international debt than in the case of other major international currencies. Second, issuers from non-euro area EU countries (in particular Denmark, Sweden and the United Kingdom) but also from North America are among the largest non-euro area issuers of euro-denominated debt. Third, in terms of the issuing countries, the euro has retained its regional importance as the main international currency for issuing debt in countries in central, eastern and south-eastern Europe.

This section examines recent developments in the use of the euro in international debt markets, which includes bonds, notes and money market instruments. The international use of a currency in debt securities markets arises when an instrument denominated in a specific currency is issued by a non-resident, is held by a non-resident, or is both issued by and held by non-residents. These three distinct aspects of the international use of currencies can be captured indirectly by combining various data sources, and with a significant reporting lag. Evidence for mid-2008 is presented in Sub-section 3.1.1, which focuses on the international use of the euro in debt securities markets but also provides a comparison with the use of the US dollar as at end-2007. In addition, more detailed evidence at the level of third countries is presented, derived from the IMF's CPIS as at end-2007.

More timely and detailed data are available for one of these three aspects, namely the international use of the euro from an issuer perspective. Sub-section 3.1.2 reviews currency shares in this market segment and compares them with global debt markets which include domestic issuance as at end-2008. Sub-section 3.1.3 provides more details on recent and structural developments within the market segment of euro-denominated debt securities issued by non-residents.

3.1.1 DOMESTIC AND INTERNATIONAL DEBT SECURITIES MARKETS DENOMINATED IN EURO AS AT MID-2008

The three aspects of the international use of the euro in debt securities markets can be gauged by combining information on the currency breakdown of euro area portfolio investment assets and liabilities with data from the Bank for International Settlements (BIS) on total outstanding debt securities denominated in euro (the "global measure" of international debt securities, which includes domestic issuance) and outstanding euro-denominated debt issued by non-residents (the "narrow measure" of international debt securities).[6] The resulting

6 Debt issuance by non-residents may include issuance by subsidiaries of euro area entities resident outside the euro area.

figures allow a broad comparison of the respective market segments in terms of absolute and relative magnitudes (see Table 2).[7] These figures suggest that, as at mid-2008, the three aspects of the international use of the euro differed in terms of size:

- Euro-denominated debt securities issued by residents, and held by non-residents, accounted for the largest share of the international use of the euro, with a total outstanding amount of €2.1 trillion.

- Euro-denominated debt securities issued by non-residents, and held by residents, amounted to €1.5 trillion.

- Euro-denominated debt securities that were both issued and held by non-residents were, in relative terms, the least important segment, with an outstanding amount of €791 billion.

The comparison suggests two preliminary conclusions with respect to the internationalisation of euro-denominated debt securities. First, the international use of the euro in debt securities

markets has remained relatively small in comparison with the domestic market, as the outstanding amount of debt securities that were both issued and held by euro area residents amounted to €12.6 trillion (74% of total euro-denominated debt) as at mid-2008. Second, within the international market segments, euro-denominated debt held by non-residents is somewhat more significant than euro-denominated debt issued by non-residents. This would suggest that the international use of the euro in debt securities markets is driven relatively strongly by issuance from the euro area itself.

These observations appear to be broadly comparable with the international use of debt securities denominated in US dollar, which can be approximated by combining BIS data with figures provided by the US Treasury International Capital (TIC) reporting system.[8] The latter are, however, only available as at end-June of each year (see Chart 1). However, the share of debt securities held by non-residents in total US dollar-denominated debt is somewhat higher (around 27%) than in the case of euro-denominated debt (17%). Further comparing the magnitude of the international market segments for euro and US dollar-denominated debt securities suggests that "entirely international" debt securities – i.e. those issued and held by non-residents – are somewhat more significant in the case of the US dollar.

Likewise, US dollar-denominated debt securities which are issued domestically but held by non-residents are somewhat more significant than in the case of the euro. Debt securities which have been issued by non-residents but held domestically, on the other hand, are in relative terms more significant in the case of the euro.

Table 2 Euro-denominated debt securities by residence of holder and issuer as at mid-2008

(international role is indicated by shaded areas)

	Held by residents	Held by non-residents	Total
EUR billions			
Issued by residents	12,603	2,118	14,722
Issued by non-residents	1,456	791	2,247
Total	14,060	2,909	16,968
As a percentage of total euro-denominated debt			
Issued by residents	74.3	12.5	86.8
Issued by non-residents	8.6	4.7	13.2
Total	82.9	17.1	100.0

Sources: ECB, BIS and ECB staff calculations.
Notes: Figures are only indicative as they are derived from different sources with distinct valuation methods. In particular, data on debt issued by non-residents and held by residents as well as debt issued by residents and held by non-residents are derived from the euro area's international investment position, which reports figures at market value. Figures for total euro-denominated debt and total euro-denominated debt issued by non-residents, on the other hand, are based on BIS figures, which report notional amounts outstanding.

7 Owing to distinct valuation methods, these figures are not perfectly comparable. In particular, data on debt issued by non-residents and held by residents as well as debt issued by residents and held by non-residents are derived from the euro area's international investment position, which reports figures at market value.

8 These figures may not be perfectly comparable as they are derived from different sources which may have distinct valuation methods and different reference periods. In particular, figures on US dollar-denominated debt securities which have been issued by US residents and are held by non-residents refer to June 2007.

Chart 1 Domestic and international market segments of euro and dollar-denominated debt

(as a percentage of total debt securities outstanding)

euro

entirely
international

issued outside –
held domestically

issued
domestically –
held outside

entirely
domestic

US dollar

entirely
international

issued outside –
held domestically

issued
domestically –
held outside

entirely
domestic
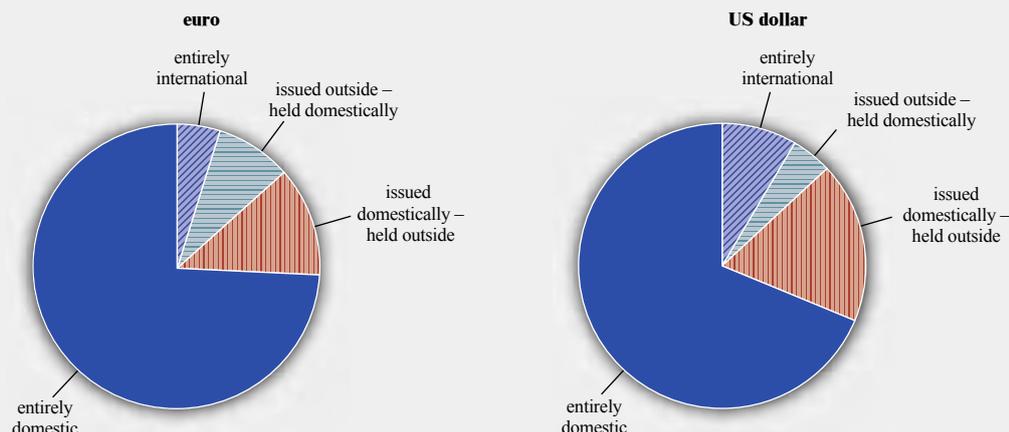
Sources: ECB, BIS, IMF, US TIC reporting system and ECB staff calculations.
Notes: Figures refer to different reference periods and are only indicative as they are derived from different sources with distinct valuation methods (see notes to Table 2).

In addition to a broad analysis by residents versus non-residents, a more detailed geographical breakdown of international debt securities is often of interest, providing useful indications on whether an international currency is mainly used in specific regions or globally. While information on the residency of non-resident issuers of debt securities is available in a timely and comprehensive manner (see Sub-section 3.1.3), data on holdings of cross-border debt securities by currency at the country level are only available for some countries which report such information to the IMF's CPIS.[9] As in the past, such figures

continue to suggest that mainly non-euro area EU countries and EU neighbouring countries hold a notable share of their foreign debt securities in euro-denominated instruments (see Chart 2 and Table 1 of the statistical annex).

9   CPIS figures refer to cross-border assets and therefore do not fully correspond to total euro-denominated debt held by non-residents. For example, euro-denominated debt issued by a US entity would not appear in the international investment position of the United States since it represents a cross-border claim. Likewise, CPIS figures do not fully correspond to euro-denominated debt issued by euro area residents since, in the above example, US economic agents could also hold euro-denominated debt issued by an entity resident in the United Kingdom.

Chart 2 Share of the euro in portfolio investment assets held in debt securities as at end-2007

(percentages)

Selected developed economies

	DK	SE	CH	JP	IL	US	KR
	48	44	37	20	18	10	7

Selected emerging market economies

	UA	HU	RO	BG	PL	TH	MX	RU
	28	28	33	60	25	6	0	5
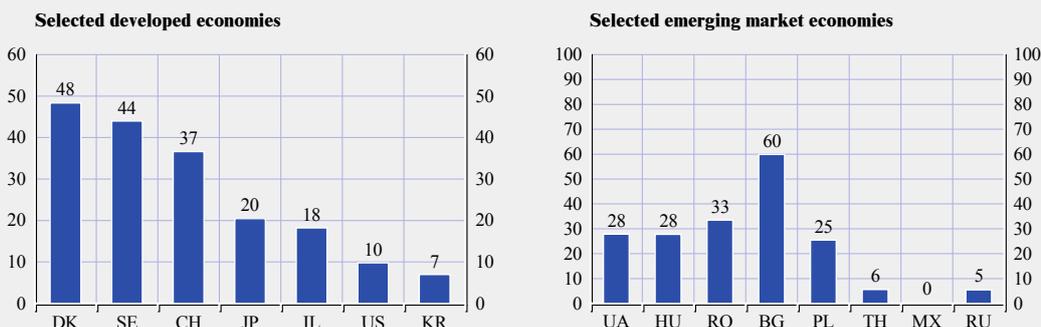
Sources: IMF's CPIS and ECB calculations.

CPIS figures suggest that countries in the western hemisphere and Asia hold sizeable shares of their foreign debt in US dollar-denominated securities (see Table 1 of the statistical annex).

3.1.2 TRENDS IN THE GLOBAL CURRENCY COMPOSITION OF INTERNATIONAL DEBT SECURITIES MARKETS DURING 2008

Monitoring the international role of currencies by computing currency shares in global debt securities markets is often carried out with a focus on the "narrow measure" of international debt securities, as this measure is the only indicator which is available in a timely manner and which unambiguously includes only international transactions. Nevertheless, it has been argued that the concept of a "global currency" should also reflect the size of the domestic market segment (Thimann, 2009). Indeed, the determinants of currency preferences within this narrow market segment may differ from broader trends. For example, there are indications that financial institutions active in these international debt markets make currency choices on the basis of interest rate differentials (see the special focus section). Against this background, this sub-section reviews developments in the currency composition of the narrow measure and the global measure of international debt securities during 2008.

As at the fourth quarter of 2008, the global measure of euro-denominated debt, i.e. total domestic and international debt in euro, stood at USD 24.6 trillion (see Table 3). The share of the euro in global debt markets increased slightly, by around one percentage point, to 29.5% when

Chart 3 International (narrow) and global measures of outstanding international debt securities

(USD trillions; at current exchange rates)
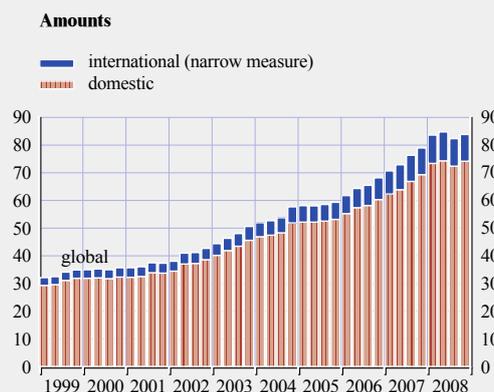
(percentages; at constant exchange rates)
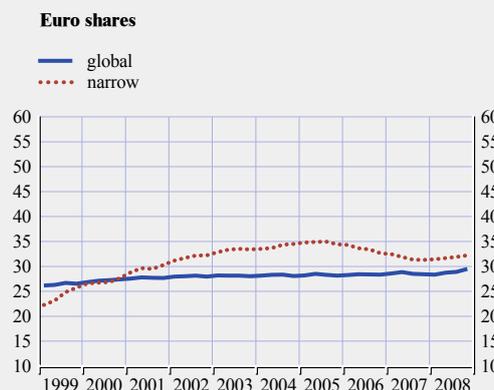
Sources: BIS and ECB calculations.
Note: The shares at constant exchange rates are reported at Q4 2008 exchange rates.

adjusted for valuation effects (see Chart 3). At the same time, the share of US dollar-denominated debt securities remained broadly unchanged when adjusted for valuation effects.

Table 3 Alternative measures of debt securities supply and major currencies' shares

(fourth quarter of 2008; values at current exchange rates)

	Amounts outstanding (USD billions)				Shares (%)		
	Total	Euro	US dollar	Japanese yen	Euro	US dollar	Japanese yen
"Narrow" measure	9,625	3,098	4,299	656	32.2	44.7	6.8
"Global" measure	83,530	24,601	33,225	11,861	29.5	39.8	14.2

Sources: BIS and ECB calculations.

Table 4 Net issuance of international debt securities

(narrow measure, i.e. excluding home currency issuance; USD billions)

	Annual				Quarterly				
					2007	2008			
	2005	2006	2007	2008	Q4	Q1	Q2	Q3	Q4
Euro	232.1	290.0	336.2	179.7	37.0	72.5	133.1	12.8	-38.7
US dollar	321.9	752.4	729.6	110.8	34.5	38.8	93.1	23.1	-44.2
Japanese yen	-1.0	15.3	76.2	9.2	21.2	11.5	20.9	2.7	-25.9
Total (including. other currencies)	764.2	1,321.7	1,406.7	381.8	127.2	178.2	314.1	33.7	-144.2

Sources: BIS and ECB calculations.

According to the narrow measure, international debt securities denominated in euro stood at end-2008 at USD 3.1 trillion (see Table 3).[10] The share of the euro in this market segment increased by around 1 percentage point to 32.2% when adjusted for valuation effects (see the next sub-section for a more detailed discussion).

3.1.3 THE MARKET FOR EURO-DENOMINATED DEBT SECURITIES ISSUED BY NON-RESIDENTS: RECENT DEVELOPMENTS AND STRUCTURE AS AT END-2008

RECENT DEVELOPMENTS IN INTERNATIONAL DEBT SECURITIES MARKETS

In the fourth quarter of 2008 the net issuance of international debt securities (measured throughout this sub-section according to the narrow definition,

i.e. excluding domestic issuance) turned negative (see Table 4). This reflected the impact of the global financial turmoil, which intensified after mid-September 2008 and resulted in a notable decline in issuance of money market instruments and, to a lesser extent, bonds and notes (see also BIS, 2009).[11]

10 Some international institutions such as the BIS also refer to a "broad measure" of international debt securities, which adds to the narrow measure domestic bond issues which are "targeted" at international markets. The share of the euro in this measure has remained broadly stable, reaching 47.7% at end-2008. However, the broad measure of international debt securities may overstate the extent to which euro-denominated issues are targeted towards the international market. For example, the broad measure includes issuances placed by a syndicate of financial institutions in which at least one institution does not share the borrower's nationality. In the case of the euro area, this also applies to other euro area countries.

11 The findings of the BIS are not fully comparable since they refer to the broad measure of international debt securities.

Chart 4 Stock of international debt securities (narrow measure): outstanding amounts and currency shares

(USD trillions; at current exchange rates)

(percentages; at constant exchange rates)
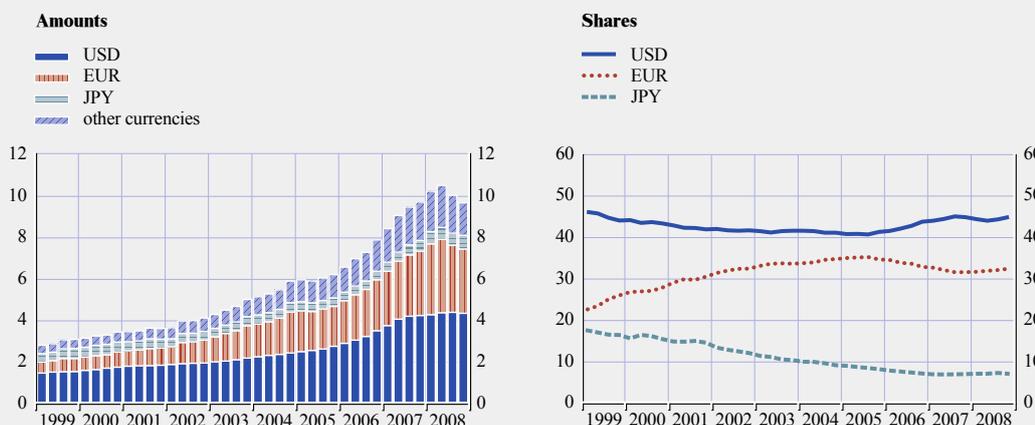
Sources: BIS and ECB calculations.

Chart 5 Outstanding volume of euro-denominated international bonds and notes by sector

(USD billions)

- international organisations
- financial institutions
- corporations
- other public entities [1]
- sovereign

Sources: BIS and ECB calculations.
1) includes public corporations, public banks and other public financial institutions.

As a result of these developments, the stock of outstanding international debt securities declined to USD 9.6 trillion (from USD 10.4 trillion in June 2008). This decline in amounts outstanding was broadly symmetric across the major currencies, so that the currency composition of the stock of international debt securities hardly changed, with the share of the euro increasing by around 1 percentage point when adjusted for valuation effects (see Chart 4).

INTERNATIONAL BONDS AND NOTES BY SECTOR AND GEOGRAPHICAL ORIGIN OF ISSUANCE

As in the past, an updated breakdown by sector and residency of issuer is used to underpin the structural characteristics of international euro-denominated bonds and notes (excluding money market instruments). As in the case of international debt securities, the amount outstanding of international bonds and notes denominated in euro decreased during the second half of 2008, albeit to a lesser extent as money market instruments are excluded from this measure. The decline was distributed broadly symmetrically across sectors (see Chart 5).

In line with previous findings, the majority of international euro-denominated bonds and notes thus continued to be issued by the private

sector, and in particular by the financial sector (see Chart 6). As at end-2008, financial institutions' share in total international bonds and notes denominated in euro stood at 71.3%, which was higher than their share in international bonds and notes denominated in US dollars (54.4%) and Japanese yen (54.7%). At the same time, the share of sovereign issuers in total

Chart 6 Outstanding volume of international bonds and notes by sector

(percentages; fourth quarter of 2008)
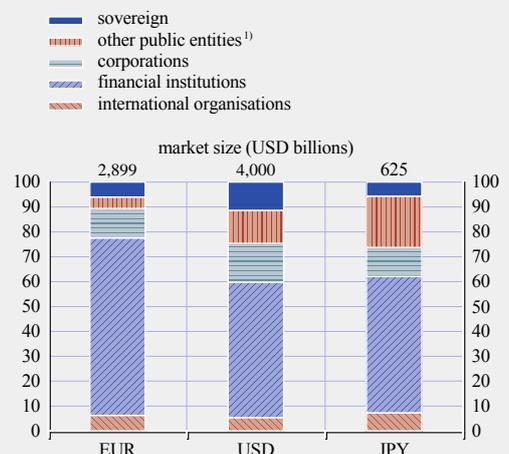
- sovereign
- other public entities [1]
- corporations
- financial institutions
- international organisations

market size (USD billions)

Sources: BIS and ECB calculations.
1) includes public corporations, public banks and other public financial institutions.

Table 5 List of top 20 non-euro area issuers of euro-denominated bonds and non-US issuers of US dollar-denominated bonds

(total amount issued in the review period; EUR millions)

Top 20 non-euro area issuers of euro-denominated bonds		Top 20 non-US issuers of US dollar-denominated bonds	
Barclays Bank plc	15,236	Kreditanstalt fuer Wiederaufbau – KfW	24,453
Credit Agricole SA (London)	12,599	European Investment Bank – EIB	23,209
Credit Suisse (London)	10,773	Newfoundland CLO 1 Ltd	15,491
UBS AG (London)	9,952	Royal Bank of Scotland plc	7,910
Holmes Master Issuer plc Series 2008 – 1	9,405	Landwirtschaftliche Rentenbank	7,050
Royal Bank of Scotland plc	8,392	Westpac Banking Corp	6,776
Bank of Scotland plc	8,200	Barclays Bank plc	6,387
Danske Bank A/S	7,700	Royal Bank of Canada	6,134
DnB NOR Bank ASA	7,621	Rabobank Nederland	5,842
JP Morgan Chase & Co	6,338	Bank Nederlandse Gemeenten NV – BNG	5,455
Skandinaviska Enskilda Banken AB – SEB	6,210	National Australia Bank Ltd	5,332
Swedbank AB	5,780	Australia & New Zealand Banking Group Ltd – ANZ	5,253
Colston No 2 plc	5,726	Inter-American Development Bank – IADB	4,893
EFG Hellas plc	5,630	Instituto de Credito Oficial – ICO	4,410
Svenska Handelsbanken AB	5,515	Holmes Master Issuer plc Series 2008-2	3,837
Goldman Sachs Group Inc	5,093	ANZ National International Ltd (London)	3,811
Greenock Funding No 2 plc	5,048	Credit Suisse (Guernsey) Ltd	3,741
Toronto-Dominion Bank	5,000	Caisse d'Amortissement de la Dette Sociale – CADES	3,727
Alpha Credit Group plc	4,809	IBRD World Bank	3,726
Swedbank Mortgage AB	4,585	Svenska Handelsbanken AB	3,655
Memo item:			
European Investment Bank	17,486		

Sources: DCM Analytics and ECB calculations.

international bonds and notes denominated in euro remained smaller (6.0%) than in the case of those denominated in US dollars (11.4%).

During the review period, financial institutions based in the United Kingdom were the largest issuers of euro-denominated bonds (see Table 5). At the same time, investment banks in the United States were somewhat less active in issuing euro-denominated debt than in the past. A similar ranking for US dollar-denominated bonds issued by non-US residents finds that – in line with previous findings – European public banks are among the largest issuers of US dollar-denominated debt.

As in the past, a geographical breakdown of international bonds and notes denominated in euro by the region in which the issuers reside suggests that non-euro area EU countries (in particular Denmark, Sweden and the United Kingdom) account for the bulk of such instruments (see Chart 7). At the end of 2008, the share of these countries in total euro-denominated international bonds and notes had increased to 47.5% (from 45% at

end-2007). At the same time, the share of North American issuers in total euro-denominated international bonds and notes decreased slightly to 23.3% (from 23.9% at end-2007). Nevertheless, these figures underscore that, in

Chart 7 Outstanding volume of international bonds and notes by region

(percentages; fourth quarter of 2008)

other	non-EU Europe
international organisations	new member states
offshore centres	Denmark, Sweden,
Latin America	United Kingdom
Asia & Pacific	Euro area
North America	
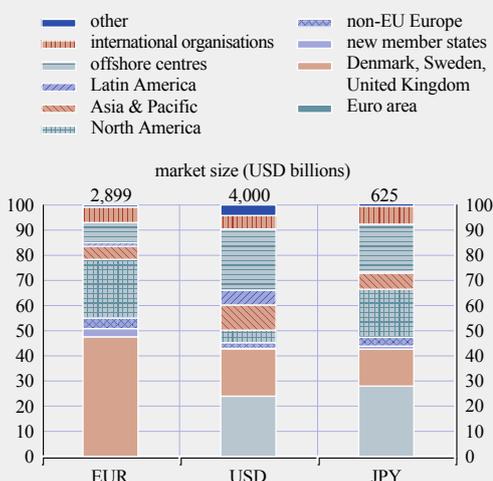
Sources: BIS and ECB calculations.

Chart 8 Euro share in the stock of outstanding international debt securities in selected regions (Q4 2008)

(narrow measure, i.e. excluding home currency issuance; as a percentage of the total amount outstanding)

1 Central and Eastern European EU 5 Asia and Pacific
2 DK, SE and UK   6 Offshore centres
3 North America   7 Latin America
4 Africa   8 Middle East

Sources: BIS and ECB calculations.

addition to the large non-euro area EU countries, other major economic areas such as North America account for a notable share of total euro-denominated debt issued by non-residents.

3.2 THE EURO IN INTERNATIONAL LOAN AND DEPOSIT MARKETS

International loan markets contracted in the fourth quarter of 2008 due to the global financial crisis. The share of the euro in total cross-border loans increased by around one percentage point

to 22.2% when measured at constant exchange rates. Likewise, international deposits contracted during the third and fourth quarter of 2008. The share of the euro in these markets increased by around two percentage points to 22.4% when adjusted for valuation effects.

3.2.1 THE ROLE OF THE EURO IN INTERNATIONAL LOAN MARKETS

Following several years of very strong growth, the cross-border loan market stopped expanding in the course of 2008. The total outstanding amount of cross-border loans by banks to non-financial firms and households continued to increase during the first quarter of the year, but declined in the subsequent quarter.[12] In the fourth quarter, outstanding cross-border loans totalled USD 5.1 trillion, down from USD 6.2 trillion at the end of March 2008 (see Chart 9, left panel).

This decline in outstanding amounts of cross-border loans – implying a virtual drying-up of new loan issuance – can be attributed to the global financial turmoil, and broadly mirrors the reduction in domestic credit expansion observed

12 This decline reflected valuation effects, in particular a decline in the US dollar value of non-US dollar-denominated loans. When adjusting for valuation effects, total cross-border loans increased slightly during the second and third quarters of 2008.

Chart 9 International loan markets: all cross-border loans by currency

(USD billions)

Amounts

— USD
▥ EUR
▬ JPY
▨ other
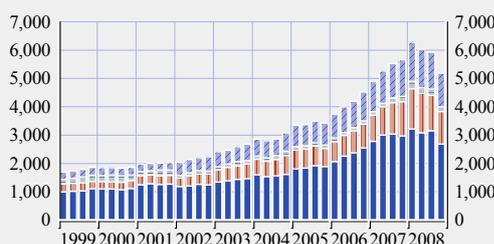
(percentages; at constant exchange rates)

Shares

— USD
···· EUR
-- -- JPY

Source: BIS and ECB calculations.

Chart 10 Cross-border loans between euro area and non-euro area entities

(fourth quarter of 2008)

- US dollar
- euro
- Japanese yen
- pound sterling
- other currencies

**Total cross-border loans (USD billions)
5,190**

Euro area	
Banks	Non-banks

**Total volume (USD billions)
1,245**

8.7%
8.1%
1.7%
43.3%
38.2%

**Total volume (USD billions)
783**

6.3%
4.0%
1.3%
31.6%
56.8%

Non-euro area	
Non-banks	Banks

**Total volume [1] (USD billions)
3,161.5**

24.5%
4.1%
4.3%
7.3%
59.9%

**Total volume [2] (USD billions)
1,312**

21.6%
0.7%
5.9%
17.6%
54.3%
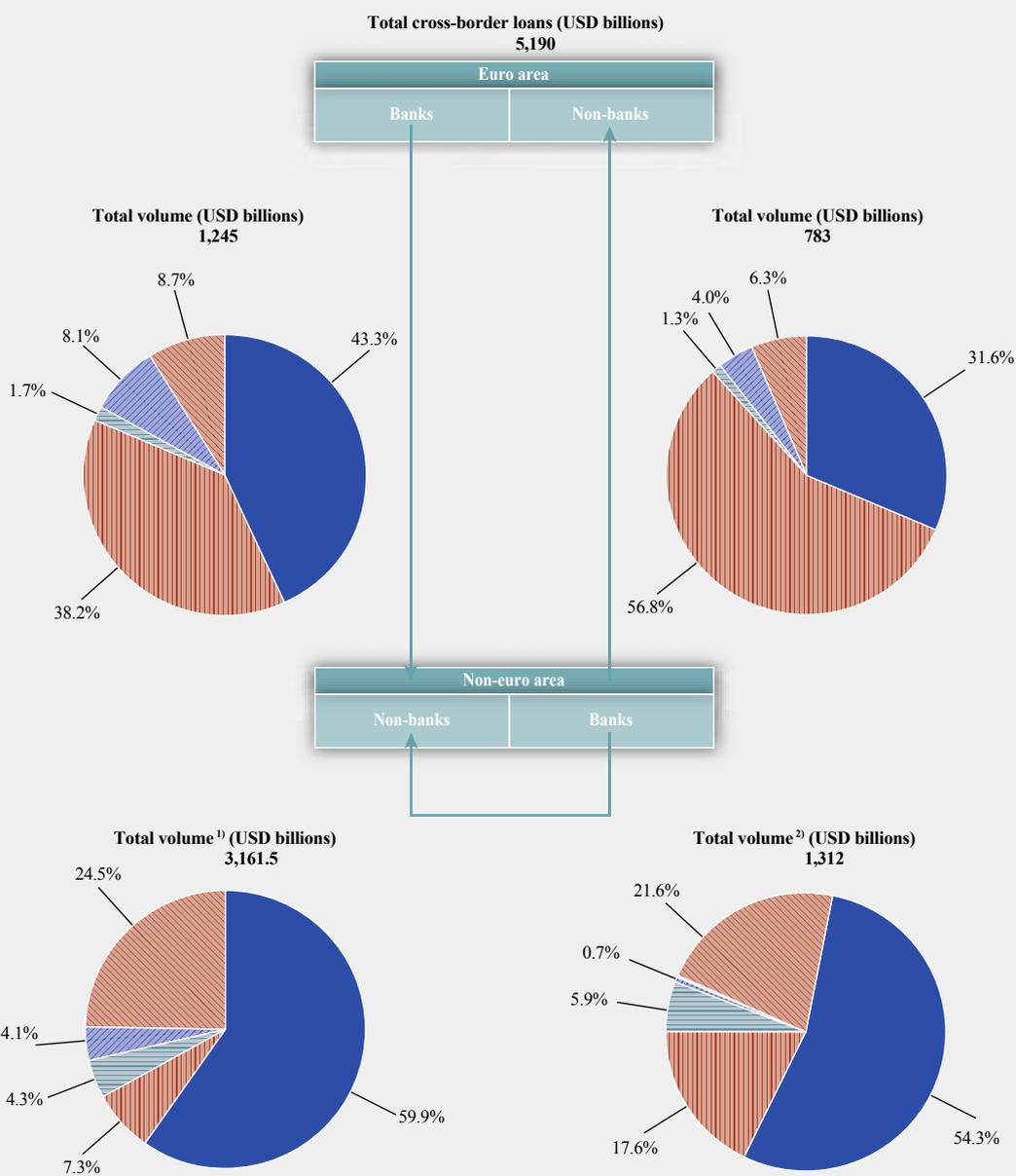
Sources: BIS and ECB calculations.
Note: Excluding interbank loans.
1) Including loans to/from Japan, Switzerland, the United Kingdom and the United States in their domestic currency.
2) Excluding loans to/from Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

within most advanced and emerging market economies. Funding shortages, a generalised increase in risk aversion, and uncertainties about the economic outlook are among the major drivers of the slowdown in international and domestic credit expansion.

At the same time, the crisis did not have a marked impact on the currency composition of total cross-boarder loans, which remained relatively stable throughout the year. As of end-2008, the share of the euro stood at 22.2%, i.e. around one percentage point higher than at end-2007 when accounting for valuation effects (see Chart 9, right panel).

The currency composition of total cross-border loans can be broken down from a euro area perspective into three sub-segments, namely (i) loans by euro area banks to borrowers outside the euro area, (ii) loans by non-euro area banks to borrowers in the euro area and (iii) loans by banks outside the euro area to borrowers outside the euro area. As shown in Chart 10, the share of the euro remained most significant in the second sub-segment, where more than half (56.8%) of the loans were denominated in euro as at the third quarter of 2008. Loans in the first sub-segment were mostly denominated in US dollars, while the euro accounted for 38.2%

of such loans. When considering the share of the euro in loans entirely outside the euro area and comparing it with the share of other major currencies in this market segment, it is appropriate to exclude loans denominated in these currencies from and to the respective home countries (e.g. cross-border US dollar-denominated loans from US banks or to US borrowers are excluded for the purpose of such a comparison; see the currency breakdown on the bottom right of Chart 10).[13] At the end of December 2008, the share of the euro in such "purely international loans" stood at 17.6%.

3.2.2 THE ROLE OF THE EURO IN INTERNATIONAL DEPOSIT MARKETS

As in the case of the cross-border loan market, the global financial turmoil had a significant impact on the cross-border deposit market in the course of 2008.[14] At the end of the fourth quarter of 2008, the total outstanding amount of cross-border deposits, at USD 5.8 trillion, was 16%

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13 In order to arrive at the measure of total cross-border loans presented above, however, such loans are included (i.e. the total on the bottom left of Chart 10 is used).
14 Total cross-border deposits exclude interbank deposits and refer to the sum of deposits by non-euro area residents in euro area banks, deposits by euro area residents in non-euro area banks and deposits made entirely outside the euro area.

Chart 11 International deposit markets: all cross-border deposits by currency

(USD billions)

Amounts
- USD
- EUR
- JPY
- other
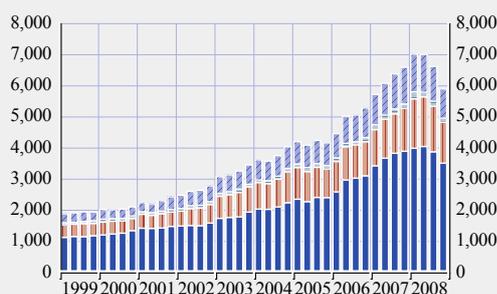
(percentages; at constant exchange rates)

Shares
- USD
- EUR
- JPY
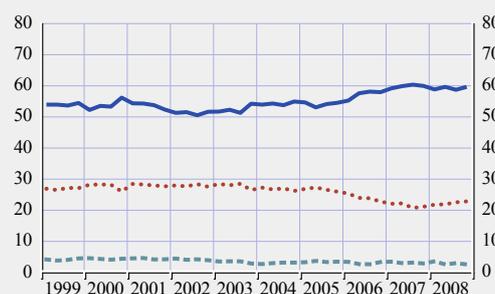
Sources: BIS and ECB calculations.

Chart 12 Cross-border deposits between euro area and non-euro area entities

(fourth quarter of 2008)

- US dollar
- euro
- Japanese yen
- pound sterling
- other currencies

**Total cross-border deposits (USD billions)
5,862**

Euro area	
Banks	Non-banks

**Total volume (USD billions)
1,109**

5.7%
10.0%
1.5%
31.9%
50.8%

**Total volume (USD billions)
762**

10.4%
32.8%
9.1%
1.4%
46.3%

Non-euro area	
Non-banks	Banks

**Total volume[1] (USD billions)
3,991.3**

10.2%
5.4%
2.5%
0.0%
71.9%

**Total volume[2] (USD billions)
1,830**

20.2%
52.3%
2.6%
3.2%
21.7%
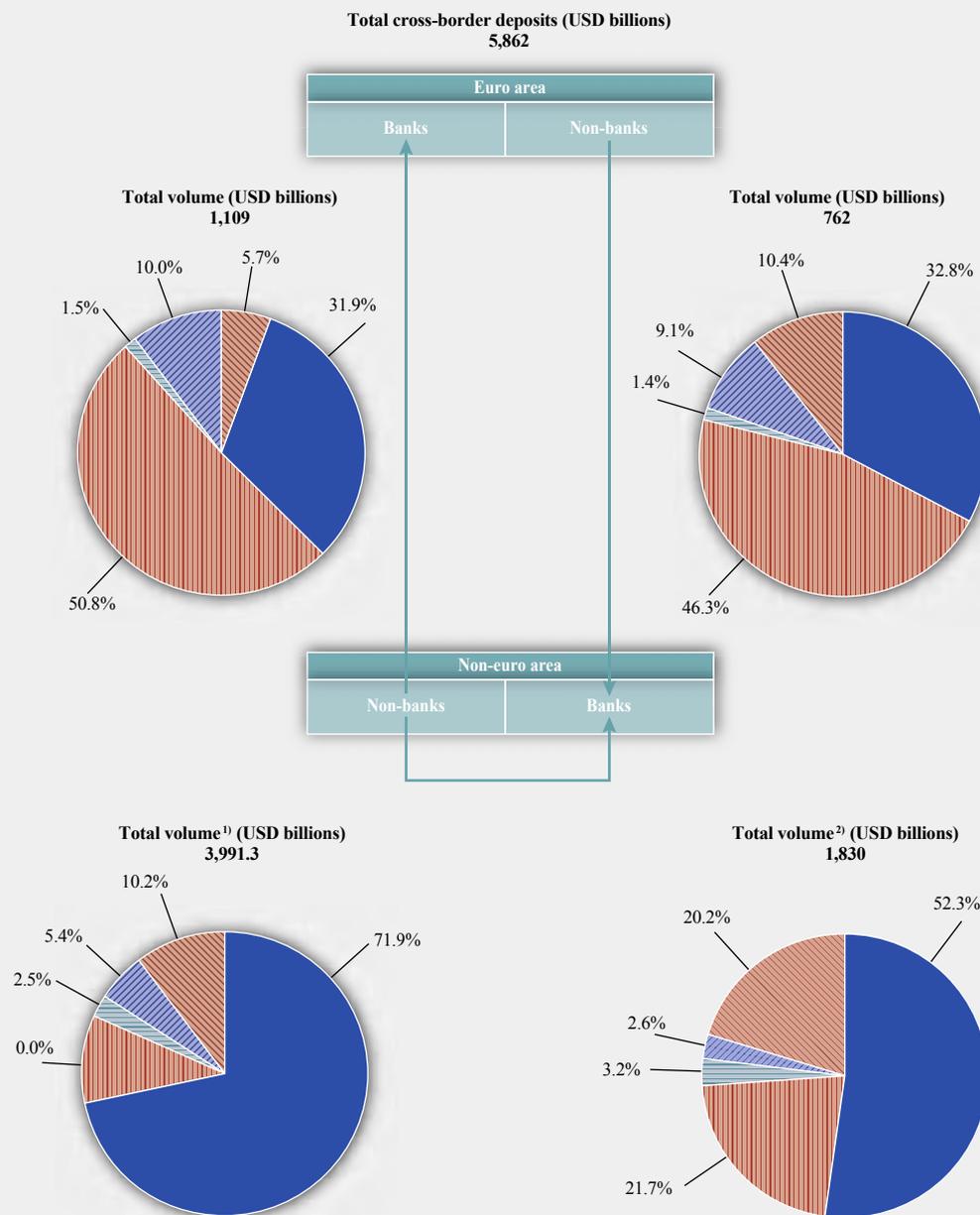
Sources: BIS and ECB calculations.
Note: Excluding interbank deposits.
1) Including deposits in/of Japan, Switzerland, the United Kingdom and the United States in their domestic currency.
2) Excluding deposits in/of Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

below its peak at the end of the first quarter of 2008 (see Chart 11, left panel).[15]

This decline suggests that cross-border deposits have been negatively affected by heightened uncertainty stemming from the intensification of the global financial crisis.

The share of the euro in international deposit markets – after adjusting for valuation effects – increased by around two percentage points to 22.4% in December 2008.

The currency composition of cross-border deposits can be broken down from a euro area perspective into (i) deposits by non-euro area residents in euro area banks, (ii) deposits by euro area residents in non-euro area banks and (iii) deposits made entirely outside the euro area. The share of the euro remained particularly significant in deposits by non-euro area residents in euro area banks (50.8%) and in deposits by euro area residents in non-euro area banks (46.3%). As in the case of international loans, when considering transactions entirely outside the euro area, deposits which are denominated in other major currencies and which are either made by or to residents of the home countries of those currencies are excluded for the purpose of a comparison of the share of the euro with that of other major currencies.[16] At the end of December 2008, the share of the euro in such a measure of "purely international deposits" stood at 21.7%.

3.3 THE EURO IN FOREIGN EXCHANGE AND DERIVATIVES MARKETS

The sometimes substantial disruptions witnessed in foreign exchange and derivatives markets during the period under review, while clearly discernible in transaction volumes and outstanding amounts, had no major impact on the currency composition up to the end of 2008. Indeed, currency shares in the settlement of obligations related to foreign exchange trades as reported by the CLS system[17] were virtually unchanged in 2008, considerable fluctuations

in activity notwithstanding. Similarly, developments observed in derivatives markets by the end of 2008 point to no major changes to the trends prevailing before the onset of the global financial turmoil in the summer of 2007, regardless of the ruptures experienced by some segments of the derivatives markets since then.

3.3.1 FOREIGN EXCHANGE MARKETS

The uninterrupted rise in trading on foreign exchange markets witnessed in previous years appears to have come to a halt in the course of 2008, with available evidence suggesting a contraction towards the end of the review period. Data obtainable from EBS[18] show a decline in volume to a daily average of USD 179 billion in the last quarter of 2008, following transactions

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15 This decline can be explained only to some extent by valuation effects.
16 As in the case of international deposits, in order to arrive at the measure of total cross-border deposits presented above, however, such deposits are included (i.e. the total on the bottom left of Chart 12 is used).
17 The CLS system was launched in September 2002 and is operated by CLS Bank International, a single-purpose bank under the primary supervision and lead oversight of the Federal Reserve System. CLS addresses the problem of foreign exchange settlement risk, settling the two legs of a foreign exchange trade simultaneously on a payment-versus-payment basis, as soon as sufficient funds are available. It is the second largest payment system settling euro transactions after TARGET.
18 Next to Reuters Matching, EBS is the leading electronic trading system in the interbank market for spot foreign exchange transactions (see Gallardo and Heath (2009), pp. 84-85). According to a study conducted by the ECB in 2003, the two systems accounted for around 85% to 90% of these transactions (see ECB (2003), p. 26).

Chart 13 Interbank spot foreign exchange transactions in EBS

(average daily volume; USD billions)

Source: ICAP.

valued at USD 226 billion in the first three quarters (see Chart 13). Notably, volumes seem to have risen significantly with the onset of the financial market turmoil in the summer of 2007, before shrinking considerably in parallel with its intensification in September 2008. The initial surge in trading may be a reflection of heightened activity against the background of the evolving strains in financial markets in combination with the general trend of increasing foreign exchange market volumes. This interpretation is supported in particular by the spike witnessed in September 2008, when average daily volumes rose to USD 274 billion, from USD 202 billion in August, in parallel with the considerable disruptions observed in financial markets during that month.[19] The subsequent drop may have been triggered by a lack of trust among dealers in the interbank spot foreign exchange market comparable with that prevalent in interbank money markets at the time. Additionally, some major market participants such as hedge funds, using prime brokerage services enabling them to trade foreign exchange in the banks' name and with the banks' credit ratings, may have exited the market in the face of growing risk aversion and soaring costs which limited the room for the implementation of their trading strategies.

The fluctuations in transactions conducted via EBS are broadly mirrored by settlement data for obligations related to foreign exchange trades provided by CLS. Indeed, after daily volumes averaging €2.3 trillion between January 2006 and June 2007, activity increased to €2.7 trillion between July 2007 and September 2008, but quickly subsided from €2.9 trillion in October 2008 to €2.4 trillion in December, returning to a level last seen in early 2007 (see Chart 14). Interestingly, however, this rise and fall in settlement volumes did not result in any notable changes in the currency composition, with the US dollar and the euro hovering around 90% and 40% respectively, which was comparatively close to the levels observed before the summer of 2007.[20]

In some segments of the foreign exchange markets, the global financial turmoil resulted in a temporary drying-up of liquidity and caused considerable dysfunctions in normal

19 However, March, June, September and December are also the months in which foreign exchange options and futures are settled. This alone already increases the spot volumes transacted during these months to a sizeable extent.

20 The sum of currency percentage shares reported for foreign exchange markets adds up to 200%, as the two currencies involved in the settlement of one foreign exchange transaction are counted separately.

Chart 14 Settlement volumes in the CLS system

(average daily volume; EUR billions)

Source: CLS.

Chart 15 Currency breakdown of settlement in the CLS system

(average daily volume; percentages[1])
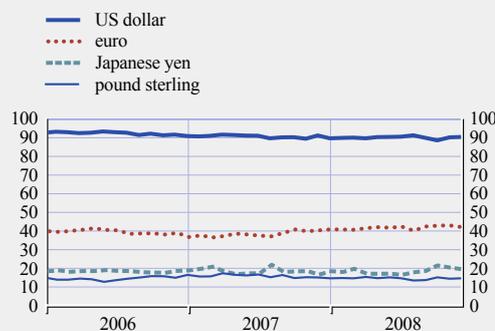
Sources: CLS and ECB calculations.
1) The sum of currency percentage shares adds up to 200% as both currencies involved in the settlement of a foreign exchange trade are counted individually.

market operations. This was in particular the case for some interbank foreign exchange swap markets, making it difficult for banks to refinance their foreign exchange positions. In response to these temporary market disruptions, some central banks established, on an exceptional and case-by-case basis, reciprocal currency swap lines (see Box 1).

CENTRAL BANK RESPONSES TO LIQUIDITY NEEDS IN FOREIGN CURRENCY DURING THE GLOBAL FINANCIAL CRISIS

As a result of the global financial crisis, and especially following its intensification in the autumn of 2008, financial institutions across the world faced increasing liquidity shortages. While the liquidity needs were mostly related to local currency, some financial institutions also faced increasing funding pressures with regard to foreign currency. Foreign currency was required in particular to fund positions that financial institutions had built up in foreign currencies.

This box reviews the policy responses of central banks to these exceptional liquidity needs in foreign currency. Central bank practices typically do not include the provision of foreign currency liquidity, as central banks conduct monetary policy operations denominated exclusively in the currency that they issue. The ECB, for instance, normally conducts monetary policy operations that are exclusively denominated in euro. When private financial institutions face funding needs in foreign currency, they therefore typically do not address central banks, but instead seek foreign currency funding in the markets or, via affiliated institutions, from the central bank issuing the

Swap arrangements between G10 central banks established since mid-2007

(as at June 2009)

Central bank	Currency	Starting date	Until (latest)	Max. amount
ECB providing liquidity to				
Federal Reserve System	EUR:USD	6 Apr. 09	30 Oct. 09	EUR 80 billion
Sveriges Riksbank	EUR:SEK	20 Dec. 07	-	EUR 10 billion
Federal Reserve System providing liquidity to				
Bank of Canada	USD:CAD	18 Sep. 08	1 Feb. 10	USD 30 billion
Bank of England	USD:GBP	18 Sep. 08	1 Feb. 10	Unlimited
Bank of Japan	USD:JPY	18 Sep. 08	1 Feb. 10	Unlimited
European Central Bank	USD:EUR	12 Dec. 07	1 Feb. 10	Unlimited
Swiss National Bank	USD:CHF	12 Dec. 07	1 Feb. 10	Unlimited
Sveriges Riksbank	USD:SEK	24 Sep. 08	1 Feb. 10	USD 30 billion
Bank of England providing liquidity to				
Federal Reserve System	GBP:USD	6 Apr. 09	30 Oct. 09	GBP 30 billion
Swiss National Bank providing liquidity to				
European Central Bank	CHF:EUR	15 Oct. 08	31 Oct. 09 [1]	EUR 25 billion
Federal Reserve System	CHF:USD	6 Apr. 09	30 Oct. 09	CHF 40 billion
Bank of Japan providing liquidity to				
Federal Reserve System	JPY:USD	6 Apr. 09	30 Oct. 09	JPY 10 trillion

Sources: Central bank announcements.
Note: In cases where maximum amounts have been revised, only the most recent amount is indicated.
1) At least until 31 Oct. 09.

currency. With the intensification of the turmoil, however, liquidity on interbank markets as well as in some foreign exchange market segments (swap markets) dried up, and market-based financing in foreign currency became increasingly difficult.[1]

In response to these extraordinary disruptions to normal market functioning, and with a view to supporting the stability of the financial system, some central banks have established, on an exceptional and case-by-case basis, reciprocal currency swap lines. Around end-2007, the Federal Reserve System entered into reciprocal swap arrangements with the ECB and the Swiss National Bank in order to alleviate US dollar financing shortages faced by financial institutions operating in overseas markets. As the crisis became more acute in September 2008, more widespread cross-border foreign currency shortages prompted the conclusion of new inter-central bank currency swap lines. An overview of the arrangements between G10 central banks is provided in the table above.[2] The liquidity arrangements listed in the table have allowed central banks to alleviate exceptional strains in the foreign currency segments of their interbank markets.

In some cases, liquidity support motivated by exceptional strains in foreign currency also took the form of repurchase agreements as opposed to currency swap agreements. The ECB, in particular, established repo arrangements with the Magyar Nemzeti Bank, Narodowy Bank Polski and Latvijas Banka in order to support the euro liquidity-providing operations conducted by those central banks.

1 See also Bernanke (2008) for a discussion of funding pressures in foreign currency and the policy cooperation between major central banks.
2 In addition to the arrangements mentioned in the table, swap arrangements have also been concluded involving non-G10 central banks. The ECB, for instance, entered into a reciprocal swap line with Danmarks Nationalbank on 27 October 2008. See also Ho and Michaud (2008) for an overview of inter-central bank arrangements globally.

3.3.2 DERIVATIVES MARKETS

Following its rapid expansion since the beginning of the decade, activity in global derivatives markets contracted for the first time on an annual basis in 2008, specifically after the intensification of the global financial crisis in the autumn of that year. By the end of 2008, notional principal outstanding had decreased to USD 650 trillion, following a peak of USD 766 trillion in the second quarter of 2008 and the USD 674 trillion recorded at the end of 2007 (see Table 6).

The decline was particularly noticeable in market segments having experienced considerable drops in prices of the assets underlying the corresponding derivatives, such as commodity and equity contracts, which saw

Table 6 Notional principal outstanding in global derivatives markets

(USD billions)

	Organised markets			OTC markets			Total		
	2007 Q4	2008 Q2	2008 Q4	2007 Q4	2008 Q2	2008 Q4	2007 Q4	2008 Q2	2008 Q4
Interest rate derivatives	71,051	73,779	52,711	393,138	458,304	418,678	464,189	532,083	471,389
Foreign exchange derivatives	291	367	220	56,238	62,983	49,753	56,529	63,349	49,973
Equity derivatives	7,735	7,862	4,929	8,469	10,177	6,494	16,205	18,039	11,423
Commodity derivatives	...	...	...	8,455	13,229	4,427	8,455	13,229	4,427
Credit default swaps	...	...	...	57,894	57,325	41,868	57,894	57,325	41,868
Other derivatives	...	...	...	71,146	81,708	70,742	71,146	81,708	70,742
Total	79,078	82,008	57,860	595,341	683,726	591,963	674,419	765,734	649,823

Source: BIS.

a fall in notional principal outstanding of 47.6% and 29.5%, respectively. Similarly, the notional value of credit default swaps (CDS) declined to USD 42 trillion, more than a quarter less than at the end of 2007. Next to the severe credit market strains observed after September 2008, this development is also owed to multilateral terminations of outstanding CDS contracts against the background of the financial market turmoil.[21] However, this decline in notional balances should be interpreted as a reduction of operational risk rather than an actual fall in counterparty risk. Indeed, the market value of outstanding CDS positions, a proxy for counterparty risk,[22] increased to close to USD 6 trillion by the end of 2008, compared with USD 2 trillion at the end of 2007.

Turning to contracts for which a breakdown by currency is available, the share of the euro, net of valuation effects owing to exchange rate fluctuations, increased over the review period. In the market for OTC-traded interest rate derivatives, it rose from 35.6% to 37.0%, mainly against retreating activity in Japanese yen and

currencies from emerging and developing countries [23] (see Chart 16). Likewise, the euro expanded its share from 37.1% to 42.1% among OTC-traded foreign exchange derivatives, where those of the Japanese yen and currencies from emerging and developing countries declined by 4.2 and 1.7 percentage points, respectively (see Chart 17). By contrast, the comparatively stable share of the US dollar, accounting for around 80% of the total, clearly

21 In a multilateral termination, market participants report their outstanding derivatives positions to a central counterparty, which then identifies exposures with identical terms potentially offsetting each other. Subsequently, these contracts are replaced with bilateral arrangements yielding the same net exposures as the initial position, but effectively reducing gross exposures. Such services are offered, for example, by TriOptima, a private company (see BIS (2008), p. 33).
22 In general, net market value, i.e. the value of market participants' CDS positions after collateral, would be the most appropriate measure of counterparty risk. However, timely data with regard to this aggregate are currently unavailable.
23 It has to be noted, however, that the share of currencies from emerging and developing economies is arrived at by computing the difference between the total and the shares of AUD, CAD, CHF, DKK, EUR, GBP, HKD, JPY, SEK, and USD, which might include some currencies of advanced economies not reporting separately, even though their shares are likely to be rather small.

Chart 16 Currency breakdown of OTC interest rate derivatives

(percentages; at constant exchange rates)

— US dollar
···· euro
– – Japanese yen
— other currencies (advanced economies)
···· other currencies (emerging/developing economies)[1]
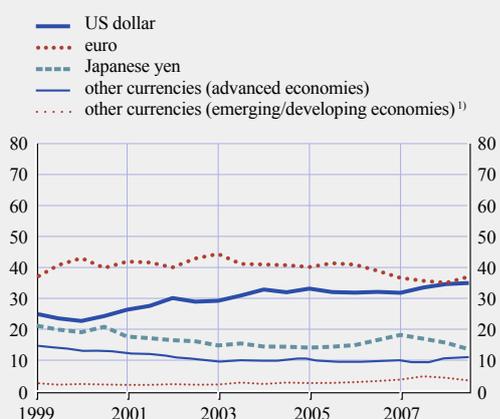
Sources: BIS and ECB calculations.
1) Difference between the total and the shares of AUD, CAD, CHF, DKK, EUR, GBP, HKD, JPY, SEK, and USD. This may include some currencies of advanced economies not reporting separately. Although their shares are likely to be rather small, the figures reported should be seen as an upper bound.

Chart 17 Currency breakdown of OTC foreign exchange derivatives

(percentages; at constant exchange rates)

— US dollar
···· euro
– – Japanese yen
— other currencies (advanced economies)
···· other currencies (emerging/developing economies)[1]
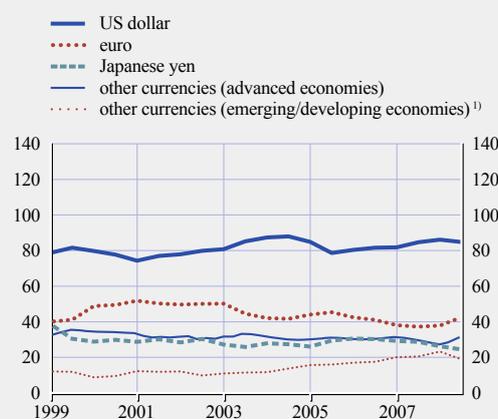
Sources: BIS and ECB calculations.
Note: The sum of currency percentage shares adds up to 200% as both currencies involved in the settlement of a foreign exchange trade are counted individually.
1) Difference between the total and the shares of AUD, CAD, CHF, DKK, EUR, GBP, HKD, JPY, SEK, and USD. This may include some currencies of advanced economies not reporting separately. Although their shares are likely to be rather small, the figures reported should be seen as an upper bound.

reflects its function as a vehicle currency in spot foreign exchange markets.[24] Interestingly, the decline in importance of currencies from emerging and developing economies slightly reverses their rise to prominence observed between the second quarter of 2003 and the second quarter of 2008, when they had expanded their share by twelve percentage points, in line with their heightened visibility in spot foreign exchange market turnover reported in the BIS Triennial Central Bank Survey conducted in April 2007.[25]

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[24] As in the case of spot markets, the sum of currency percentage shares reported for derivatives markets adds up to 200%, as the two currencies involved in the settlement of one transaction are counted separately.
[25] See BIS (2007), p. 10.

Box 2

THE INTERNATIONAL ROLE OF THE EURO IN THE MARKET FOR ASSET-BACKED SECURITIES

The market for asset-backed securities – an overview

From the beginning of the millennium, the market for asset-backed securities (ABSs) experienced unprecedented growth, culminating in a peak in activity in the summer of 2007, immediately before the onset of the global financial crisis. During this period, average quarterly issuance rose from USD 184 billion in 1999 to USD 900 billion in the first two quarters of 2007. This rise was partly facilitated by an abundance of liquidity and historically low interest rates in global financial markets, encouraging market participants to search for superior yields at acceptable risk levels, which ABSs, tailored to almost any desired risk profile through the packaging and re-packaging of their underlying assets, seemed to offer. Furthermore, some interaction with prudential regulatory policies could have played a role, creating incentives for the banking system to reduce its exposure to credit risk and hence its capital requirements.[1] As a consequence, a new model of credit risk transfer gained popularity, enabling credit risk, which so far either had remained intrinsic to loans held by the originating bank or was transferred or shared via credit insurance, loan syndication, loan sales or financial guarantees, to be shifted to third parties, effectively making it a tradable asset.

Under this new model, two basic configurations for transferring credit risk from one party to another gained ground. First, true securitisations which involved the sale of loans to special purpose vehicle corporations (SPVs) and conduits. These SPVs were set up for the very purpose of buying these loans, potentially reshuffling their risk and cash flow profiles via the creation of a variety of tranches, each offering different characteristics with regard to these profiles in order to make them attractive for a certain group of buyers, and financing this purchase by issuing in turn their own debt, i.e. the actual (tranches of) ABSs. Second, synthetic securitisations which isolate the credit risk from the underlying loan, consequently creating a separately negotiable claim. Contrasting the use of the first and the second method, Chart A illustrates that the latter, represented by notional amounts outstanding of credit default swaps (CDSs), one of the most common contracts enabling the synthetic transfer of risk, was considerably larger at the end of 2008 (USD 41.9 trillion) than the ABS segment (USD 18.8 trillion).[2] However, since the vast majority of CDS deals take place in OTC markets, detailed characteristics of these transactions are difficult to obtain. Thus, the following analysis exclusively focuses on the market for ABSs.

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[1] See Calomiris (2008), p. 31 and p. 73.
[2] Figures reported by the BIS for the CDS market do not, however, present a fully comprehensive picture, as participation in the data collection yielding these statistics is voluntary. Notably, CDSs written by AIG or the monoline insurers are not included in the data.

Chart A Global amounts outstanding of credit transfer products

(USD billions)

Credit defaults swaps

Asset-backed securities
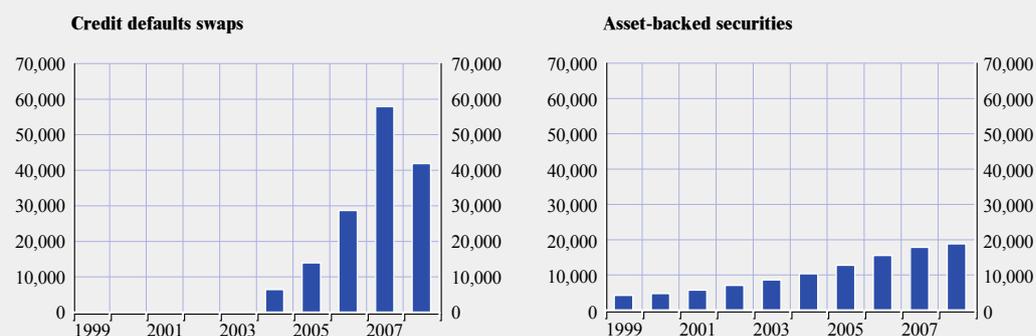
Sources: BIS, Thomson Reuters and ECB calculations.
Notes: Data for credit default swaps refer to notional amounts outstanding and are unavailable before 2004. Global amounts outstanding of ABSs are approximated by summing the principal of all securities issued between 1980 and the respective year shown in the chart, less the principal of all securites which matured between 1980 and that year.

Over the period 1999 to 2008, a total of USD 17.6 trillion of ABSs was issued on a global scale, more than two-thirds of which by issuers located in the United States (see Table). After the United States, the euro area (10.6%), the United Kingdom (9.6%) and offshore centres (7.2%) also accounted for a significant share of the market. Turning to the currency of denomination of these securities, the largest proportion (85.4%) was issued in the currency of the country in which the issuer resided. Notably, almost all issuance originating in the United States (99.5%) was denominated in US dollars. By contrast, ABSs issued by SPVs established in offshore centres were mainly denominated in US dollars (89.3%), euro (4.0%) or Japanese yen (5.1%). Similarly, a comparatively high proportion of securities issued in Australia and the United Kingdom were denominated in non-domestic currencies.

The two main drivers behind these developments in the global ABS market appear to be the availability of underlying assets that can be securitised and the absorption capacity of domestic financial markets. In the United States, in particular, the country's sizeable debt stock and

Global issuance of asset-backed securities, 1999-2008

| | Total issuance | | Currency (percentages) | | | | | | |
	(USD billions)	(percentages)	Domestic	USD	EUR	JPY	GBP	CHF	Other
United States	11,983	67.9	99.5	...	0.3	0.0	0.1	0.0	0.0
Euro area	1,867	10.6	95.3	3.0	...	0.2	1.4	0.0	0.2
United Kingdom	1,689	9.6	46.9	23.0	29.6	0.1	...	0.1	0.3
Offshore centres	1,262	7.2	0.6	89.3	4.0	5.1	0.9	0.0	0.1
Australia	306	1.7	59.7	26.9	12.6	0.0	0.8	0.0	0.0
Japan	271	1.5	96.6	3.3	0.1	...	0.0	0.0	0.0
South Korea	80	0.5	83.6	12.1	3.9	0.2	0.0	0.0	0.2
Canada	80	0.5	79.6	17.9	2.5	0.0	0.0	0.0	0.0
Other countries	107	0.6	52.5	21.8	25.5	0.0	0.0	0.0	0.3
Total	**17,644**	**100.0**	**85.4**	**9.6**	**3.7**	**0.4**	**0.3**	**0.0**	**0.1**

Source: Thomson Reuters.

the large domestic investor base may explain the high level of total issuance.[3] Conversely, in offshore centres, the pattern of ABS issuance – based on assets originating from third countries and ABSs denominated in currencies of prospective investors – may be explained by a lack of assets and limited absorption capacity in local markets. This lack of appropriate circumstances notwithstanding, offshore centres still managed to attract a considerable share of the ABS market, presumably owing to their relatively light regulation and favourable tax regimes, which probably also partly explains the comparatively strong position of the United Kingdom and Australia.

The international role of the euro in ABS markets

Contrasting issuance in domestic currency with that in a currency different from that of the country in which the issuer resides, which is equivalent to the (narrow) definition of international issuance applied to the market for debt securities, shows that the market for international ABSs accounts for a comparatively minor share of the total. Additionally, considering developments over time, it seems that this segment primarily came to prominence in the later stages of the current credit cycle (see Chart B). Finally, only a few currencies in the ABS markets are truly internationalised, meaning that global issuance in the respective currency considerably surpasses the issuance by market participants for which it is the domestic currency (see Chart C). According to this classification, the euro was the most internationalised among the major currencies, both at the peak of the credit cycle in 2007 and after the onset of the global financial crisis in 2008. Its sizeable international use was driven to a large extent by the United Kingdom, which accounted for around three-quarters of euro-denominated ABSs issued outside the euro area between 1999 and 2008 (see also the table above). The US dollar ranked second in 2007 and 2008, chiefly owing to the extent of domestic issuance activity, which dwarfs international issuance in US dollars. Remarkably, the Japanese yen's ratio dropped from 2.55 in 1999 to 1.03 in 2008, indicating a significant reduction in its

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3 Implicitly, this line of reasoning is based on the assumption that domestic investors always prefer to hold securities denominated in domestic currency. Additionally, it presumes that the currency of denomination of the ABSs issued is at all times equivalent to that of the underlying collateral. In fact, neither is the case. However, even if some investors do not favour their own currency, it appears reasonable to suppose that a substantial number do in order to avoid exposure to exchange rate risk. Furthermore, multi-currency ABSs, where the currency of denomination of the ABSs does not match that of the underlying collateral, do not make up the major part of the global ABS market, although their share is not negligible.

Chart B Issuance of asset-backed securities

(USD billions)

- international issuance
- domestic issuance
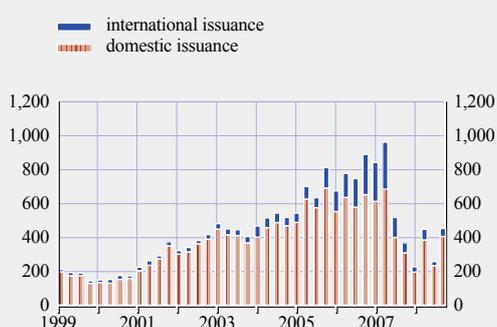
Source: Thomson Reuters.

Chart C Internationalised currencies in the asset-backed securities market

- 1999
- 2007
- 2008
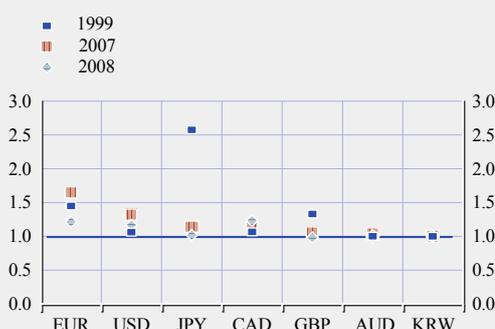
Sources: Thomson Reuters and ECB calculations.
Note: A ratio of 1.0 implies that global issuance in the respective currency equals the issuance by market participants for which it is the domestic currency.

international use. Similarly, the pound sterling recorded a ratio only marginally above unity by 2008. These shifts in the international use of currencies since 1999 are also paralleled by the development of their shares in the issuance of international ABSs (see Chart D).

Net of valuation effects owing to exchange rate fluctuations, the share of the US dollar increased from 41.1% in the first quarter of 1999 to a high of almost 76% by the end of 2006, reducing those of other major currencies accordingly. From 2007, however, the share of the US dollar started to fall, precipitously so after the onset of the credit market turmoil in the summer of 2007. This retrenchment in US dollar-denominated ABS issuance accompanied a general collapse in activity,

Chart D Issuance of international asset-backed securities: currency shares

(percentages; at constant exchange rates)

- USD
- EUR
- JPY
- GBP

Sources: Thomson Reuters and ECB calculations.

with total new issuance in 2008 only a quarter of that witnessed in the course of 2007.[4] The decline was concentrated in the US dollar-denominated segment, as the mortgage market[5] in the United States and the country's financial system were the first to be affected by the repercussions of the crisis. By contrast, issuance in euro, despite contracting by 46% between 2007 and 2008, held up comparatively well, resulting in a rise in the share of the euro to 58.8% in the last quarter of 2008, while that of the US dollar declined to 38.0%. This resilience of the euro may be related to the fact that the underlying (mortgage) markets in (some parts of) Europe were less affected by the crisis than those in the United States. It may also reflect the response of issuers to the treatment of ABSs in the collateral framework across different central banks. However, this possibly temporary attractiveness of the euro has to be seen in the context of the falling issuance in US dollars, as a rebound in the latter might quickly reverse some of the developments seen in 2007 and 2008. Nevertheless, it may suggest that the inertia usually witnessed with regard to the use of currencies in an international context can evaporate in the presence of market disruptions on the scale observed in ABS markets.[6]

4 Over the same period, issuance of US dollar-denominated ABSs dropped by 88%.
5 While aggregate data do not always allow a proper assessment of the nature of the collateral underlying the ABSs, at least a third of the USD 2.5 trillion of international ABSs issued between 1999 and 2008 were backed by some sort of residential or commercial mortgages.
6 Although this inertia is more prevalent in stock data than in the issuance data considered in this box, it is worth noting that a parallel analysis conducted for the currencies of issuance in the market for international debt securities does not generally show fluctuations on the scale observed in ABS markets since the intensification of the financial crisis in September 2008.

3.4 THE EURO IN INTERNATIONAL TRADE IN GOODS AND SERVICES [26]

Since its launch in 1999, the euro has steadily increased its share in the settlement and invoicing of trade in those countries for which data are available, a trend that broadly continued to persist in 2007.[27] In addition to the regional concentration of the use of the euro in countries located in the neighbourhood of the euro area or with institutional links to the euro area or the EU,

a closer analysis of available data, also against the background of further countries joining the euro area between 2007 and 2009, reveals that network externalities and the choice of exchange rate regime may also influence euro-denominated invoicing and settlement of trade in countries outside the euro area.

26 This section is based on data collected by the ESCB and publicly available data from several non-EU countries.
27 For an overview of available data concerning the currency of denomination of trade flows, see Box 3.

Chart 18 The euro's share as a settlement/invoicing currency in extra-euro area merchandise trade

(as a share of total exports)

(as a share of total imports)

- 2001
- 2006
- 2007
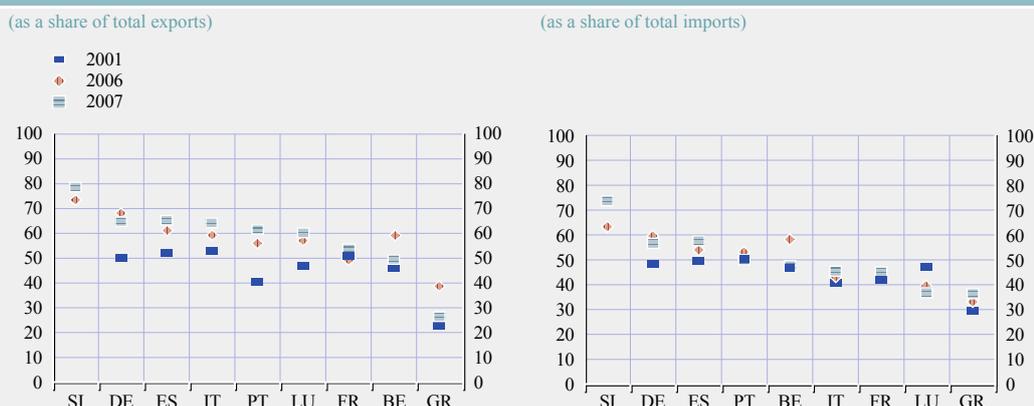
Sources: National central banks and ECB calculations.
Note: Data for Slovenia are unavailable before 2006; earliest data for Germany refer to 2002; 2007 data for Belgium are not comparable to previous years.

3.4.1 THE ROLE OF THE EURO IN THE INTERNATIONAL TRADE OF EURO AREA COUNTRIES

Most euro area countries expanded their use of the euro in the trade of goods (see Chart 18) and services (see Chart 19) with countries outside the euro area in 2007.[28] Consequently, the euro's share in merchandise exports ranged from 39.2% (Greece) to 79.0% (Slovenia) in 2007, after ranging between 38.8% (Greece) and 74.2% (Slovenia) in 2006, which compares with just 23.5% (Greece) to 52.7% (Italy) in 2001. Corresponding figures for merchandise imports were recorded at 34.9% to 73.1% in 2007,

28 In Belgium, the share of the euro dropped by 9.5 and 11.0 percentage points for merchandise exports and imports, respectively. This decrease is the result of a change in methodology, notably a switch from settlements based data to custom data, which allows to better capture invoicing behaviour. For trade in services, where the past trend remains unchanged, the methodology is unchanged and the estimates are still based on the same source as before.

Chart 19 The euro's share as a settlement/invoicing currency in extra-euro area trade of services

(as a share of total exports)

(as a share of total imports)

- 2001
- 2006
- 2007
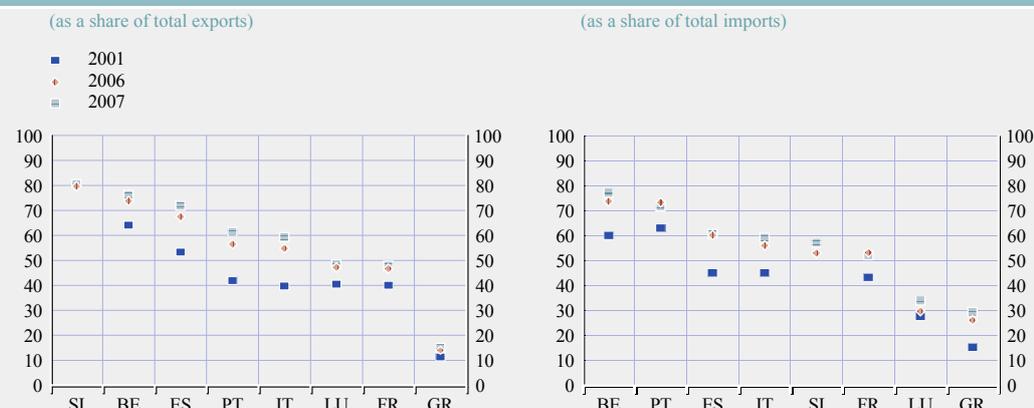
Sources: National central banks and ECB calculations.
Note: Data for Germany are unavailable; data for Slovenia are unavailable before 2006; earliest data for Belgium and Luxembourg refer to 2002.

following 33.6% to 64.0% in 2006, with Greece and Slovenia again constituting the lower and upper bounds respectively, contrasting with shares of between 29.3% (Greece) and 50.3% (Portugal) in 2001. [29]

29 The equivalent figures for services exports were 14.9% (Greece) to 80.8% (Slovenia) in 2007, after 14.6% (Greece) to 80.1% (Slovenia) in 2006 and 11.3% (Greece) to 53.3% (Spain) in 2001. Services imports ranged from 29.5% (Greece) to 77.2% (Belgium) in 2007, following 26.2% (Greece) to 73.8% (Belgium) in 2006 and 15.3% (Greece) to 63.1% (Portugal) in 2001.

Box 3

INVOICING AND SETTLEMENT CURRENCIES IN INTERNATIONAL TRADE: AN OVERVIEW OF AVAILABLE DATA

Ten years after the introduction of the euro, information about the currency denomination of invoicing or settlement of international trade flows continues to be scarce, considerable data collection efforts by the ESCB notwithstanding. In fact, data are obtainable for less than a third of global merchandise trade transactions in 2007 (see table).

Detailed evidence has been gathered mainly for members of the euro area or the EU as well as for those countries aspiring to EU accession. For euro area members, the settlement or invoicing currency of exports and imports is known for almost 40% of the total trade volume, whereas this ratio is close to a third for the remaining EU countries. For other regions, data coverage falls to a mere 5.4%, even though these accounted for more than 60% of global trade in 2007.

Currency denomination of global merchandise trade: data availability

		2001	2007
Euro area countries	(USD billions)	3,755	8,145
Currency denomination of trade known	(percentages)	(22.6)	(39.2)
Non-euro area EU countries	(USD billions)	1,145	2,698
Currency denomination of trade known	(percentages)	(20.7)	(32.6)
Other countries	(USD billions)	7,624	17,329
Currency denomination of trade known	(percentages)	(3.9)	(5.4)
Total	**(USD billions)**	**12,523**	**28,171**
Currency denomination of trade known	**(percentages)**	**(18.2)**	**(28.9)**

Sources: IMF and ECB calculations.

3.4.2 THE ROLE OF THE EURO IN THE INTERNATIONAL TRADE OF THIRD COUNTRIES

For countries outside the euro area, the euro's share in the settlement and invoicing of merchandise trade in 2007 was largest in countries which are located in the vicinity of the euro area or have institutional links with the euro area or the EU, as in previous years (see Chart 20). Developments otherwise closely resembled those observed for euro area members.

Over the review period, the share of the euro in the invoicing or settlement of merchandise trade increased by between 0.1 percentage point (Romania, Slovakia and Ukraine) and 4.7 percentage points (Latvia) for exports, whereas it rose by 0.2 percentage point (Czech Republic) to 8.3 percentage points (Slovakia) for imports. A reduction in the role of the euro was confined to a few countries, namely Cyprus, Poland and the former Yugoslav Republic of Macedonia (exports) and Cyprus, Romania and Turkey (imports).

Chart 20 The euro's share in merchandise trade of non-euro area countries

(as a share of total exports)

- 2001
- 2006
- 2007

1 SK   4 RO   7 LT   10 HR   13 UA
2 CZ   5 LV   8 CY   11 MK   14 TH
3 PL   6 EE   9 BG   12 TR   15 ID

(as a share of total imports)

1 SK   4 LV   7 LT   10 HR   13 UA
2 RO   5 PL   8 CY   11 MK   14 ID
3 CZ   6 EE   9 BG   12 TR   15 TH
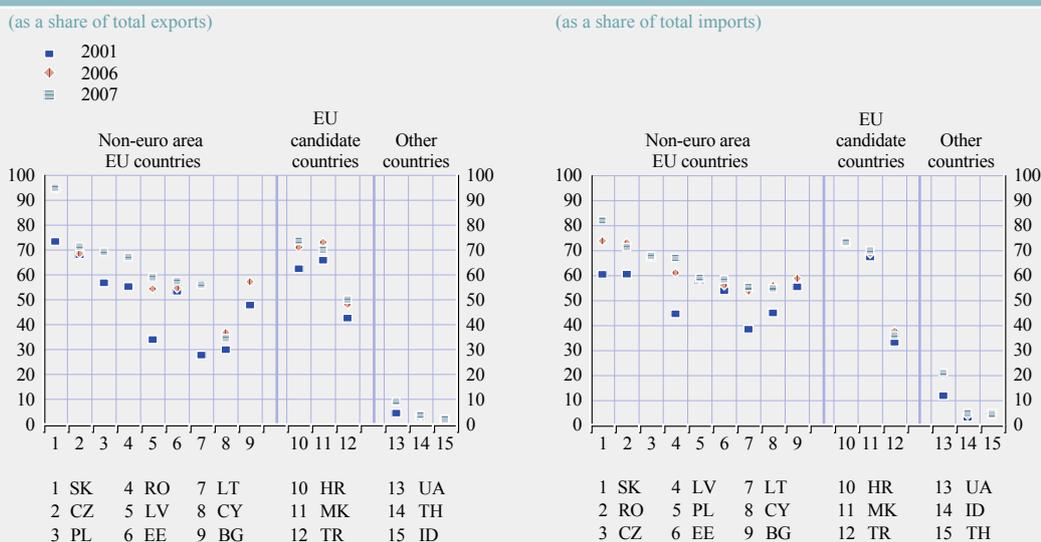
Sources: National sources and ECB calculations.
Note: Data for Bulgaria are unavailable for 2007; earliest data refer to 2002 for the former Yugoslav Republic of Macedonia, the Slovakia and Ukraine, and to 2003 for Cyprus; data for Cyprus refer to the period before the euro was adopted; data for Indonesia refer to non-oil and gas trade only.

The comparatively low level of the euro as the currency of denomination in Cyprus' trade in the years preceding the country's adoption of the euro in 2008 stands in contrast to corresponding data for Slovenia and Slovakia before their entry into the euro area in 2007 and 2009 respectively (see Chart 21). For the latter two countries, the share of the euro in their exports and imports significantly surpassed the euro area's share in their volume of trade, whereas this relationship seems to be considerably closer in the case of Cyprus. Although this discrepancy may possibly be explained to a sizeable extent by factors such as Cyprus' strong trade links with the United Kingdom and the high share of petroleum and petroleum products in its trade,[30] it may also suggest that the adoption of the euro alone was insufficient to trigger a shift in the currency denomination of trade flows with non-euro area countries to the euro. In fact, being geographically close to other countries using the euro, which is the case for Slovenia and Slovakia, but not for Cyprus, may also play a role. This could suggest the existence of network effects in international trade, with the

location of a country in a region using a particular currency for the invoicing or settlement of trade in turn encouraging the use of this currency in that country's own trade.

This finding also seems to be confirmed by contrasting the share of merchandise trade denominated in euro with the share of merchandise trade conducted with the euro area. For those non-euro area countries for which data are available, Chart 22 shows that the ratio of these shares is generally higher for countries which neighbour the euro area. More importantly, however, it is usually above unity, as well as being similar for those countries which are geographically close to each other, such as Estonia, Latvia and Lithuania, Romania and Bulgaria, the Czech Republic and Poland, or Croatia and the former Yugoslav Republic of Macedonia. This implies that network externalities might play some part, as the share of these

30 Although data on the currency denomination of Cyprus' trade with the United Kingdom are not available, it is likely to be primarily denominated in pounds sterling. Trade of petroleum and petroleum products is generally denominated in US dollars.

(as a share of total trade)

■ trade with the euro area
▬ trade denominated in euro

Cyprus

Slovenia

Slovakia

Sources: IMF, national sources and ECB calculations.

Chart 22 Trade denominated in euro as a ratio of trade with the euro area

■ 2001
▮ 2007

1 LV	6 CZ	10 TR
2 LT	7 PL	11 UA
3 EE	8 HR	12 TH
4 RO	9 MK	13 ID
5 BG		
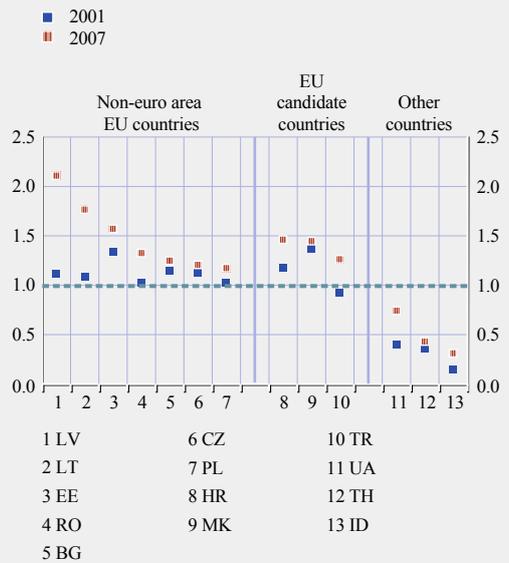
Sources: IMF, national sources and ECB calculations.
Note: Earliest data refer to 2002 for the former Yugoslav Republic of Macedonia and Ukraine; latest data refer to 2006 for Bulgaria.

countries' trade with the euro area alone does not warrant the use of the euro to the extent indicated by the data. In addition, the gradual rise in euro invoicing or settlement in relation to trade with the euro area between 2001 and 2007 could be connected to a deepening of this effect over time.

Nevertheless, to substantiate this proposition, an in-depth analysis of a more comprehensive set of countries and currencies appears warranted, which is currently hampered by a lack of sufficient data. Therefore, alternative explanations of the observed developments, such as exchange rate regimes based on the euro, cannot be excluded. Indeed, the currency board arrangements of Estonia, Latvia and Lithuania, as well as the tightly managed floating exchange rates of Croatia and the former Yugoslav Republic of Macedonia, seem to result in higher ratios than those of countries with more flexible exchange rates.[31] Together with the sizeable degree of balance sheet euroisation of their economies, this may make the payment of exports and imports in euro advantageous, both for domestic firms and for their foreign trading partners, which are to a large extent located in the euro area, with the

31 Bulgaria, which maintains a currency board with the exchange rate of the lev pegged to the euro, has to be seen as an outlier in this respect.

euro effectively serving as a proxy for payment in domestic or an alternative internationally accepted currency, at least if these exchange rate regimes are perceived to be credible. Thus, the denomination of trade flows in euro in excess of the need determined by transactions with the euro area may be seen as an equivalent to the foreign currency denomination of loans, deposits and external borrowing in the financial sphere.

Another potential justification, however, namely that these countries are able to impose euro-denominated invoicing or settlement on their non-euro area trading partners in line

with Grassmann's law,[32] is unlikely to lend support to the observed data, since the euro, despite its importance in their respective economies, is not their domestic currency. Furthermore, owing to their comparatively small size, it is probable that the ability of firms resident in these countries to dictate business conditions to their trading partners is at best limited.

[32] Grassman's law states that trade between developing and industrialised countries is predominantly invoiced in the latter's currency (producer currency pricing), as firms with more bargaining power will choose their own currency to avoid exchange rate risk (see Grassman (1973)).

Box 4

EXCHANGE RATE PASS-THROUGH AND THE INTERNATIONAL ROLE OF THE EURO

The transmission of exchange rate fluctuations to trade and domestic prices, known as exchange rate pass-through, is well-documented in the macroeconomic literature. A good understanding of pass-through is important to study developments in inflation, trade flows and current account positions. The degree of pass-through is generally found to depend on macroeconomic factors, including the overall inflationary environment (Taylor (2000)) and the exchange rate regime (Coricelli et al. (2006)), and microeconomic factors, including mark-up practices, pricing-to-market strategies, the degree of market competition and the level of competitors' prices in destination markets.[1] Bussière and Peltonen (2008) review the factors behind cross-country differences in the degree of exchange rate pass-through.

Some researchers have found that the degree of pass-through may also be influenced by invoicing and settlement practices in international trade. In particular, Goldberg and Tille (2005) show that the widespread use of the US dollar in global trade invoicing could be a possible theoretical explanation of a low pass-through to US import prices (expressed in US dollars) and the generally low responsiveness of the US economy to exchange rate shocks.[2] Empirical evidence in support of such a link is provided by Gopinath and Rigobon (2007).

This box examines whether a similar link between invoicing practices and exchange rate pass-through can be identified for the euro area. Some first indirect evidence may be obtained by examining aggregate pass-through estimates for the euro area, in particular their development over time. Given that the euro has become more prominent as a settlement and invoicing currency in international trade (see section 3.4), exchange rate pass-through to euro area trade prices (expressed in euro) is expected to be declining over time. While estimates vary within the

1 Campa and González Mínguez (2006) argue that when the market where goods are sold is highly competitive, a producer opts for local currency pricing. When the producer is powerful enough, producer currency pricing is used instead.
2 According to Faruqee (2006), US import prices change by around 18% in response to exchange rate shocks. Campa and Goldberg (2005) find higher pass-through estimates of about 40%.

literature,[3] some studies indeed find evidence of a decline in pass-through to euro area prices (expressed in euro) over recent years (Ihrig et al. (2006) and di Mauro et al. (2008)). This finding is compatible with the increasing role of the euro in third countries' trade invoicing.

The link between invoicing and pass-through can be examined more thoroughly using bilateral trade data between the euro area and its trade partners. In principle, differences in invoicing practices across trade partners should, ceteris paribus, translate into differences in bilateral pass-through. To examine this, two sets of data are collected and compared across around 20 trade partners of the euro area: [4]

x-axis: share of contracts invoiced in euro
y-axis: exchange rate pass-through

Source: ECB staff calculations.

– the euro's share in the invoicing or settlement of trade, drawing on data provided by Kamps (2006) and updated with data from this review;

– estimates of long-run exchange rate pass-through in bilateral trade between the euro area and third countries. Such bilateral estimates are not widely available in the literature – presumably mainly as a result of insufficient availability of bilateral trade prices[5] – and are therefore estimated, based on import price equations where the euro area import price index (p)[6] is a function of its past values, the nominal bilateral exchange rate (s), producer price indices approximating prices of producers (hp) and competitors' prices on the destination market (fp),[7] using the following baseline specification: [8]

$$p_t = c + \alpha p_{t-1} + \beta_0 s_t + \gamma f p_t + \delta h p_t + \varepsilon_t$$

From this specification, a measure of long-run exchange rate pass-through can be derived. The estimation results point to a negative correlation between currency invoicing and long-run exchange rate pass-through to euro area import prices, as expected. Long-run exchange rate pass-through to euro area import prices is found to be small in euro area trade with partner countries from central and eastern Europe, where the euro has a high share of overall invoicing.

3 Using price indices aggregated across industries and countries, estimates of long-run pass-through to euro area trade prices range from 50% (Hahn (2003)) to 117% (Faruqee (2006)). Using a panel framework, where the regression input is disaggregated by industry and by country, Anderton (2003) finds that long-run pass-through to the euro area prices of manufacturing imports from seven major trade partners ranges from 50% to 70%.

4 The number of countries is mainly limited by the availability of data on trade invoicing.

5 Existing econometric studies focus on pass-through to aggregated extra-euro area trade prices, i.e. for trade with the whole world, or, in the context of bilateral trade, they cover only countries which are relatively homogeneous with respect to invoicing practices. María-Dolores (2008) is an exception, providing pass-through estimates both by industry and by country, which are also the focus of the present analysis. Interestingly, the author finds considerable heterogeneity across countries and industries for euro area trade with non-euro area EU Member States and Turkey.

6 For this purpose, bilateral export and import unit values were computed, based on data from Eurostat's COMEXT database.

7 For countries where producer price indices (PPIs) are not available at monthly frequency, consumer price indices are used instead. While domestic and foreign PPIs represent only a rough approximation of producers' and competitors' prices, domestic PPIs are generally included in export price equations and foreign PPIs are used in import price equations (see, for example, di Mauro et al. (2008)).

8 The robustness of the results is tested by using two alternative specifications, where lagged trade prices are replaced by two or four lags of exchange rates respectively. De Brandt et al. (2007) suggest accounting for cointegration. Econometric tests, however, find that a number of cointegrated equations vary substantially across countries and are also sensitive to test assumptions.

However, it is significant, at around 40%, in the case of imports originating from Canada, Russia and the United States, countries where invoicing in euro remains very limited (see chart above). While one should be cautious in interpreting these findings as evidence of causality, the results do suggest a negative correlation between the share of trade denominated in euro and pass-through to euro area import prices.

Results for specific countries also underline the influence of industry-specific practices. In euro area imports from Algeria, for instance, pass-through is around 50%. This may be related to the product composition of bilateral trade, with imports from Algeria being concentrated in raw materials, notably energy, for which invoicing is largely conducted in US dollars.

In conclusion, it appears that the international use of the euro in trade invoicing has a marked impact on exchange rate pass-through. Broadly speaking, the degree of exchange rate pass-through to euro area import prices is low when a substantial portion of trade is invoiced or settled in euro. With the important caveat that this analysis is based only on correlations, rather than on structural relationships, the results suggest that the increasing role of the euro in trade invoicing may have a bearing on the long-run relationship between exchange rate fluctuations and price developments in the euro area over time.

4 THE EURO IN THIRD COUNTRIES

This section reviews the role of the euro in third countries, i.e. countries outside the euro area. As regards official uses of the euro in third countries, the section focuses on the use of the euro in foreign exchange reserves held by other central banks.[33] With regard to private use of the euro as a parallel currency, this section provides updated information on the use of euro banknotes (currency substitution) and the use of euro-denominated bank deposits and loans (asset substitution) outside the euro area.

4.1 OFFICIAL USE: THE EURO IN THIRD COUNTRIES' FOREIGN EXCHANGE RESERVES

In 2008 the share of the euro in global foreign exchange reserves increased somewhat to 26.5% as central banks of several emerging market economies defended their currency pegs mainly by selling reserve assets denominated in US dollars. As in the past, these figures refer only to countries which disclose the currency composition of their foreign exchange reserves to the IMF and cover around two-thirds of global foreign exchange reserves. At the same time, new analytical findings confirm that "transaction considerations" have played a major role at the global level and among the central banks of some non-euro area EU Member States and emerging market economies that disclose the currency composition of their foreign exchange reserves.

During the period under review, the pattern of global reserve accumulation trends changed notably during the second half of 2008. Until June 2008 global foreign exchange reserves continued to rise – at an accelerating pace during the first quarter and a lower pace during the second quarter – and reached a peak of USD 7.0 trillion at the end of June 2008. During the third and fourth quarters of the year, global foreign exchange reserves fell by around USD 300 billion (or 4.3% of their peak level) as some emerging market central banks used their foreign exchange reserves to ease depreciation

pressures on their currencies and the dollar value of non-US dollar-denominated reserves declined owing to the appreciation of the US dollar.[34] Despite these developments, global foreign exchange reserves stood at end-2008 USD 6.7 trillion higher than at end-2007 (USD 6.4 trillion).

Against this backdrop, it has been argued that the global financial crisis may have led central banks to reassess their investment strategies and to refocus on liquidity as opposed to return considerations in their reserve management (Royal Bank of Scotland (2009)). To some extent, such reasoning can be rationalised by portfolio considerations that take due account of the objective to hedge against sudden stops in capital inflows (ECB (2008); Beck and Rahbari (2008)). In such a framework, a decline in reserve levels would increase the relative importance of "transaction motives".

However, according to the IMF's Currency Composition of Official Foreign Exchange Reserves (COFER) database, which covers the currency composition of around two-thirds of global foreign exchange reserves, the share of major reserve currencies remained relatively stable during 2008. This observation should be interpreted with caution since, according to the IMF, Asian countries in particular do not disclose the currency composition of their foreign exchange reserves (ECB (2005)). Keeping this caveat in mind, the share of the euro, when measured at constant end-2008 exchange rates, decreased slightly during the first quarter of 2008 and then increased somewhat during the remainder of the year (see Table 10 of the statistical annex) as

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33 Information regarding the use of the euro as an anchor currency, i.e. as a point of reference for the exchange rate policy of third countries, can be found in Table 9 of the statistical annex.

34 Developments discussed in this sub-section refer to the IMF's quarterly Currency Composition of Official Foreign Exchange Reserves database. According to monthly figures for foreign exchange reserves derived from the IMF's International Financial Statistics, foreign exchange reserves reached their lowest level in October 2008 (around 6.5% lower than in July 2008).

Chart 23 Currency composition of global foreign exchange reserves

(USD trillions)

(in percent; at constant end-2008 exchange rates)

Amounts
- USD
- EUR
- JPY
- other currencies
- undisclosed

Shares
- USD
- EUR
- JPY

Sources: IMF and ECB calculations.
Note: Latest data are for Q4 2008.

US dollar-denominated reserves decreased relative to reserves denominated in other currencies (see Chart 23).

As argued in ECB (2008), such aggregate figures on the currency composition of global foreign exchange reserves may reflect changes in the relative weight of individual reserve-holding countries rather than changes in currency preferences. In particular, it is conceivable that emerging market central banks which intervened to defend their currencies during the second half of 2008 mainly did so by selling US dollar-

denominated assets, since a large share of foreign exchange reserves appear to be held by countries which manage their exchange rate against the US dollar.[35]

Whether, in addition to such "composition effects", currency preferences have also changed is difficult to assess using aggregate data. One

35 According to Lim (2006), in the third quarter of 2005, around two-thirds of foreign exchange reserves with a known currency composition were held by countries which use the US dollar as a point of reference in their exchange rate policy.

Table 7 Relative variability of currency shares in global foreign exchange reserves

(Q1 1999 – Q4 2008)

	Standard deviation			Coefficient of variation		
	At current exchange rates (A)	At constant exchange rates (B)	Ratio (B as % of A)	At current exchange rates (C)	At constant exchange rates (D)	Ratio (D as % of C)
USD	3.0	1.3	44.1	4.4	2.0	45.3
GBP	0.8	0.5	68.1	23.5	22.5	95.4
JPY	1.2	1.2	105.8	27.6	19.6	71.0
CHF	0.1	0.1	152.7	31.3	33.7	107.8
EUR	3.3	1.8	54.3	14.8	7.8	53.0
Other currencies	0.2	0.3	126.2	13.8	16.8	121.7
Average (weighted geometric)	**2.7**	**1.3**	**50.0**	**6.7**	**3.5**	**51.8**
Simple weighted average	**2.8**	**1.4**	**48.5**	**8.6**	**5.3**	**61.9**

Sources: IMF/COFER database and ECB staff calculations.
Note: The standard deviation and the coefficient of variation of currency shares have been computed using quarterly COFER data for all countries which disclose their currency composition to the IMF for the period Q1 1999 to Q4 2008.

way of gauging the relative importance of portfolio motives versus transaction motives in central bank reserve management is to compare the relative variability of currency shares at current and constant exchange rates. For example, a portfolio in which currency shares are more stable at current than at constant exchange rates can be seen as one which is mainly driven by portfolio motives (Rogers (1993)). As documented in ECB (2008), the evidence available until end-2007 suggested that aggregate currency shares in the IMF's COFER database were on average more stable at constant than at current exchange rates, suggesting that central bank reserve managers tended to place more emphasis on transaction considerations. Extending this analysis to end-2008 suggests that these trends continued throughout the onset of the global financial crisis (see Table 7).

Evidence from the few central banks that publish the currency breakdown of their reserves (see the statistical annex for a complete data overview) suggests that during the period under review, the share of the euro displayed no uniform pattern (see Chart 24).

An econometric analysis suggests that transaction considerations have played a major role among the central banks of EU Member States and emerging market economies that disclose the currency composition of their foreign exchange reserves (see Box 5). In particular, between 1999 and 2007, the rise in the share of the euro in the central bank reserves of some central and eastern European EU Member States was mainly driven by a shift towards exchange rate arrangements

Chart 24 Share of the euro in foreign exchange reserves of selected countries

(at constant Q4 2008 exchange rates; percentages)

- end-2007
- end-2008

1 Bulgaria	6 Sweden	11 Switzerland
2 Croatia	7 United Kingdom	12 United States
3 Latvia	8 Russia	13 Chile
4 Lithuania	9 Canada	14 Peru
5 Slovakia	10 Norway	15 Uruguay
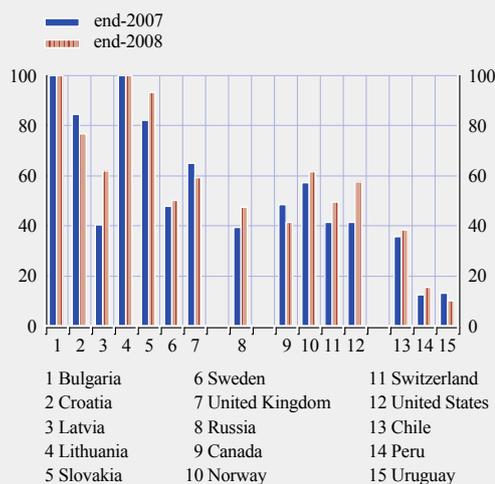
Sources: National central banks and ECB calculations.
Notes: Figures for Sweden refer to currency benchmarks as published in Sveriges Riksbank's Annual Report. Figures for the United Kingdom refer to combined currency shares for the Bank of England and the UK government and refer to January 2008 instead of December 2007 and October 2008 instead of December 2008. Data for the United States refer to combined currency shares for the System Open Market Account at the Federal Reserve and the US Treasury Exchange Stabilization Fund. In the case of Norway, currency shares refer to the fixed income part of Norges Bank's foreign exchange reserve portfolio. It is assumed that currency allocations broadly correspond to geographic allocations. Data for Chile refer to the combined currency shares in the liquidity and the investment portfolio of the Central Bank of Chile. In the case of Peru, the share of the euro refers to reserve assets denominated in currencies other than the US dollar. According to the Central Reserve Bank of Peru, these are mostly euro-denominated assets.

using the euro as a point of reference and an increasing weight of the euro in the denomination of external debt. Among the Latin American countries which disclose the currency composition of their reserves, the slight increase in the share of the euro has tended to be driven by somewhat increasing trade with the euro area.

EMPIRICAL DETERMINANTS OF THE CURRENCY COMPOSITION OF RESERVES: NEW EVIDENCE FROM A PANEL OF EU MEMBER STATES AND EMERGING ECONOMIES

Empirical studies on the currency composition of foreign exchange reserves have been hampered by a lack of data availability at the country level (ECB (2008); Beck and Rahbari (2008)). Two notable exceptions are the studies by Dooley, Lizondo and Mathieson (1989) and Eichengreen and Mathieson (2000), for which the authors had access to confidential country-level data from

the IMF's COFER database. In these papers, it has been documented that exchange rate pegs, trade flows and the currency composition of external debt are robust empirical determinants of the currency composition of foreign exchange reserves in emerging and transition economies. More recent empirical papers on the currency composition of reserves have focused on the characteristics of the reserve currencies (such as low inflation, and large and liquid capital markets) rather than those of the countries that hold reserves (Chinn and Frankel (2006) and (2008)). Against this background, this box provides new empirical evidence on the determinants of the currency composition of the reserves of a panel of central banks from eight EU Member States and emerging market economies (Chile, Croatia, Latvia, Lithuania, Peru, Uruguay, Bulgaria and Slovakia) which disclose the currency composition of their reserves. In addition to "transaction motives" stemming from emergency import and debt financing needs and anchor currency considerations, portfolio motives are considered as a possible empirical determinant of the currency composition of reserves.

The share of the euro and the US dollar in the foreign exchange reserve holdings of country i is estimated according to the following relationship:

$$\mathrm{Re}\ s\_c_{it} = \lambda_0 + \lambda_1 Debt\_c_{it} + \lambda_2 Trade\_c_{it} + \lambda_3 FXanchor\_c_{it} + \lambda_4 R^e\_c_{it} + \varepsilon_{it}$$
$$c = EUR,\ USD$$

where $\mathrm{Re}\ s\_c_{it}$ denotes the share of international currency c in total reserves of country i at time t (rescaled to two currencies only), $(Debt\_c_{it})$ is the adjusted share of external debt denominated in currency c,[1] $Trade\_c_{it}$ is the share of the country issuing currency c in the total external trade (sum of imports and exports) of country i, $FXanchor\_c_{it}$ is a dummy variable taking value one if the currency of country i is pegged to currency c and zero otherwise, $R^e\_c_{it}$ denotes the expected returns from holding currency c in the reserve portfolio and ε_{it} is the error term. In order to take into account different degrees of exchange rate flexibility vis-à-vis currency c, two variants are considered for the anchor currency dummy[2] variable. As regards portfolio motives in reserve management, three alternative measures of expected returns in euro or US dollars are considered. A first measure is the net expected depreciation (NEED) computed from the respective forward and spot rates and corrected for mean reversion as in Hsieh and Romer (2001). The second measure of expected returns is the euro-US dollar forward premium computed from the three-month forward rate and the spot closing rate. Finally, the euro-US dollar short-term interest rate differential is taken into account.

Tables A and B report the results from panel tobit regressions which were performed for the euro and the US dollar share in foreign exchange reserves. Models 1 and 2 refer to the basic specification using only transaction motives augmented by the broadly defined peg dummy (model 1) and the hard peg (model 2) dummy. The other variants for each model additionally include the three measures of expected returns described above.

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1   The adjusted share is computed as the residual from a panel tobit partial regression of debt denominated in currency c against $Trade\_c_{it}$ and $FXanchor\_c_{it}$, in order to deal with the high correlation between the currency denomination of liabilities, trade and the fixed parity against that currency (the correlation is 0.83 at the panel level).

2   The first specification distinguishes between very broadly defined exchange rate pegs (including currency boards, dollarisation regimes, conventional fixed pegs, and pegged exchange rates within horizontal bands, crawling pegs and crawling bands) and floating regimes (including managed floating with no predetermined path for the exchange rate and independently floating currencies), whereas the second dummy variable assigns a one only in the case of currency boards and dollarisation regimes.

Table A Determinants of the euro's share in reserve holdings

(dependent variable: reserves denominated in euro; percentages)

Variables	Model 1	Model 1a (nedd)	Model 1b (fs)	Model 1c (i diff)	Model 2	Model 2a (nedd)	Model 2b (fs)	Model 2c (i diff)
Debt EUR	0.50***⁾ (0.03)	0.47***⁾ (0.03)	0.54***⁾ (0.03)	0.54***⁾ (0.03)	0.32***⁾ (0.02)	0.26***⁾ (0.02)	0.36***⁾ (0.02)	0.36***⁾ (0.02)
Trade EA	0.34***⁾ (0.11)	0.24**⁾ (0.11)	0.34***⁾ (0.11)	0.34***⁾ (0.11)	0.09 (0.09)		0.08 (0.08)	0.08 (0.08)
Peg EUR	0.29***⁾ (0.01)	0.26***⁾ (0.02)	0.28***⁾ (0.01)	0.28***⁾ (0.02)				
Hard Peg EUR					0.65***⁾ (0.02)	0.63***⁾ (0.02)	0.68***⁾ (0.02)	0.68***⁾ (0.02)
Exp. Return EUR		2.97***⁾ (0.68)	5.20***⁾ (1.30)	1.30***⁾ (0.33)		4.09***⁾ (0.49)	7.82***⁾ (0.94)	1.95***⁾ (0.24)
No of obs.	579	579	579	579	579	579	579	579

Source: ECB calculations.
Observation summary: 0 left-censored observations, 47 uncensored observations, 5 right-censored observations. Only statistically significant coefficients are reported. ***) denotes significance at 1%, **) denotes significance at 5% and *) denotes significance at 10%.

As the estimation results show, transaction motives enter with statistically significant coefficients and are robust to the inclusion of dummy variables for exchange rate pegs and of expected returns measures. The expected positive signs of all coefficients indicate that the more one country trades, has debt denominated in, or pegs to a given currency, the more likely it is to hold reserves in that currency. Expected returns also enter with a positive and statistically significant sign, suggesting that return motives also play a role in the reserve management of the respective countries.

Computing the contribution of the various coefficients to the fitted currency shares suggests that the rise in the share of the euro in the non-euro area EU Member States has been mainly driven by exchange rate arrangements using the euro as a point of reference and the denomination of external debt in euro. The US dollar share, on the other hand, can mainly be explained by the currency denomination of debt, in particular among the Latin American countries in the sample. Finally, the contribution of return motives to the fitted reserve currency shares has overall been small for the euro and the US dollar.

Table B Determinants of the US dollar's share in reserve holdings

(dependent variable: reserves denominated in US dollars; percentages)

Variables	Model 1	Model 1a (nedd)	Model 1b (fs)	Model 1c (i diff)	Model 2	Model 2a (nedd)	Model 2b (fs)	Model 2c (i diff)
Debt USD	0.43***⁾ (0.03)	0.36***⁾ (0.03)	0.46***⁾ (0.02)	0.46***⁾ (0.02)	0.32***⁾ (0.02)	0.26***⁾ (0.02)	0.36***⁾ (0.02)	0.36***⁾ (0.04)
Trade US					0.08 (0.09)		0.08 (0.08)	0.08 (0.08)
Peg USD	0.46***⁾ (0.01)	0.44***⁾ (0.02)	0.49***⁾ (0.01)	0.49***⁾ (0.02)				
Hard Peg USD					0.65***⁾ (0.02)	0.63***⁾ (0.02)	0.68***⁾ (0.02)	0.68***⁾ (0.02)
Exp. Return USD		4.39***⁾ (0.55)	9.58***⁾ (1.04)	2.40***⁾ (0.26)		4.13***⁾ (0.49)	7.81***⁾ (0.94)	2.83***⁾ (0.41)
No of obs.	579	579	579	579	579	579	579	579

Source: ECB calculations.
Observation summary: 5 left-censored observations, 47 uncensored observations, 0 right-censored observations. Only statistically significant coefficients are reported. ***) denotes significance at 1%, **) denotes significance at 5% and *) denotes significance at 10%.

4.2 PRIVATE USE: THE EURO AS A PARALLEL CURRENCY IN THIRD COUNTRIES

Over the review period, the role of the euro in currency and asset substitution increased markedly outside the euro area. Regarding currency substitution, available statistics on net shipments of euro banknotes to destinations outside the euro area suggest a strong increase in 2008 in foreign demand to the highest level observed since 2002. This strengthening was in particular visible in the months following the intensification of the financial turmoil in mid-September 2008, suggesting that a large share of the net shipments abroad reflected additional demand by non-residents in an environment of heightened global financial uncertainty.

As regards asset substitution, the share of the euro in total foreign currency deposits increased during the review period in most non-euro area EU Member States and EU candidate countries. This trend occurred against the backdrop of an increase in asset substitution also towards other foreign currencies.

With respect to borrowing in foreign currency, the global financial crisis has underscored the risks associated with unhedged borrowing by households and corporations. A currency depreciation against the euro or the US dollar will lead to an increase in the borrowing costs of these economic agents. Nevertheless, borrowing in euro remained notably high and even increased further during 2008 in most countries in EU neighbouring regions.

4.2.1 CURRENCY SUBSTITUTION – THE USE OF EURO BANKNOTES OUTSIDE THE EURO AREA

The use of euro banknotes outside the euro area cannot be estimated with full precision. One estimate for the lower bound of the amount of euro banknotes circulating abroad as published regularly in this review is the accumulation over time of net shipments of euro banknotes by euro area monetary financial institutions (MFIs) to destinations outside the euro area.

According to this measure, around €95 billion worth of euro banknotes were estimated to be in circulation outside the euro area at the end of December 2008, around 13% of the euro banknotes in circulation for that reference month (see Chart 25).

This estimate is considered to be a lower bound, given that the banking channel is only one of a number of channels for euro banknotes shipped outside the euro area. Indeed, anecdotal evidence suggests that the outflows of euro banknotes via non-MFI channels (for example, via tourism or workers' remittances) are often greater than the backflow of euro banknotes via non-bank channels, creating an incomplete picture of the true banknote flows. A more realistic assumption might thus be that around 10% to 20% (and potentially a figure closer to the upper end of the range) of euro currency in circulation was circulating outside the euro area at the end of 2008. According to the statistics on net shipments of euro banknotes to destinations outside the euro area, in 2008 foreign demand increased to the highest level since 2002. This strengthening was in particular visible in the months following the intensification of the financial turmoil in mid-September 2008. This pattern suggests that a large share of the net shipments abroad reflected additional demand by

Chart 25 Net shipments of euro banknotes to destinations outside the euro area

(EUR billions; adjusted for seasonal effects)

initial frontloading (left-hand scale)
monthly shipments (left-hand scale)
cumulative shipments (right-hand scale)
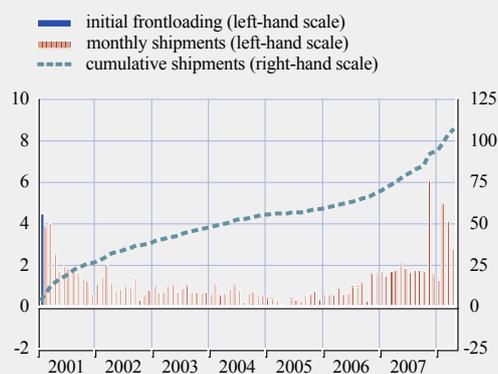
Source: Eurosystem.
Notes: Net shipments = euro banknotes sent abroad minus euro banknotes received. The last observation is for March 2009.

non-residents in an environment of heightened global financial uncertainty. Indeed, the increase in net shipments largely resulted from increased gross shipments of currency abroad rather than lower retentions. The broadly unchanged return flows following the strong demand in late September and early October 2008 indicate that, while the increased demand normalised somewhat, it did not unwind in the following months.[36]

The use of euro banknotes outside the euro area continues to be concentrated to a considerable extent in euro area neighbouring regions, in part owing to the proximity of the euro area, which makes it convenient to hold euro banknotes, e.g. for purchases in euro area countries. Other reasons are the expectation that the euro will become legal tender in some of these countries in a few years, and traditions, in particular concerning the use of the Deutsche Mark (see also Box 6 for an overview of the outcome of the regular survey conducted by the Oesterreichische Nationalbank). Evidence from a number of sources suggests that euro banknotes are increasingly used in countries east of the EU, mainly as a store of value and for large transactions.

Judging from the development of the euro banknote trade figures obtained from globally active banknote wholesale banks, the use of euro banknotes in other parts of the world also seems to be increasing, although volumes remain relatively moderate. Chart 26a shows the regions outside the euro area from which banknote wholesale banks [37] purchased euro banknotes in 2008. Purchases from regions in Europe, especially from eastern European countries, accounted for 59% of total purchases. A considerable share (23%) of euro banknotes were purchased from the region "Asia and Australia", of which inflows from East Asia, owing to tourism and trade, constituted the major part. The Middle East accounted for 9%

36 Further evidence can be taken from statistics by third countries. The Bank of Russia, for instance, publishes data on foreign currency brought into and taken out of Russia by authorised banks. These statistics show that the net shipment of euro banknotes increased considerably in 2008, and in particular in the last quarter, to levels well above those observed in previous years. At the same time, the outflows of US dollar banknotes on a net basis observed in 2006 and 2007 continued until mid-2008 but reversed substantially in the last quarter of the year, leading to overall higher holdings of US dollar currency.

37 The figures were reported by 35 globally active banknote wholesale banks, serving most of the foreign currency market. As some wholesale banks have not always provided detailed statistics, the data are partially based on estimations.

Chart 26 Regional breakdown of euro banknote purchases from and sales to destinations outside the euro area (2008)

a) Purchases 2008

b) Sales 2008

Source: ECB, based on data from banknote wholesale banks.
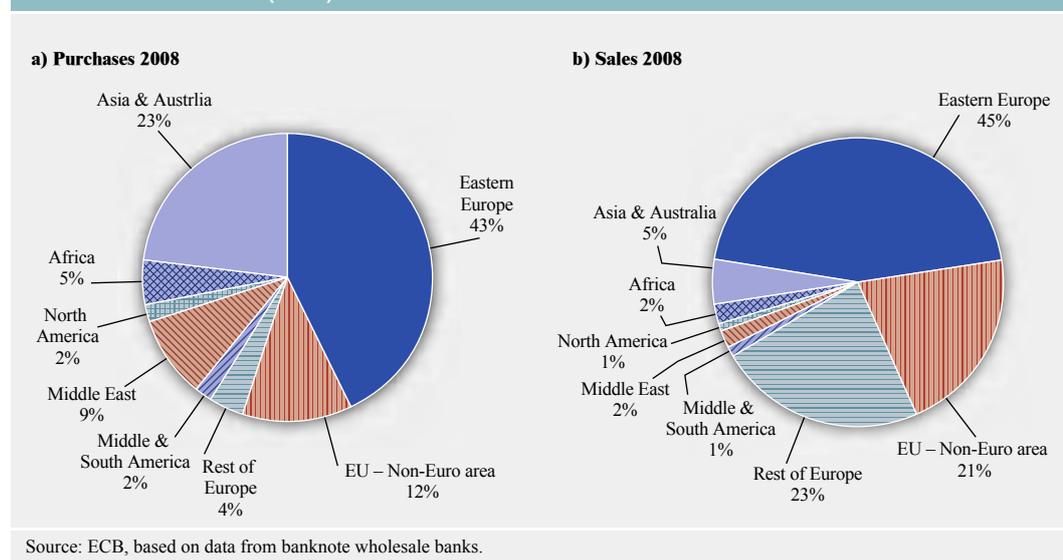
of all euro banknote purchases, presumably reflecting the supply from international market-places, such as Dubai, where goods are traded with consumers from all over the world against cash. Chart 26b shows the regions outside the euro area to which banknote wholesale banks sold euro banknotes in 2008. The bulk of banknotes (89%) were sold to European countries, especially to "eastern Europe" (particularly Russia and Turkey), "EU – non-euro area" (largely the United Kingdom) and the "rest of Europe" (mainly Switzerland).

In 2007 the Oesterreichische Nationalbank (OeNB) launched a new survey on foreign currency holdings, the OeNB Euro Survey, which has been conducted at half-yearly intervals since then.[1] The most recent survey (October/November 2008) was conducted at the time of the first peak in the global financial crisis and its arrival in the region. Therefore, this contribution focuses on initial evidence of households' reactions to the crisis by comparing the most recent results with those of the preceding survey waves.

The main finding prior to the crisis was that a high proportion of respondents in south-eastern Europe held euro cash, and that the amounts held were comparatively large. While the share of respondents holding euro cash was also considerable in central and eastern Europe, the amounts reported were substantially lower.[2] This may be explained by differences in the motives for holding euro cash in central and eastern Europe (mainly for shopping abroad) as opposed to south-eastern Europe (mainly as a store of value).

Scheiber and Stix (2008) measure the degree of currency substitution as foreign currency cash holdings as a percentage of total currency in circulation. The results confirm the substantial role of foreign currency cash holdings in south-eastern Europe. Estimated foreign currency circulation ranges from 2% to 22% of total currency in circulation in the EU Member States and from 27% to 76% in the Balkan countries. Within the latter group, the results suggest two clusters: in the former Yugoslav Republic of Macedonia and Serbia, the shares exceed two-thirds, while Albania, Bosnia and Herzegovina and Croatia record shares of around 30%. These high shares of the euro in total currency circulation are striking, especially considering that the underlying figures result solely from survey answers (and in particular stated amounts). As it is likely that the survey responses understate true holdings, the degree of currency substitution is likely to be even higher.

1 The geographical scope of the survey comprises 11 countries, namely six EU Member States (Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia) and five EU candidate and potential candidate countries (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, and Serbia). The survey does not cover Montenegro and Kosovo, which have both unilaterally introduced the euro. In each country, about 1,000 people over the age of 14 are personally interviewed (for further details, see ceec.oenb.at).

2 Median amounts of euro cash holdings ranged from €90 to €230 in central and eastern Europe, and from €380 to €730 in south-eastern Europe.

In view of the timing of the third survey wave, the question arises as to whether the global financial crisis induced any shifts in household portfolios as regards foreign currency cash holdings. The responses indicate that the national shares of respondents holding euro cash remained stable compared with the average percentage shares recorded in the 2008 spring and 2007 fall surveys. Hence, the dissemination of euro cash holdings in central, eastern and south-eastern Europe remained unaffected in the early days following the arrival of the global financial crisis in the region (see the chart).

Furthermore, the amounts of euro cash holdings reported in the survey stayed broadly unchanged. Changes in the median amount of euro cash holdings between the spring 2008 and the fall 2008 surveys were statistically insignificant, except in the case

Euro cash holdings as in fall 2008

(as a percentage of respondents)

Source: OeNB euro survey 2007 fall wave, 2008 spring wave and 2008 fall wave.

of Croatia. However, the major change in amounts of cash holdings reported in Croatia seems to have taken place at an earlier stage, i.e. in the first half of 2008: the median amount of euro cash was found to be around €470 in autumn 2007, before soaring to €870 in spring 2008 and reaching a level of €920 in autumn 2008, which was the highest in the region at the time. One explanation for this temporal pattern could be that residents had already sold a substantial share of their equity holdings in spring 2008 and had converted a sizeable share of the resulting revenues into euro cash.

The fact that no significant changes in foreign currency holdings became evident at the time of the fall 2008 survey wave does not imply, however, that households are not concerned about the potential impact of the crisis. Responses to questions in the OeNB Euro Survey on economic sentiment, which were also included in the fall 2008 questionnaire, clearly reveal that respondents are considerably affected by financial turmoil and show a significant deterioration in their assessment of the economic situation as compared with previous waves. In a similar vein, results on exchange rate expectations and trust in the banking sector were considerably more pessimistic (for details, see Dvorsky, Scheiber and Stix (2009)). Therefore, it seems conceivable that the emergence of an acute crisis situation could lead to a reshuffling of portfolios.

Against this background, it remains a key policy challenge – both in the euro area and in the central, eastern and south-eastern European countries outside the euro area – to sustain overall trust in the banking system. The 2009 spring wave of the OeNB Euro Survey was to be conducted in May/June 2009 and will shed further light on the influence of the global financial crisis on households' behavioural patterns.
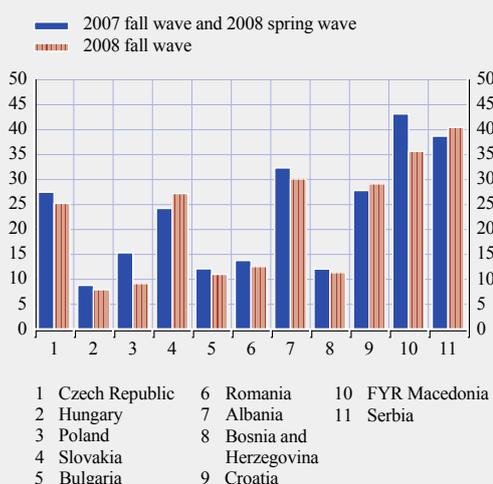
4.2.2 ASSET SUBSTITUTION – THE USE OF EURO-DENOMINATED BANK DEPOSITS AND LOANS

Economic agents in central, eastern and south-eastern Europe increasingly use the euro for domestic financial transactions. In general, the use of a foreign currency as a store of value has been explained by past macroeconomic instability (ECB (2007)). In central, eastern and south-eastern Europe, several specific factors may have supported the role of the euro as the preferred currency for asset substitution, namely the geographical proximity of the euro area – implying trade, financial, migration and tourism links – the institutional anchor of prospective EU and euro area membership, as well as the role of the euro as an external anchor in some of these countries' exchange rate policies.

As in previous years, this review reports two measures related to the use of the euro in the denomination of deposits and loans in non-euro area countries: its share in total foreign currency deposits (loans) and its share in total deposits (loans) including domestic assets (liabilities). Whereas the first measure provides an indication of the role of the euro in asset (liability) substitution compared with other currencies, the second indicator refers more closely to the use of foreign currencies and asset (liability) substitution in general.

Over the review period, the share of the euro in total foreign currency deposits increased in most non-euro area EU Member States and EU candidate countries, with the exception of Croatia, where it decreased slightly, albeit from a high level (see Chart 27a). In the case of Slovakia, this increase in the share of the euro may have been associated with the anticipation of euro area membership as of 1 January 2009. This trend took place against the backdrop of an increase in asset substitution in general (see Chart 27b). In fact, the share of the euro in total deposits has tended to increase in most central and eastern EU Member States and EU candidate countries, with the exception of countries in which asset substitution is less pronounced owing to relatively flexible exchange rate regimes (Czech Republic, Poland and Turkey). [38]

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38 In addition, asset substitution slightly decreased in Slovakia and Montenegro.

Chart 27 The share of the euro in the deposits of selected EU Member States and EU candidate countries
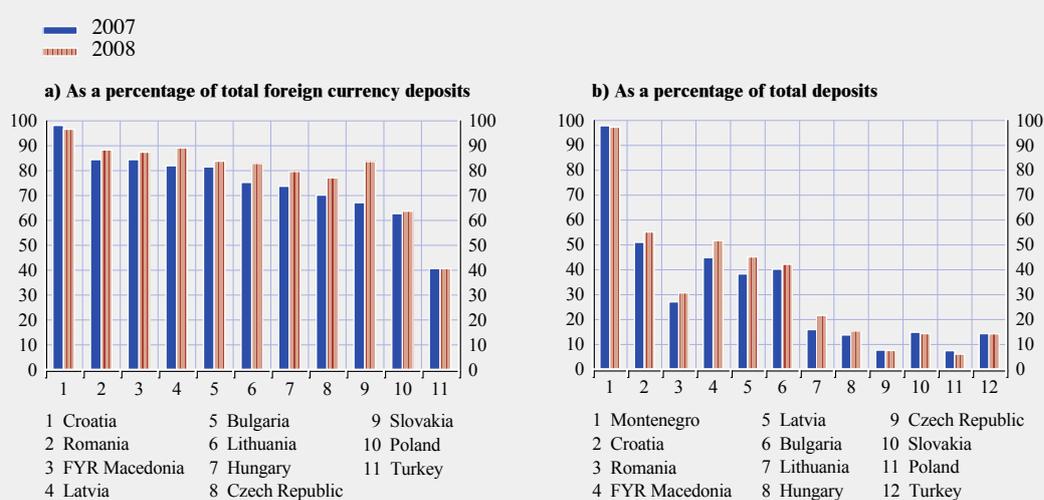
■ 2007
▦ 2008

a) As a percentage of total foreign currency deposits

1 Croatia	5 Bulgaria	9 Slovakia
2 Romania	6 Lithuania	10 Poland
3 FYR Macedonia	7 Hungary	11 Turkey
4 Latvia	8 Czech Republic	

b) As a percentage of total deposits

1 Montenegro	5 Latvia	9 Czech Republic
2 Croatia	6 Bulgaria	10 Slovakia
3 Romania	7 Lithuania	11 Poland
4 FYR Macedonia	8 Hungary	12 Turkey

Sources: National central banks and ECB staff calculations.
Notes: The definition of loans may vary across countries. Figures for Croatia may not be comparable with last year's review owing to changes in definitions and possible revisions.

Chart 28 The share of the euro in the loans of selected EU Member States and EU candidate countries
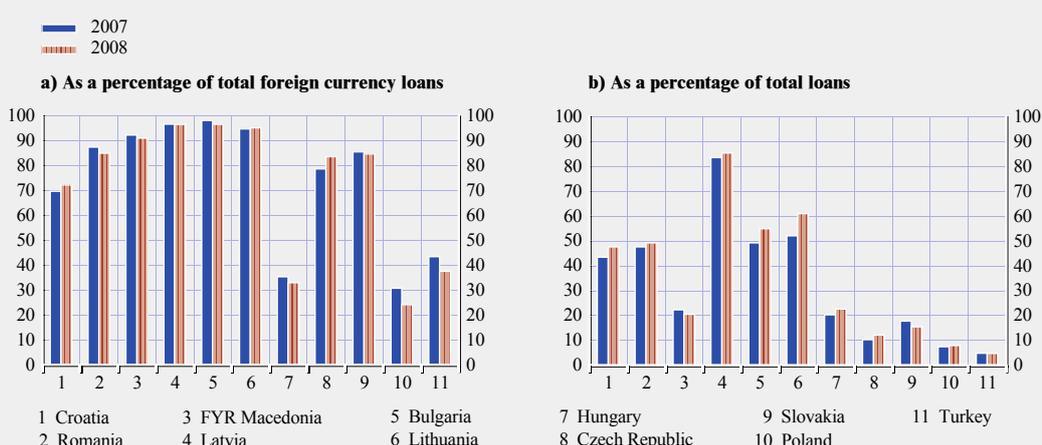
■ 2007
▬ 2008

a) As a percentage of total foreign currency loans

b) As a percentage of total loans

1 Croatia	3 FYR Macedonia	5 Bulgaria
2 Romania	4 Latvia	6 Lithuania
7 Hungary	9 Slovakia	11 Turkey
8 Czech Republic	10 Poland	

Sources: National central banks and ECB staff calculations.
Notes: The definition of loans may vary across countries. Figures for Croatia may not be comparable with last year's review owing to changes in definitions and possible revisions.

As regards euro-denominated loans in EU Member States and EU candidate countries, the euro has remained the most widely used currency of denomination for borrowing in foreign currency (see Chart 28a). As regards the share of the euro in total loans and borrowing in foreign currency in general, the global financial crisis has underscored the risks associated with unhedged borrowing by households and corporations. In particular, a depreciation of local currencies against the euro or the US dollar will lead to an increase in the borrowing costs of these economic agents. Nevertheless, borrowing in euro has remained notable and even increased during 2008 in most countries (see Chart 28b).

The prevalence of foreign currency lending may create significant macroeconomic risks. On the flow side, because of the low initial debt servicing costs associated with a large interest rate differential vis-à-vis domestic currency loans, the extension of foreign currency loans may contribute to overall credit growth, rather than merely reflecting a substitution between different loan categories. In this respect, there is a risk that foreign currency lending may lead to excessive credit growth during boom periods, thereby potentially contributing to overheating pressures. On the stock side, a high

level of outstanding loans denominated in foreign currency may pose potential risks to financial stability. Through the extension of foreign currency loans, banks convert exchange rate risk into credit risk.[39] While a change in the exchange rate no longer directly affects banks' balance sheets, it changes the value of the loan relative to the repayment capacity of unhedged borrowers. In particular, a depreciation would increase the domestic currency value of the loan and is likely to result in a deterioration in the quality of banks' loan books. An important aspect in this respect is the correlated nature of risks, as all loans denominated in (a certain) foreign currency will be affected in the event of an exchange rate shock. As a result, many debtors will become insolvent at the same time.[40] In addition to indirect risks to banks, there are also potential direct risks, if foreign currency loans are not refinanced in the same currency and with the same maturity. A maturity mismatch

39 See the Eurosystem reports by Winkler and Beck (2006) and Bracke et al. (2008) for a discussion of these risks in EU candidate countries.
40 In addition, there may be a risk stemming from correlated collateral valuations. If housing loans in foreign currency are concentrated in certain regions, the value of mortgages is likely to decline in narrow regional markets owing to extensive repossession by banks.

would give rise to potential funding risks, as banks would have to roll over existing funding over the duration of the loan. Thus, as a consequence of a high level of foreign currency-denominated loans, monetary policy may be faced with possible adverse financial stability implications of a reduction in policy rates, as this may result in downward pressure on the exchange rate. Closely related to this, a high stock of foreign currency-denominated loans may have important implications for the monetary policy transmission channel, as the positive competitiveness effect from a devaluation may be, at least partly, offset by negative balance sheet effects.
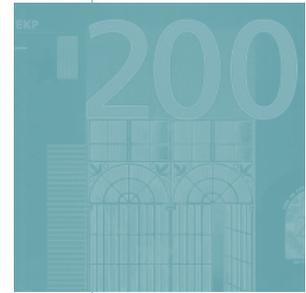
5 SPECIAL FOCUS: CURRENCY CHOICE IN THE ISSUANCE OF FOREIGN CURRENCY-DENOMINATED BONDS [41]

This special focus examines the determinants of currency choice in the issuance of foreign currency-denominated bonds – that is, bonds issued in a currency other than the currency of the country in which the borrower resides. In particular, this section investigates the role of lower borrowing costs – exploiting deviations from uncovered or covered interest parity – in the currency choice of bond issuers. The analysis suggests that issuers prefer, all other things being equal, to borrow in currencies that are associated with low nominal interest rates. Specifically, financial entities, such as investment banks, are more likely than other issuers to choose their currency of issuance in response to low nominal rates. However, expectations of an appreciation in the issuance currency seem to play no role in the currency choice. Implicit in this finding is the failure of a key pillar of international financial theory: uncovered interest parity.

5.1 INTRODUCTION

The issuance of foreign currency-denominated debt securities is an increasingly important feature of global debt markets, with the outstanding value of foreign currency-denominated debt securities more than tripling during the past decade and outpacing the growth of debt securities issued in local currencies. Issuers of foreign currency-denominated debt securities must, of course, select a currency of issuance for each security offered, and the extent to which issuers prefer one currency over another provides a useful measure of the relative importance of world currencies in international financial markets.

The choice of issuance currency is affected by a number of factors. First, an issuer may want to ensure that the currency composition of its financial obligations broadly matches the currency composition of its cash inflows.[42] By ensuring a match, an issuer with foreign currency revenues creates a natural hedge against the currency risk associated with its foreign assets. Second, an issuer's strategic considerations may

include the desire to diversify its investor base and, for high-value bond issues, the opportunity to exploit the existence of fewer credit constraints in more liquid, foreign bond markets.

A third factor affecting the choice of issuance currency is the scope for reductions in borrowing costs through the issuance of bonds in currencies offering low effective interest costs. This third factor has received little or no attention in most academic studies, which tend to concentrate on the microeconomic, firm or issuer-specific, determinants of currency choice. This special focus attempts to redress the balance and shed new light on the role of interest rates in the choice of issuance currency.

The rest of this special focus is structured as follows. Sub-section 5.2 briefly surveys the relevant literature on currency choice in bond issuance. Sub-section 5.3 presents some descriptive statistics. Sub-section 5.4 offers a non-technical overview of the modelling and empirical methodology. Results are presented in Sub-section 5.5, while Sub-section 5.6 presents concluding remarks.

5.2 CURRENCY CHOICE IN INTERNATIONAL BOND ISSUANCE: A REVIEW OF THE LITERATURE

Most academic studies on currency choice in foreign currency-denominated bond markets explain the choice of currency as being motivated mainly by a desire to provide a hedge against foreign cash inflows.[43] Allayanis and Ofek (2001), for instance, find that for a sample of US non-financial firms the issuance of foreign currency-denominated debt is correlated positively with foreign sales and trade. In the same vein, Kedia and Mozumdar (2003) and Aabo (2006) find that the probability of an issuer

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41 This section draws on research by Habib and Joy (2008).
42 See in particular the special focus on the "Determinants of the currency choice in international bond issuance by corporations" in the January 2005 issue of this review (European Central Bank (2005)).
43 See Allayannis et al. (2003), Elliot et al. (2003), and Keloharju and Niskanen (2001).

issuing debt in foreign currencies is influenced strongly by the presence of foreign operations.

Beyond this, other studies suggest that credit constraints in domestic bond markets provide an impetus for issuing bonds in foreign currencies. Kedia and Mozumdar (2003) and Siegfried et al. (2007) find that large corporations (assumed to be more likely to encounter credit constraints at home) tend to issue more in foreign currencies. Furthermore, Eichengreen and Hausmann (1999) suggest that for many emerging economies the domestic currency cannot be used to borrow abroad or to borrow long term, even domestically.[44] The latter group – issuers from emerging market economies – is, however, less important from a quantitative point of view, as the bulk of international debt securities are issued by corporations, in particular financial institutions, residing in industrial countries.[45]

All of these studies offer plausible explanations for the issuance of foreign currency-denominated bonds. What they ignore, however, is the possibility that issuance in a foreign currency is driven purely by a desire to lower costs. That is, they ignore the possibility that issuers choose to issue bonds in a foreign currency simply because the chosen currency offers, at the time of issuance, lower effective borrowing costs than any other currency.

A number of studies assess, indirectly, the question of cost reduction in the issuance of foreign currency-denominated bonds. Graham and Harvey (2001) find that 44% of the corporations in their survey cite lower borrowing costs as an important reason for issuing bonds denominated in foreign currencies. Johnson (1988) finds that Canadian financial firms issue more debt in currencies that offer lower expected service costs, while Keloharju and Niskanen (2001) find that Finnish firms tend to issue bonds when the nominal interest rate for the loan currency, relative to other currencies, is lower than usual. East Asian non-financial firms are found by Allayanis et al. (2003) to react in a similar fashion to nominal interest rate differentials.

However, Henderson et al. (2006), investigating debt issues into the United States, find only weak support for the proposition that companies issue debt overseas in order to profit from lower borrowing costs, while Cohen (2005) finds that bond issuance in a given currency tends to increase with higher, not lower, interest rates in that currency.

The idea that cost savings can be secured by issuing bonds in low interest rate currencies does, of course, violate traditional interest rate parity conditions. According to the condition of uncovered interest parity, any discount in foreign interest rates will be offset exactly by the expected appreciation of the foreign currency. If this parity condition holds true, it leaves no scope for exploitable cost savings from opportunistic issuance.

Empirically, however, the assumption of uncovered interest parity does not, in general, hold true (see, for instance, Isard (1996)). Most empirical studies find that low interest rate currencies do not systematically appreciate over time, as suggested by the assumption of uncovered interest parity. In fact, they tend to do the opposite: they depreciate.[46] This suggests that in practice there are cost savings to be secured by leaving exchange rate risk uncovered and issuing bonds in low interest rate currencies.

Indeed, a casual inspection of recent trends in the issuance of foreign currency-denominated bonds suggests evidence of a strong link between issuance and nominal interest rates. Chart 29 depicts the number of bonds issued in euro by issuers domiciled in countries other than the euro area during the period 1999 to 2008. It also shows the differential between euro area interest

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44 See also Hausmann and Panizza (2003).
45 See Section 3.1 of this report.
46 Note that over long horizons some researchers find that uncovered interest parity does hold (see for instance Meredith and Chinn (1998)). Note also, however, that the aim of this special focus section is not to provide new evidence on interest parity conditions. It is rather to assess whether issuance behaviour, at the aggregate level, is consistent with belief, or lack of belief, in these parity conditions.

Chart 29 Interest rate differential for the euro versus issuance (number) of euro-denominated foreign currency bonds

(five-year maturity; narrow measure, i.e. excluding home currency issuance)

— interest rate differential (left-hand scale)
···· issuance (number) (right-hand scale)
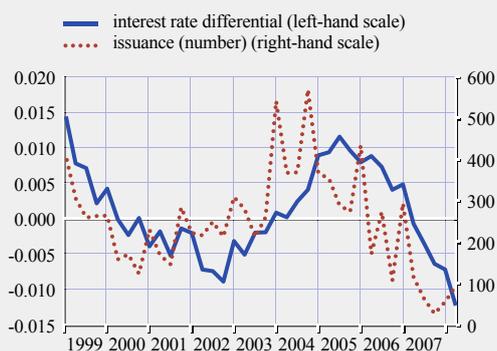
Sources: Bondware and ECB calculations.
Notes: Interest rate differential equals weighted average of other interest rates minus euro interest rate, as defined in Habib & Joy (2008). Issuance is number of bonds issued. Includes only fixed interest rate securities.

rates and an average of interest rates in non-euro area countries. The differential is defined as the average foreign interest rate minus the interest rate on the euro, such that a higher differential implies that uncovered borrowing in euro becomes cheaper. [47]

Of course, issuers may decide against leaving exchange rate risk uncovered. They may, if risk-averse, prefer to purchase cover. In this case, traditional parity conditions once again state that there is no advantage to be gained, in terms of cost reduction, from issuing in one currency as opposed to another: the hypothesis of covered interest parity states that foreign interest costs are always equal to domestic interest costs once the price of hedging against exchange rate risk is taken into account. The implication is that if the assumption of covered interest parity holds true in practice, there are no profitable arbitrage opportunities to be had from issuing in a rival currency in an attempt to lower covered borrowing costs.

Most empirical studies suggest that the condition of covered interest parity, unlike uncovered interest parity, does indeed hold true.[48] Transaction costs associated with the relevant arbitrage strategies tend to be small

and so deviations from covered interest parity tend to be negligible (see Taylor (1987)). It is important to note, however, that most of this evidence in support of covered interest parity is based on empirical studies that look at time horizons of less than one year, with cover provided by the forward market. These horizons are too short to be relevant for the vast majority of foreign currency-denominated bonds, where bond maturities can range from one year to twenty years and beyond. The forward market becomes illiquid for time horizons much greater than a year, and the potential cost of arbitrage strategies becomes correspondingly higher. Indeed, studies of long-term covered interest parity tend to reveal deviations from parity that are much larger and more persistent than those for short-term covered interest parity (Fletcher and Taylor (1996)).

For issuers of foreign currency-denominated bonds, exchange rate cover is provided not by the forward market, but by the swaps market.[49] Specifically, issuers obtain cover by purchasing a currency swap (or an appropriate combination of currency swaps). By issuing a foreign currency-denominated bond and combining it with a currency swap, an issuer can transform its fixed-rate *foreign currency* payments into fixed-rate *domestic currency* payments, remaining entirely free of exchange rate risk. The issuer creates, in essence, a synthetic domestic bond. If swap-plus-bond yields are not constant across currencies (implying a violation of swap-covered interest parity), the issuer can reduce its total borrowing costs by issuing its bonds in whichever currency is associated with the lowest swap-inclusive yields.

The challenge is to verify this empirically. McBrady and Schill (2007) offer a recent empirical appraisal of deviations from both

47 Interest rates are defined in Chart 29 as yields on government bonds with a five-year maturity. Foreign currency-denominated bonds in Chart 29 also have a maturity of five years.
48 See, for instance, Taylor (1992) and Willett et al. (2002) for surveys of the literature on covered interest parity.
49 See Popper (1993) for a description of how currency swaps are employed by issuers of foreign currency-denominated bonds to cover exchange rate risk.

uncovered and covered interest parity for issuance of foreign currency-denominated bonds, concentrating on a small sample of issuers with no foreign subsidiaries or foreign currency cash flows, i.e. with no natural hedge motive and only an opportunistic incentive for foreign currency issuance. They find that issuance of bonds responds to deviations from both uncovered and covered interest parity. This special focus offers a closer examination of the responsiveness of bond issuance to covered and uncovered cost savings, drawing on a large, unique dataset obtained from the Bondware database, employing a utility-consistent model, and adopting a novel empirical approach to tackle the question of currency choice in the issuance of foreign currency-denominated bonds, focusing in particular on the number, not the value, of bonds issued in international currencies.

5.3 ISSUANCE OF FOREIGN CURRENCY-DENOMINATED BONDS: 1999 TO 2008

The market for foreign currency-denominated debt securities has grown rapidly in size during

the lifetime of the euro, with total outstanding issuance amounting to USD 9.6 trillion at the end of 2008, compared with USD 3.0 trillion in 1999.[50] Foreign currency-denominated debt securities are issued each year in around 60 different currencies, but issuance is concentrated mostly in five of them: the US dollar, the euro, the Japanese yen, the pound sterling and the Swiss franc, which accounted for 94% of new issuance of foreign currency-denominated debt securities in 2008 (see Chart 30). Between 1999 and 2008, the outstanding amount of euro-denominated issuance as a share of all issuance increased from 21% to 32%. Meanwhile, the share of US dollar-denominated issuance dropped from 49% to 45%.

The average maturity of all foreign currency-denominated debt securities varies across currencies. The maturity of debt securities (including money market instruments) tends to be higher for those denominated in Japanese yen

50 These figures include all fixed, floating and convertible debt securities.

Chart 30 Outstanding amount of international debt securities, by currency

(narrow measure, i.e. excluding home currency issuance; as a percentage of outstanding amounts; USD billions)

- other
- swiss franc
- yen
- pound sterling
- euro
- US dollar

market size (USD billions)
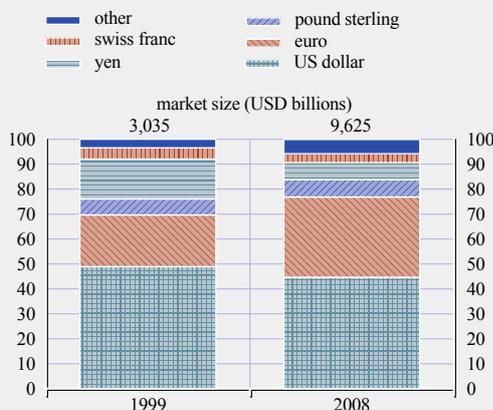
Sources: BIS and ECB calculations.
Notes: Principal amount is in USD billions at current exchange rates. Figures include only foreign currency-denominated debt securities (types: fixed interestrate debt securities, floating rate debt securities and convertibles). All maturities.

Chart 31 Average maturity of international debt securities, by currency (1999-2008)

(mean maturity, in years, of all international debt securities; narrow measure, i.e. excluding home-currency issuance)
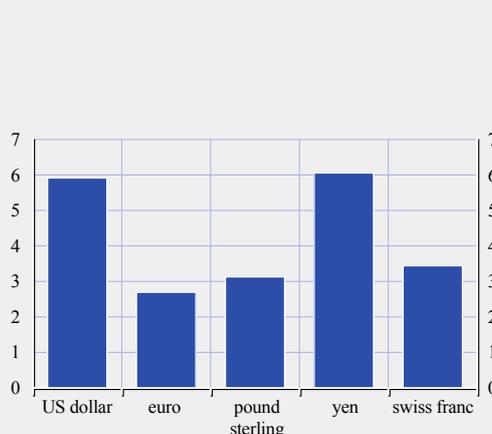
Sources: Bondware and ECB calculations.
Note: Data cover the period up to June 2008.

(6.1 years) and US dollars (5.9 years) than for other currencies (see Chart 31). Securities denominated in euro, including money market instruments, carry an average maturity of 2.7 years.

The previous charts present data covering the entire issuance of international debt securities. However, in this special focus section, the sample is restricted to bonds (i.e. securities with a maturity of more than one year) with fixed interest rates issued in the five main issuance currencies. This restriction to bonds, excluding therefore money market instruments, is applied because cover for debt securities with a maturity of one year or less can be obtained at a low cost in the forward market, making currency choice relatively unimportant for the issuer. Moreover, for practical reasons, in order to empirically test the model, other types of security, such as convertible bonds and floating rate notes, are excluded. These limitations are not excessive, since bonds account for 64% of the gross value of all foreign currency-denominated securities issued between 1999 and 2008, while fixed interest rate securities account for around three-quarters of the total value of all foreign currency-denominated securities issued in the same period (see Chart 32).
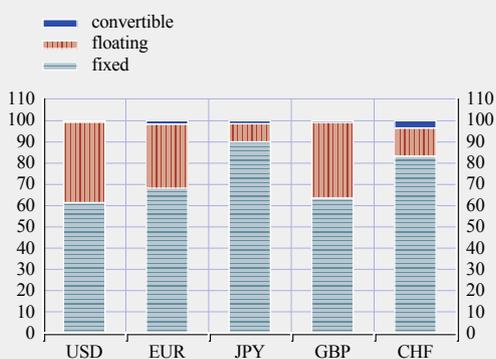
Another distinctive feature of the sample used in this section is that issuance is measured in terms of the number of bonds issued rather than the value of bonds issued. This is done to magnify the time-varying aspects of currency choice in bond issuance. Indeed, the number of issues is likely to be more responsive to changes in the key variables of interest: deviations from uncovered interest parity and covered interest parity. This is because the issuer's decision about the value of any bond offering tends to be determined before the actual date of the offering, sometimes up to a year before.[51] Irrespective of the value of the bond issue, a broker will advise the issuer on the most advantageous time to execute the bond offering, taking into account international financial conditions. The issuance of a foreign currency-denominated bond can therefore be thought of as a two-stage process. In the first stage, the issuer decides on the amount to raise in terms of value. In the second stage, a decision is taken with regard to the currency of issuance, influenced, for some but not all issuers, by the scope for covered or uncovered borrowing cost savings. At the aggregate level, therefore, the main detectable response to deviations from covered and uncovered interest parity, in any given period, will not necessarily be a change in the total *value* of bonds issued in a certain currency, it will be a change in the total *number* of bonds issued.[52]

The time variation of issuance can be very different across currencies. Indeed, quarterly time series on the number of foreign currency bonds issued (at all maturities) in US dollars, yen and euro show considerable volatility between 1999 and 2008 (see Chart 33). Even broad trends can be dissimilar. In 2001, for instance,

Chart 32 Gross issuance (value) of international debt securities, by type

(narrow measure, i.e. excluding home currency issuance; as a percentage of gross issuance in US dollars at current exchange rates; 1999-2008)

- convertible
- floating
- fixed

Sources: Bondware and ECB calculations.
Notes: Fixed = all fixed rate issues; floating = all floating rate notes; convertible = all convertible issues. All maturities. Data cover the period up to June 2008.

51 This decision is affected mostly by issuer-specific factors – such as retained earnings, project finance, target debt ratios and share price valuation – and market-specific, time-invariant factors – such as a large investor base and liquid financial markets in a given currency. See, for instance, Myers (2001).

52 The descriptions presented here of the mechanics of standard bond issuance procedures are informed by the relevant literature and by consultations with market participants, including brokers, underwriters and representatives of a number of major bond issuers.

Chart 33 Gross issuance (number) of international bonds and notes, by major currency

(narrow measure, i.e. excluding home currency issuance; 1999-2008)
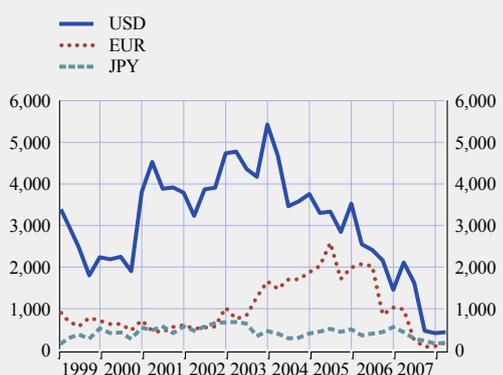
Sources: Bondware and ECB calculations.
Notes: Includes only fixed interest rate securities with a maturity of more than one year (excludes money market instruments). Data cover the period up to June 2008.

the number of foreign currency-denominated bonds and notes issued in US dollars rose sharply, more than doubling in number, whereas the number of euro-denominated bonds and notes hardly rose at all.[53]

5.4 MODELLING CURRENCY CHOICE: EMPIRICAL METHODOLOGY

This sub-section presents a non-technical overview of a model that attempts to explain currency choice in the issuance of foreign currency-denominated bonds, testing, in particular, the explanatory power of deviations from covered and uncovered interest parity during the period from 1999 to 2008. These deviations represent opportunities for covered and uncovered borrowing cost savings.

Empirically, the question of currency choice in the issuance of foreign currency-denominated bonds is addressed through a panel count data model, whereby the dependent variable is the number of bonds issued in US dollars, euro, yen, Swiss francs and pounds sterling, on a quarterly basis.[54] Explanatory variables include proxies for both covered and uncovered borrowing cost savings, the natural hedge against foreign cash inflows, transaction costs

and time-invariant factors such as tax advantages.

Data on international bond offerings are obtained from the Bondware database maintained by Dealogic. The dataset includes all issuing entities, both public and corporate, from a total of 116 countries during the period from January 1999 to June 2008, and incorporates a sample of foreign currency-denominated bonds that has an aggregate gross value of USD 29 trillion at current exchange rates. The sample of bonds is sorted by maturity and split into three maturity brackets, which makes it possible to match, as closely as possible, bonds of a given maturity with interest rates and swaps of the same maturity – a key requirement for an accurate estimation of the model. Before proceeding, it is necessary to provide an operational definition of the two key explanatory variables in the model: uncovered cost savings and swap-covered cost savings.

UNCOVERED COST SAVINGS

Uncovered borrowing cost savings in the issuance of foreign currency-denominated bonds arise whenever the expected appreciation of a low interest rate foreign currency is not so large as to offset the savings to be made by borrowing at the low, foreign interest rate.[55] If uncovered

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53 When measured in terms of value, issuance trends are not dissimilar to those measured in terms of number of bonds issued. The correlation between issuance in terms of value and number of euro-denominated bonds with a maturity of two years is 0.88. For euro-denominated bonds with a maturity of five years, it is 0.92, while for euro-denominated bonds with a maturity of ten years, it is 0.84.

54 There are a number of different techniques that could also be used. One option is to employ a panel conditional logit model where the dependent variable is a dummy variable that takes the value of one if a bond issued in a selected currency and zero otherwise (see, for instance, Siegfried et al. (2007)). This approach is best suited to an analysis of the factors influencing currency choice at the level of the firm, but it suffers from econometric weaknesses (such as the assumption of independence of irrelevant alternatives) and is not the most appropriate method for an analysis of aggregate behaviour over time. Aggregate issuance behaviour can be captured neatly by employing a dependent variable defined as bond issuance in a given currency (in a given time period) as a share of total issuance in all currencies (see McBrady and Schill (2007)). This approach is employed here as a robustness check.

55 Uncovered borrowing cost savings also exist whenever a depreciation of a high interest rate foreign currency is so large as to offset completely the extra costs incurred from borrowing (issuing bonds) at the high, foreign interest rate.

borrowing cost savings do exist, the implication is that an issuer of bonds, by leaving its exchange rate risk uncovered and issuing bonds in the low interest rate currency, can systematically lower its expected borrowing costs. The larger the deviation from uncovered interest parity, the larger will be the expected cost savings.

In practice, it is perhaps easiest to think of deviations from uncovered interest parity as being made up of two components: an interest rate differential (home minus foreign interest rates) minus a measure of expected foreign currency appreciation. A proxy for expected exchange rate appreciation is constructed, for each issuance currency, using survey data of consensus forecasts for exchange rates. The fully constructed variable, deviations from uncovered interest parity, is measured in basis points. The larger the value of this variable, the greater the incentive to issue bonds in the foreign currency.[56] For issuance denominated in euro during the period from 1999 to 2008, cost savings associated with the nominal interest rate differential (non-euro area minus euro area) average 17 basis points for bonds with a maturity of two years, 8 basis points for bonds with a maturity of five years and 9 basis points for bonds with a maturity of ten years.

SWAP-COVERED COST SAVINGS
Covered borrowing cost savings are possible whenever interest rates across countries differ even after the cost of covering for exchange rate risk is taken into account. These savings represent an arbitrage opportunity, allowing the issuer to achieve cost savings completely free of exchange rate risk.[57] The larger the deviation from covered interest parity, the larger will be the risk-free cost savings. For issuers of foreign currency-denominated bonds, the cost of covering for exchange rate risk is determined not by the forward market, but by the swaps market. Cost savings are, therefore, swap-covered cost savings.

Deviations from swap-covered interest parity can, once again, be thought of as comprising two components: an interest rate differential (home

minus foreign interest rates) minus the cost to the issuer of the swap contract required to transform its fixed, foreign currency bond payments into fixed, domestic currency bond payments. Deviations from swap-covered interest parity are measured in basis points. The larger the value of this variable, the greater the risk-free incentive to issue bonds in the foreign currency.[58] For issuance denominated in euro during the period from 1999 to 2008, covered borrowing cost savings are negative, on average, for bonds of all maturities, averaging -20 basis points for bonds with a maturity of two years, -27 basis points for bonds with a maturity of five years and -28 basis points for bonds with a maturity of ten years.

MULTI-CURRENCY FRAMEWORK
So far, the concepts of covered cost savings and uncovered cost savings have been discussed here in terms of a binary choice between issuing in the home currency or issuing in a foreign currency. The challenge is to consider the choice not of just one foreign currency, but of multiple foreign currencies. In practice, in the multi-currency framework that follows, the foreign currency is replaced by the issuance currency (which alternates, according to the data, between the US dollar, the euro, the yen, the pound sterling and the Swiss franc), and the home currency is replaced by a weighted average of all currencies other than the issuance currency. For instance, for bonds issued in euro by non-euro area residents, the multi-currency equivalent of the foreign interest rate is the euro area interest rate, while

56 Technically, $\varepsilon_t^u \equiv (r_{t,t+k} - r_{t,t+k}^*) - (s_{t,t+k}^e - s_t)$, where ε_t^u represents uncovered borrowing cost savings in time t; where $r_{t,t+k}$ is the time t home interest rate (compounded continuously) that holds over time interval $t+k$; where $r_{t,t+k}^*$ is the time t foreign interest rate (also compounded continuously) defined over the $t+k$ interval; where s_t is the log of the spot exchange rate (defined in terms of home currency per foreign currency) and where $(s_{t,t+k}^e - s_t)$ is the expected rate of foreign currency appreciation (compounded continuously) during the time interval $t+k$.

57 Swap contracts are often not fully collateralised, therefore the cost of covering for exchange rate risk through currency-swaps should include not only transaction costs but also a risk premium for counterparty risk.

58 That is, $\varepsilon_t^c \equiv (r_{t,t+k} - c_{t,t+k}^{sw}) - (r_{t,t+k}^* - c_{t,t+k}^{sw*})$, where ε_t^c is covered borrowing cost savings; where $c_{t,t+k}^{sw}$ is the yield on the domestic currency swap of the relevant maturity k; and where $c_{t,t+k}^{sw*}$ is the yield on the foreign currency swap also of maturity k (with all yields compounded continuously).

the home interest rate is a weighted average of all interest rates associated with the countries that are home to non-euro area-resident issuers of euro-denominated bonds.[59]

CONTROL VARIABLES

Of course, the scope for cost savings through the exploitation of interest rate differentials, whether covered or uncovered, is not the only factor that affects currency choice in the issuance of foreign currency-denominated bonds. As mentioned above, corporations often issue bonds in foreign currencies so that the payments on these bonds can act as an offsetting liability against foreign cash inflows (the natural hedge motive). Other factors are transaction costs (issuers may choose to issue in a currency that offers a more liquid market), tax advantages and the strategic incentive to issue in a currency that offers a wider investor base. All of these additional factors are incorporated either explicitly or implicitly into the model of currency choice in bond issuance.

As a proxy for the "natural hedge", three variables are included to reflect the magnitude of cash flow-generating assets in the issuance currency region:[60] (i) GDP in the issuance currency country as a share of GDP in all other issuance currency countries; (ii) number of cross-border mergers and acquisitions into the issuance currency country as a proportion of total cross-border mergers and acquisitions into all issuance currency countries; (iii) direct investment in the issuance currency country relative to direct investment in all issuance currency countries. Liquidity effects are accommodated explicitly by including a variable representing financial depth, calculated as the total capitalisation of the issuance currency debt market (both domestic issuance and international issuance) divided by GDP. Time-invariant factors affecting the choice of currency of issuance, such as tax advantages, are accommodated in the panel regressions with fixed effects.

5.5 FINDINGS

The model of currency choice in the issuance of foreign currency-denominated bonds is tested empirically using panel count data estimation.[61] The results confirm that uncovered borrowing cost savings do act as a significant determinant of the quarterly number of bonds issued in the five main issuance currencies, whereas covered borrowing cost savings do not seem to influence the issuance decision. Table 8 summarises the main results for the three sub-samples defined according to maturity: two years, five years and ten years.

- *Uncovered cost savings*: issuers appear to be responsive to uncovered cost savings when issuing bonds of any maturity. For bonds with approximate maturities of either two years, five years or ten years, the estimated coefficient on uncovered cost savings carries the expected sign, namely positive, and its magnitude is similar (around 0.3), implying that a 20 basis point increase in uncovered borrowing cost savings is associated with a 7% increase in the number of bonds issued in the issuance currency.[62]

- *Swap-covered cost savings*: the availability of covered cost savings appears to play a negligible role in the issuance decision. Although market participants and empirical studies report that differences between currencies in swap-covered issuance costs do exist, in particular over longer horizons, it seems that these differences do not exert an economically significant influence on bond issuance.[63]

- *Control variables*: the relative financial depth of the bond market associated with each issuance currency, the relative share of direct investment into each issuance currency region and the relative share of cross-border mergers and acquisitions

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59 For further details, see Habib and Joy (2008).
60 The choice of these variables draws on the findings of other studies that account for the natural hedge, such as Cohen (2005) and Siegfriend et al. (2007).
61 A negative binomial model is used for estimation.
62 Note that the percentage change in the expected number of bonds issued for a unit change in each explanatory variable, holding other variables constant, is calculated as 100*[exp(*estimated coefficient*)-1].
63 See Fletcher and Taylor (1996) and the discussion in Sub-section 5.2.

into each issuance currency region are found, for bonds of all maturities, to be statistically insignificant in general as drivers of currency choice among issuance currencies. However, the results also show that economic activity within the issuance currency region (denoted in the table as relative GDP) acts as a significant driver of issuance for all bonds in the sample except

for those with the longest maturities. For all bonds other than those that fall into the ten-year maturity bracket, the estimated coefficients imply that a 1 percentage point increase in the share of economic activity in the issuance currency region is associated with an increase of roughly 4% in the number of bonds offered in the issuance currency. The implication is

Table 8 Count model of foreign currency choice in the issuance of foreign currency-denominated bonds

	(1)	(2)	(3)	(4)
Panel A. Issuance of foreign-currency-denominated bonds, two-year maturity				
Uncovered cost savings		0.332**)	0.404**)	
		(0.110)	(0.110)	
Covered cost savings	0.063		0.042	
	(0.120)		(0.120)	
Interest-rate differentials				0.335**)
				(0.110)
Expected foreign-currency appreciation				-3.036**)
				(1.070)
Relative GDP	0.024	0.032**)	0.039**)	0.032**)
	(0.010)	(0.010)	(0.010)	(0.010)
Relative financial depth	0.008	0.006	0.005	0.004
	(0.010)	(0.010)	(0.010)	(0.010)
Panel B. Issuance of foreign-currency-denominated bonds, five-year maturity				
Uncovered cost savings		0.212**)	0.219**)	
		(0.080)	(0.080)	
Covered cost savings	-0.073		0.022	
	(0.010)		(0.110)	
Interest-rate differentials				0.218**)
				(0.080)
Expected foreign-currency appreciation				0.519
				(0.750)
Relative GDP	0.030**)	0.020*)	0.019	0.021**)
	(0.010)	(0.010)	(0.010)	(0.010)
Relative financial depth	0.003	0.001	0.001	0.002
	(0.000)	(0.000)	(0.000)	(0.000)
Panel C. Issuance of foreign-currency-denominated bonds, ten-year maturity				
Uncovered cost savings		0.299**)	0.296**)	
		(0.080)	(0.080)	
Covered cost savings	-0.129		-0.012	
	(0.090)		(0.090)	
Interest-rate differentials				0.308**)
				(0.080)
Expected foreign-currency appreciation				1.054
				(0.750)
Relative GDP	0.014	0.004	0.004	0.003
	(0.010)	(0.010)	(0.010)	(0.010)
Relative financial depth	0.004	0.001	0.001	0.003
	(0.000)	(0.000)	(0.000)	(0.000)

Notes: This table reports the summary results from a fixed-effects negative binomial panel model of currency choice allowing for over-dispersion. The dependent variable is the number of foreign currency-denominated bonds issued in currency i at time t. Parameter estimates for control variables relative real GDP and relative financial depth are reported. Parameter estimates for control variables relative share of direct investment and relative share of cross-border mergers and acquisitions are suppressed for reasons of space. Regressions include fixed effects and year dummies. All explanatory variables are measured at the beginning of the quarter. The sample period is from January 1999 to June 2008. Standard errors are in parentheses. *) and **) denote significance at the 5% and 1% levels respectively.

that in as much as relative GDP captures the incentive to issue foreign currency-denominated bonds in order for these bonds to act as a natural hedge against foreign cash inflows arising from real assets, this has an important role to play in determining currency choice among issuance currencies.

These results are robust to a number of alternative specifications of the model, as presented in columns 1 to 4 of Table 8. In particular, it is interesting to examine, in column 4, a decomposition of the uncovered cost savings variable into its two component parts: the interest rate differential and the expected appreciation of the issuance currency. Statistical tests show that what drives the overall economic significance of uncovered cost savings is the interest rate differential and not the expected appreciation (or depreciation) of the issuance currency. This is also confirmed by looking at the time series. Chart 34 compares interest rate differentials for bonds with a two-year maturity against issuances denominated in euro (panel a), US dollars (panel b) and yen (panel c) respectively. The relationship with interest rate differentials seems to be strongest for euro-denominated bond issuance and less strong for US dollar-denominated and yen-denominated issuance.

If the dependent variable is re-expressed as the number of foreign currency-denominated bonds issued in a given currency as a share of all foreign currency-denominated bonds issued, the main results are unaffected.[64] Furthermore, when estimation is undertaken measuring issuance in terms of the value of bonds offered, rather than the number of bonds offered, the results are consistent with the assumption, discussed above, that it is the number of bonds issued that is more responsive to changes in uncovered borrowing cost savings. The results suggest that covered and uncovered cost savings explain much less of the variation in the value of foreign currency-denominated bonds issued – around 20% less than in the case of the number of bonds issued (see Habib and Joy (2008) for more details).

Chart 34 Interest rate differentials versus issuance (number) of foreign currency-denominated bonds

(two-year maturity; narrow measure, i.e. excluding home country issuance)

——— interest rate differential (left-hand scale)
········· issuance (number) (right-hand scale)
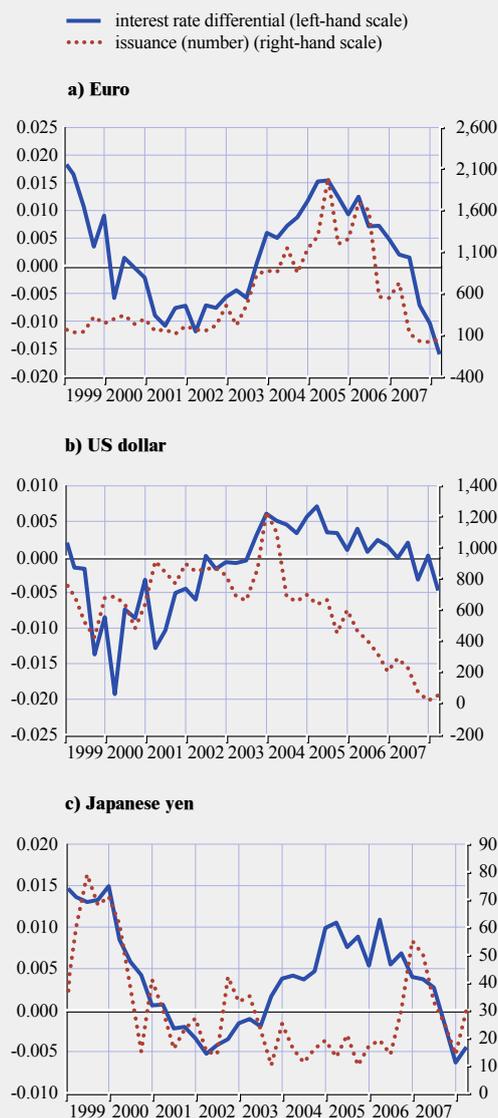
Sources: Bondware and ECB calculations.
Notes: The interest rate differential equals the weighted average of other interest rates minus the interest rate in the respective currency, as defined in Habib and Joy (2008). Issuance is the number of bonds issued. Includes only fixed interest rate securities.

64 For this approach, where the dependent variable is a proportion, bounded below by zero and above by one, Prais-Winsten panel estimation is employed, allowing for contemporaneous correlation across error terms, heteroscedasticity and autocorrelated residuals. Further details are provided by Habib and Joy (2008).

It may be considered whether these results are similar for all types of issuer. For instance, financial entities (such as investment banks, commercial banks and credit institutions) could be more sensitive than other issuers to "speculative" incentives such as uncovered borrowing cost savings, whereas non-financial entities may prefer to refrain from taking unhedged currency positions. To investigate this hypothesis, the sample of issuers is split into financial and non-financial issuers. It is important to note that financial entities dominate issuance in all major currencies, in particular the issuance of bonds with maturities of five years or less. Financial issuers, for instance, account for 95% of all bonds issued in euro with an average maturity of two years. Estimation results – not reported here – suggest that financial issuers respond more strongly than non-financial issuers to uncovered cost savings.[65] As bond maturities lengthen, financial issuers become more responsive to uncovered cost savings and nominal interest rate differentials. Covered cost savings are, in general, important for neither financial issuers nor non-financial issuers.

5.6 CONCLUSIONS

So far in the academic literature, the use of the major international currencies in bond issuance has been explained mainly by strategic considerations of issuers and by an aggregate tendency to issue bonds to provide a hedge against foreign cash inflows. This special focus section shows that a statistically significant proportion of the quarterly variation in the number of bonds issued in the five leading issuance currencies can be explained as a response to the possibility of uncovered borrowing cost savings.

Uncovered borrowing cost savings, defined as deviations from uncovered interest parity, exert a significant influence on currency choice. In particular, issuers prefer to borrow in currencies that offer relatively low nominal interest rates. Expected changes in foreign

exchange rates, however, do not seem to exert any significant influence on currency choice. The influence of uncovered cost savings is strongest for financial issuers.

Finally, there is no clear evidence that covered cost savings systematically affect the number of bonds issued in a given issuance currency. Although arbitrage opportunities do seem to be present in the swap markets, such opportunities do not seem to be taken up by bond issuers in sufficient numbers to result in a measurable economic response.

Overall, these findings offer a useful contribution to the understanding of currency choice in the issuance of foreign currency-denominated bonds and suggest that the scope for uncovered borrowing cost savings through differentials in interest rates exerts a significant influence on the choice of issuance currency.

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65 See Habib and Joy (2008) for these results.

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STATISTICAL ANNEX

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ANNEX

Table 1 Currency breakdown of portfolio investment assets held in debt securities at the end of 2007

(excluding euro area countires; ranked by region and size of total assets)

	USD millions					Percentage of total debt securities				
	US dollar	Euro	Yen	Other	Total	US dollar	Euro	Yen	Other	Total
Non-euro area EU										
Sweden	45,421	75,960	1,048	50,292	172,722	26	44	1	29	100
Denmark	40,659	74,894	1,855	37,619	155,027	26	48	1	24	100
Cyprus	13,375	15,898	500	5,633	35,406	38	45	1	16	100
Poland	2,112	2,506	....	5,221	9,847	21	25	-	53	100
Hungary	594	518	0	758	1,870	32	28	0	41	100
Bulgaria	206	675	0	247	1,128	18	60	-	22	100
Romania	12	73	0	-	218	5	33	-	-	-
Other European Countries										
Switzerland	99,429	200,061	8,280	238,970	546,740	18	37	2	44	100
Israel	18,117	4,920	86	-	27,044	67	18	0	-	-
Russia	16,178	1,237	0	5,511	22,926	71	5	0	24	100
Ukraine	10	4	....	-	14	72	28	-	-	-
America										
United States	1,498,671	189,799	55,805	199,521	1,943,796	77	10	3	10	100
Venezuela	4,205	252	....	-	5,965	70	4	-	-	-
Colombia	7,996	133	0	775	8,904	90	1	-	9	-
Mexico	9,194	31	0	-	9,244	99	0	-	-	-
Uruguay	2,090	48	0	41	2,179	96	2	0	2	100
Costa Rica	1,392	41	....	-	1,433	97	3	-	-	-
Asia										
Japan	779,601	398,782	543,171	228,544	1,950,097	40	20	28	12	100
Korea, Republic of	44,930	3,649	244	4,571	52,541	86	7	0	9	102
Thailand	9,576	638	24	1,217	11,455	84	6	0	11	100
Malaysia	2,630	163	11	710	3,513	75	5	0	20	100
Indonesia	1,609	7	1	-	1,618	99	0	-	-	-
India	6	....	....	-	51	11	-	-	-	-

Sources: IMF's Coordinated Portfolio Investment Survey CPIS and ECB calculations.

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(narrow measure; in USD billions and as a percentage of the total amount outstanding; at constant exchange rates)

	Total amount outstanding		of which denominated in:							
	All currencies (USD billions)		US dollar		Euro		Japanese yen		Other currencies	
			(%)	(% point change) vis-à-vis	(%)	(% point change) vis-à-vis	(%)	(% point change) vis-à-vis	(%)	(% point change) vis-à-vis
	2008 Q4	2007 Q4	2008 Q4	2007 Q4	2008 Q4	2007 Q4	2008 Q4	2007 Q4	2008 Q4	2007 Q4
Africa	29	32	51.1	3.2	42.5	-3.8	5.6	0.5	0.8	0.0
Asia and Pcific	657	645	61.1	-0.2	22.8	-0.3	6.1	1.3	10.0	-0.7
of which:										
Japan	60	63	54.3	1.3	36.1	-1.9	0.0	0.0	9.6	0.6
Europe	4,546	4,305	40.4	-0.4	34.8	2.1	6.5	0.0	18.2	-1.7
of which:										
Euro area	1,789	1,752	53.5	1.7	-0.3	0.0	9.8	-0.1	36.7	-1.5
Denmark, Sweden, United Kingdom	2,344	2,169	32.1	-1.1	58.8	1.9	3.9	0.2	5.2	-1.0
New Member States	120	109	8.6	-1.9	78.7	2.1	6.1	-0.4	6.5	0.1
EU27	4,253	4,031	40.4	-0.2	34.5	1.9	6.4	-0.1	18.6	-1.6
Non-EU developed Europe [1]	214	199	24.9	-2.5	48.9	4.7	10.2	1.5	16.0	-3.7
Non-EU developed Europe	86	83	76.2	-1.0	19.8	0.4	0.6	-0.3	3.4	0.9
International organisations	638	612	33.5	3.3	28.2	-0.6	7.2	0.0	31.1	-2.7
Latin America	283	301	82.6	1.7	15.2	-1.0	0.9	-0.8	1.3	0.1
Middle East	119	118	82.5	1.0	13.8	-1.0	0.3	-0.1	3.4	0.1
North America	1,260	1,220	15.7	0.7	53.7	0.1	9.5	0.1	21.1	-0.9
of which:										
Canada	298	270	66.5	-1.6	20.9	3.5	4.0	-0.2	8.7	-1.7
United State	962	950	…	…	63.8	0.0	11.2	0.3	25.0	-0.3
Offshore centres	1,444	1,441	69.4	1.7	16.1	-2.0	8.2	0.2	6.3	0.1
Total	**8,976**	**8,675**	**44.6**	**0.2**	**32.2**	**0.7**	**7.0**	**0.1**	**16.2**	**-1.1**

Sources: BIS and ECB calculations.
Note: Q4 2007 figures are expressed at Q4 2008 exchange rates.
1) Iceland, Norway, Switzerland and European microstates.

Table 3 Outstanding international debt securities, by currency

	Global measure				Narrow measure			
	EUR	**USD**	**JPY**	**Other**	**EUR**	**USD**	**JPY**	**Other**
Outstanding amounts in USD billions, at current exchange rates, end of period								
1999	7,389	16,024	6,536	4,931	629	1,484	485	436
2000	7,537	16,985	6,209	4,936	728	1,700	472	490
2001	7,819	18,445	5,936	5,094	825	1,793	426	517
2002	10,109	19,799	6,829	5,929	1,109	1,895	412	649
2003	13,522	21,403	8,323	7,298	1,561	2,129	441	829
2004	16,125	23,281	9,402	8,869	1,971	2,385	457	1,032
2005	15,361	25,327	8,854	9,750	1,925	2,706	403	1,130
2006	19,131	28,185	8,908	11,929	2,453	3,459	414	1,509
2007 Q1	20,134	29,178	8,987	12,362	2,625	3,700	434	1,623
Q2	21,223	29,827	8,674	13,123	2,803	4,005	442	1,767
Q3	22,495	30,582	9,278	13,928	2,960	4,154	486	1,822
Q4	23,742	31,225	9,467	14,489	3,111	4,189	511	1,859
2008 Q1	25,951	31,745	10,853	15,020	3,418	4,227	594	1,955
Q2	26,776	32,142	10,161	15,668	3,542	4,320	580	2,023
Q3	24,538	32,749	10,316	14,710	3,226	4,344	594	1,829
Q4	24,601	33,225	11,861	n.a.	3,098	4,299	656	1,572
Percentages of outstanding amounts, at constant exchange rates, end of period								
1999	26.5	41.5	19.1	12.9	25.7	43.8	16.1	14.3
2000	27.4	41.2	19.1	12.3	27.6	43.1	15.2	14.1
2001	27.7	41.3	19.2	11.8	30.3	41.7	14.3	13.8
2002	27.9	41.2	18.6	12.3	32.2	41.4	11.8	14.6
2003	28.0	40.2	18.5	13.3	33.4	41.3	10.1	15.2
2004	28.0	39.6	18.1	14.3	34.5	40.9	8.9	15.8
2005	28.1	39.3	17.8	14.8	34.4	41.0	7.9	16.6
2006	28.3	39.5	16.4	15.8	32.6	43.5	6.9	17.0
2007 Q1	28.6	39.6	15.9	15.9	32.4	43.7	6.7	17.2
Q2	28.8	39.3	15.6	16.3	31.9	44.2	6.6	17.3
Q3	28.5	39.4	15.2	16.9	31.3	44.8	6.7	17.2
Q4	28.4	39.5	14.8	17.3	31.3	44.6	6.7	17.4
2008 Q1	28.3	39.4	14.8	17.5	31.4	44.1	6.8	17.6
Q2	28.7	39.0	14.4	17.9	31.7	43.7	6.8	17.8
Q3	28.9	39.6	14.5	17.0	31.9	44.1	7.0	17.1
Q4	29.5	39.8	14.2	16.6	32.2	44.7	6.8	16.3
Percentages of outstanding amounts, at current exchange rates, end of period								
1999	21.2	45.9	18.7	14.1	20.7	48.9	16.0	14.4
2000	21.1	47.6	17.4	13.8	21.5	50.1	13.9	14.4
2001	21.0	49.5	15.9	13.7	23.2	50.4	12.0	14.5
2002	23.7	46.4	16.0	13.9	27.3	46.6	10.1	16.0
2003	26.8	42.3	16.5	14.4	31.5	42.9	8.9	16.7
2004	28.0	40.4	16.3	15.4	33.7	40.8	7.8	17.7
2005	25.9	42.7	14.9	16.4	31.2	43.9	6.5	18.3
2006	28.1	41.4	13.1	17.5	31.3	44.1	5.3	19.3
2007 Q1	28.5	41.3	12.7	17.5	31.3	44.1	5.2	19.4
Q2	29.1	40.9	11.9	18.0	31.1	44.4	4.9	19.6
Q3	29.5	40.1	12.2	18.3	31.4	44.1	5.2	19.3
Q4	30.1	39.6	12.0	18.4	32.2	43.3	5.3	19.2
2008 Q1	31.1	38.0	13.0	18.0	33.5	41.5	5.8	19.2
Q2	31.6	37.9	12.0	18.5	33.8	41.3	5.5	19.3
Q3	29.8	39.8	12.5	17.9	32.3	43.5	5.9	18.3
Q4	29.5	39.8	14.2	16.6	32.2	44.7	6.8	16.3

Sources: BIS and ECB calculations.

Table 4 The euro's share as a settlement/invoicing currency in extra-euro area exports and imports of goods and services of selected euro area countries

(as a percentage of the total)

	Goods							Services						
	2001	2002	2003	2004	2005	2006	2007	2001	2002	2003	2004	2005	2006	2007
Exports														
Belgium	46.7	53.6	56.6	57.7	54.8	58.5	49.0	...	64.1	70.6	72.2	73.0	73.7	76.1
Germany	...	50.1	63.0	63.2	61.0	67.8	65.2	...	...	...	...	...	...	...
Greece	23.5	39.3	47.3	44.3	39.1	38.8	39.2	11.3	13.3	16.3	14.1	15.6	14.6	14.9
Spain	52.0	57.5	61.7	62.4	62.1	61.6	65.2	53.3	59.5	64.1	64.3	67.5	67.2	71.8
France [1]	50.8	50.5	49.0	49.2	49.8	50.8	51.3	40.0	40.3	42.4	42.4	43.6	47.2	47.8
Italy	52.7	54.1	58.2	59.0	58.3	59.6	64.5	39.7	43.1	47.0	48.9	56.5	54.0	59.3
Luxembourg	46.7	44.0	51.5	61.8	61.4	57.7	59.2	...	40.4	41.6	41.9	42.4	47.7	48.4
Portugal	40.3	44.1	50.4	55.6	56.8	55.8	61.4	41.2	47.2	53.4	56.1	58.1	55.7	61.3
Slovenia	...	...	...	...	...	74.2	79.0	...	...	...	...	...	80.1	80.8
Imports														
Belgium	47.2	53.7	57.8	55.7	51.2	58.3	47.3	...	60.1	65.8	68.3	71.2	73.8	77.2
Germany	...	48.4	55.2	53.9	55.2	59.4	56.9	...	...	...	...	...	...	...
Greece	29.3	35.8	39.6	40.6	34.1	33.6	34.9	15.3	16.8	20.1	22.7	24.0	26.2	29.5
Spain	49.7	55.9	61.1	61.3	56.0	54.8	56.7	45.2	48.8	54.3	57.0	60.2	60.3	60.7
France [1]	42.6	40.8	44.1	45.7	46.3	44.3	44.2	43.3	44.0	46.6	49.2	50.3	53.3	52.2
Italy	40.8	44.2	44.5	41.2	39.4	43.3	44.6	45.2	53.2	54.4	52.3	55.5	56.1	59.2
Luxembourg	47.2	31.9	41.9	50.0	43.8	38.8	37.9	...	27.7	34.3	30.2	31.2	29.8	34.0
Portugal	50.3	54.7	57.9	57.9	54.3	52.4	51.3	63.1	65.5	69.4	71.3	73.2	73.4	71.8
Slovenia	...	...	...	...	...	64.0	73.1	...	...	...	...	...	53.1	57.2

Sources: National central banks and ECB calculations.
Notes: Data for 2001 include trade settled in euro and in legacy currencies. Data refer to the use of the euro as a settlement currency, except in the case of Germany, where they refer to invoicing. For Germany, data on trade in goods reflect the average value of data collected in surveys carried out in the first and third quarters of 2002 through to 2007 on behalf of the Deutsche Bundesbank. Data on services exclude travel, except in the case of Belgium. 2007 data for trade in goods of Belgium are not comparable to previous years.
1) Data for goods are based on estimates from 2005 onwards.

Table 5 The euro's share as a settlement/invoicing currency in extra-EU exports and imports of goods of selected euro area countries

(as a percentage of the total)

	Exports			Imports		
	2006 Q1	2007 Q1	2008 Q1	2006 Q1	2007 Q1	2008 Q1
Germany	...	...	...	40.9	43.2	46.1
Ireland	46.6	41.8	42.5	19.4	16.6	20.0
Greece	28.1	25.6	18.4	18.0	21.8	26.6
Spain	53.0	55.3	61.3	42.7	44.8	47.0
France	44.6	44.4	43.2	41.1	39.2	41.3
Italy	53.1	55.6	58.5	26.4	30.4	32.6
Cyprus	...	...	16.9	...	...	1.8
Luxembourg	34.5	51.4	44.8	33.1	36.6	36.7
Austria	62.9	...	72.9	60.9	55.9	62.4
Portugal	50.7	57.8	66.2	43.8	42.5	49.7
Slovenia	...	76.9	79.4	...	63.1	65.3

Sources: National central banks/national statistical offices and ECB calculations.

Table 6 The euro's share in exports and imports of selected non-euro area countries

(as a percentage of the total)

	Exports													
	Exports invoiced/settled in euro							Export to the euro area						
	2001	2002	2003	2004	2005	2006	2007	2001	2002	2003	2004	2005	2006	2007
Non-euro area EU countries														
Bulgaria	48	52	61	62	60	58	...	48	48	48	46	51	48	48
Cyprus[1]	...	...	30	32	35	37	35	19	23	23	28	41	36	38
Czech Republic[2]	69	68	70	73	72	69	72	63	62	64	62	60	59	57
Estonia[2]	54	65	70	66	60	55	58	42	37	40	40	40	30	31
Latvia	34	40	42	48	53	55	60	30	29	30	25	25	24	21
Lithuania	28	37	47	50	51	56	57	26	27	28	31	29	25	25
Poland	57	60	65	69	70	70	70	59	58	58	57	55	35	
Romania	56	59	64	66	64	68	68	63	62	61	59	54	53	54
Slovakia	71	74	79	91	95	96	96	57	58	60	58	54	52	52
EU candidate countries														
Croatia	63	69	72	69	71	72	74	62	58	62	59	55	54	51
FYR Macedonia	...	66	67	75	75	74	71	48	50	53	53	50	52	51
Turkey	43	47	49	49	48	48	50	43	42	43	41	40	39	38
Other countries														
Indonesia	1	2	2	2	2	2	2	11	11	11	10	10	10	10
Thailand	3	3	3	3	3	3	3	12	11	11	11	10	10	10
Ukraine	...	4	5	6	7	9	9	16	18	19	17	16	15	15

	Imports													
	Imports invoiced/settled in euro							Imports from the euro area						
	2001	2002	2003	2004	2005	2006	2007	2001	2002	2003	2004	2005	2006	2007
Non-euro area EU countries														
Bulgaria	56	60	63	64	60	59	...	44	45	45	43	41	46	43
Cyprus[1]	...	...	45	53	55	56	55	40	43	45	53	55	54	55
Czech Republic[2]	67	67	68	71	71	68	68	58	57	56	56	53	60	59
Estonia[2]	54	59	62	60	59	56	59	39	41	40	47	46	43	41
Latvia	45	52	50	53	59	61	67	40	41	39	34	34	36	36
Lithuania	38	49	53	55	51	54	55	35	36	36	37	33	34	36
Poland	58	60	60	62	61	59	59	53	54	54	53	59	57	57
Romania	61	66	68	71	71	73	72	53	54	54	51	48	49	53
Slovakia	...	61	66	73	76	74	82	47	47	52	48	45	43	42
EU candidate countries														
Croatia	73	77	78	78	74	73	74	58	58	58	56	53	52	51
FYR Macedonia	...	68	71	75	71	69	70	47	49	47	42	38	36	47
Turkey	33	37	40	40	38	38	36	38	39	39	38	34	31	30
Other countries														
Indonesia	3	6	6	6	4	4	4	10	9	9	9	8	8	8
Thailand	5	5	4	5	4	4	4	10	9	8	8	7	7	7
Ukraine	...	11	15	14	18	20	21	19	21	21	21	20	25	26

Sources: IMF and national sources. Data for non-euro area EU countries have been provided by the national central banks of the ESCB. Data for Croatia, the former Yugoslav Republic of Macedonia and Turkey have been kindly provided by the Croatian National Bank, the State Statistical Office of the ormer Yugoslav Republic of Macedonia and the Turkish Undersecretariat of the Ministry for Foreign Trade.
1) Data refer to the period before Cyprus adopted the euro.
2) As a result of changes in the way data are collected from 2004 onwards, more recent figures for the Czech Republic and Estonia are not comparable with previous years.

Table 7 Outstanding international loans, by currency

	All cross-border loans[1]				Loans by banks outside the euro area to borrowers outside the euro area[2]			
	EUR	USD	JPY	Other	EUR	USD	JPY	Other
Outstanding amounts in USD billions, at current exchange rates, end of period								
1999	260	1,106	216	277	38	314	40	122
2000	287	1,112	191	266	43	291	47	107
2001	311	1,268	188	262	51	291	47	96
2002	380	1,242	106	506	79	263	50	113
2003	521	1,465	116	571	110	292	44	154
2004	667	1,612	152	647	157	296	42	171
2005	641	1,888	118	776	141	385	58	196
2006	835	2,547	121	1,014	173	497	51	285
2007 Q1	925	2,777	126	1,064	184	512	54	311
Q2	991	3,001	126	1,147	218	562	51	344
Q3	1,112	3,035	166	1,216	246	589	68	363
Q4	1,214	2,968	182	1,296	300	646	73	389
2008 Q1	1,419	3,217	265	1,382	313	688	101	388
Q2	1,397	3,080	193	1,352	308	724	79	391
Q3	1,251	3,152	218	1,301	294	730	98	370
Q4	1,151	2,680	168	1,192	231	712	77	291
Percentage of outstanding amounts, at constant exchange rates, end of period								
1999	18.1	55.4	12.2	14.4	9.9	59.1	8.5	22.5
2000	20.7	53.6	11.7	13.9	12.3	55.7	11.4	20.7
2001	21.2	54.7	11.7	12.4	15.1	54.3	12.6	18.1
2002	21.1	51.9	5.8	21.3	19.1	48.2	12.0	20.7
2003	21.0	53.7	5.0	20.3	19.6	47.2	8.4	24.8
2004	22.2	52.5	5.6	19.8	23.8	44.0	7.0	25.2
2005	21.2	53.1	4.3	21.4	20.2	46.8	9.1	23.8
2006	19.4	56.1	3.5	21.0	17.7	48.3	6.5	27.4
2007 Q1	19.7	56.6	3.3	20.4	17.8	47.3	6.5	28.4
Q2	19.4	57.0	3.3	20.4	18.8	46.9	5.8	28.5
Q3	20.0	55.5	3.9	20.7	18.9	46.2	6.7	28.1
Q4	20.7	53.5	4.0	21.7	20.2	46.0	6.4	27.4
2008 Q1	20.7	53.3	4.8	21.2	18.9	47.2	7.6	26.2
Q2	21.3	53.2	3.9	21.7	18.4	49.1	6.2	26.2
Q3	20.7	53.7	4.3	21.2	19.1	48.7	7.6	24.6
Q4	22.2	51.6	3.2	23.0	17.6	54.3	5.9	22.2
Percentage of outstanding amounts, at current exchange rates, end of period								
1999	14.0	59.5	11.6	14.9	7.4	61.1	7.8	23.7
2000	15.5	59.9	10.3	14.3	8.8	59.7	9.6	21.9
2001	15.4	62.5	9.3	12.9	10.6	60.0	9.6	19.8
2002	17.0	55.6	4.7	22.7	15.6	52.1	9.9	22.4
2003	19.5	54.8	4.4	21.4	18.3	48.7	7.3	25.7
2004	21.7	52.4	4.9	21.0	23.5	44.4	6.3	25.7
2005	18.7	55.2	3.4	22.7	18.1	49.4	7.4	25.1
2006	18.5	56.4	2.7	22.4	17.2	49.4	5.1	28.3
2007 Q1	18.9	56.8	2.6	21.8	17.4	48.3	5.1	29.3
Q2	18.8	57.0	2.4	21.8	18.6	47.8	4.3	29.3
Q3	20.1	54.9	3.0	22.0	19.4	46.5	5.3	28.7
Q4	21.5	52.4	3.2	22.9	21.3	45.9	5.2	27.6
2008 Q1	22.6	51.2	4.2	22.0	21.0	46.2	6.8	26.0
Q2	23.2	51.1	3.2	22.4	20.5	48.2	5.2	26.0
Q3	21.1	53.2	3.7	22.0	19.7	48.9	6.6	24.8
Q4	22.2	51.6	3.2	23.0	17.6	54.3	5.9	22.2

Sources: BIS and ECB calculations.
Note: Excluding interbank loans.
1) Including loans to/from Japan, Switzerland, the United Kingdom and the United States in their domestic currency.
2) Excluding loans to/from Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

Table 8 Outstanding international deposits, by currency

	All cross-border deposits[1]				Deposits by depositors outside the euro area in banks outside the euro area[2]			
	EUR	**USD**	**JYP**	**Other**	**EUR**	**USD**	**JYP**	**Other**
Outstanding amounts in USD billions, at current exchange rates, end of period								
1999	394	1,137	89	277	90	429	40	86
2000	389	1,303	84	287	78	474	29	85
2001	464	1,436	84	404	103	512	35	188
2002	598	1,542	93	507	135	455	28	235
2003	812	1,898	84	613	192	531	40	282
2004	989	2,198	112	703	239	539	34	326
2005	920	2,362	116	728	240	652	55	331
2006	1,097	3,062	135	938	292	842	46	422
2007 Q1	1,161	3,390	155	978	316	899	51	438
Q2	1,254	3,629	131	1,028	338	959	51	456
Q3	1,271	3,813	157	1,126	362	1,004	63	487
Q4	1,379	3,855	146	1,175	431	1,082	49	517
2008 Q1	1,596	3,962	222	1,216	467	1,089	73	517
Q2	1,589	4,028	145	1,227	454	1,037	57	533
Q3	1,446	3,833	168	1,130	446	1,025	69	482
Q4	1,315	3,474	126	948	398	957	59	417
Percentages of outstanding amounts, at constant exchange rates, end of period								
1999	26.4	54.9	4.8	13.9	18.2	62.6	6.5	12.7
2000	25.3	56.7	4.6	13.3	16.3	66.3	5.2	12.2
2001	26.9	52.7	4.4	15.9	17.8	55.8	5.5	20.8
2002	26.8	52.1	4.1	17.0	19.6	49.6	5.4	25.4
2003	25.8	54.7	2.9	16.6	19.9	49.8	4.4	25.9
2004	25.5	55.4	3.2	15.9	21.5	47.4	3.4	27.7
2005	25.3	55.0	3.5	16.2	21.2	49.0	5.3	24.5
2006	22.1	58.4	3.4	16.0	19.0	52.0	3.7	25.2
2007 Q1	21.4	59.7	3.6	15.4	19.2	52.3	3.9	24.6
Q2	21.5	60.4	3.0	15.1	19.2	52.8	3.9	24.2
Q3	20.0	61.1	3.2	15.8	18.6	52.6	4.2	24.5
Q4	20.5	60.5	2.8	16.2	19.9	52.9	2.9	24.3
2008 Q1	21.0	59.3	3.6	16.0	19.8	52.4	3.9	23.9
Q2	21.0	60.3	2.5	16.2	19.9	51.4	3.3	25.5
Q3	21.7	59.2	3.0	16.0	21.6	51.0	4.0	23.4
Q4	22.4	59.2	2.1	16.2	21.7	52.3	3.2	22.8
Percentages of outstanding amounts, at current exchange rates, end of period								
1999	20.8	60.0	4.7	14.6	13.9	66.5	6.2	13.4
2000	18.9	63.2	4.1	13.9	11.7	71.1	4.4	12.8
2001	19.4	60.1	3.5	16.9	12.3	61.1	4.2	22.4
2002	21.8	56.3	3.4	18.5	15.7	52.8	4.4	27.2
2003	23.8	55.7	2.5	18.0	18.4	50.8	3.8	27.0
2004	24.7	54.9	2.8	17.6	21.0	47.4	3.0	28.6
2005	22.3	57.2	2.8	17.7	18.7	51.0	4.3	25.9
2006	21.0	58.5	2.6	17.9	18.2	52.5	2.9	26.4
2007 Q1	20.4	59.6	2.7	17.2	18.5	52.8	3.0	25.7
Q2	20.8	60.1	2.2	17.0	18.7	53.2	2.9	25.3
Q3	20.0	59.9	2.5	17.7	18.9	52.4	3.3	25.4
Q4	21.0	58.8	2.2	17.9	20.7	52.0	2.3	24.9
2008 Q1	22.8	56.6	3.2	17.4	21.8	50.7	3.4	24.1
Q2	22.7	57.6	2.1	17.6	21.8	49.8	2.7	25.6
Q3	22.0	58.3	2.6	17.2	22.1	50.7	3.4	23.8
Q4	22.4	59.3	2.1	16.2	21.7	52.3	3.2	22.8

Sources: BIS and ECB calculations.
Note: Excluding interbank loans and deposits.
1) Including deposits in/of Japan, Switzerland, the United Kingdom and the United States in their domestic currency.
2) Excluding deposits in/of Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

Table 9 Countries with exchange rate regimes linked to the euro

(as at 1 March 2009)

Region	Exchange rate regimes	Countries
European Union (non-euro area)	ERM II	Denmark, Estonia,[1] Latvia,[2] Lithuania[1]
	Euro-based currency boards	Bulgaria
	Peg arrangements with fluctuation based on the euro	-
	Managed floating with the euro as reference currency	Romania
	Pro memoria: Independent floating	Czech Republic,[3] Hungary,[4] Poland, Sweden, United Kingdom
Candidate and potential candidate countries	Unilateral euroisation	Kosovo, Montenegro
	Euro-based currency boards	Bosnia and Herzegovina
	Peg arrangements or managed floating with the euro as reference currency	Croatia, former Yugoslav Republic of Macedonia, Serbia[5]
	Pro memoria: Independent floating	Albania, Turkey
Others	Euroisation	European microstates,[6] French territorial communities[7]
	Peg arrangements based on the euro	CFA franc zone,[8] French overseas territories,[9] Cape Verde, Comoros
	Peg arrangements and managed floats based on the SDR and other currency baskets involving the euro (share of the euro)	Seychelles (59.1%),[10] Russian Federation (45%),[11] Singapore, Azerbaijan (30%),[12] Libya,[13] Kuwait,[14] Syria,[15] Botswana,[16] Algeria, Morocco,[17] Tunisia,[18] Fiji,[19] Samoa,[20] Tonga, Vanuatu[21]

Sources: IMF and ECB compilation.
1) Unilateral commitment to a currency board.
2) Unilateral commitment to an exchange rate fluctuation band of +/-1%.
3) The Ceska narodni banka (CNB) has not engaged in direct interventions in the foreign exchange market.
4) Hungary let the forint float freely on 25 February 2008.
5) In December 2008 the National Bank of Serbia's Monetary Policy Committee adopted a Memorandum on Inflation Targeting as a Monetary Strategy, which defines the main principles of using a inflation targeting regime as the official monetary policy strategy from 1 January 2009.
6) Republic of San Marino, Vatican City, Principality of Monaco, Andorra. The community concluded monetary and exchange rate agreements with the Republic of San Marino, Vatican City and the Principality of Monaco. Negotiations with Andorra have started.
7) Saint-Pierre-et-Miquelon, Mayotte.
8) WAEMU (Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo) and CAEMC (Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon).
9) French Polynesia, New Caledonia, Wallis and Futuna.
10) Weighted (trade and tourism receipts) basket of currencies comprising the euro, the US dollar and the pound sterling (in October 2006, the currency composition of the basket was reduced from six to three currencies).
11) Trade-weighted currency basket for monitoring and setting ceilings for real appreciation (combined share of euro and euro-linked currencies of around 60%); since February 2005 dollar-euro basket for daily exchange rate management (since February 2007 euro share of 45%).
12) Bi-currency basket against dollar (70%) and euro (30%), changed on 11 March 2008 from 80% and 20% respectively.
13) The rate of exchange is established using a basket of SDR currencies with a fluctuation margin of 25%.
14) The currency was pegged to a basket of international currencies in May 2007.
15) In August 2007, the authorities moved from the de facto peg to the US dollar regime to an SDR basket within a relatively wide margin.
16) Weighted basket of currencies comprising the SDR and the South African rand.
17) Weighted basket in accordance with the distribution of Morocco's foreign trade and the pattern of currencies of settlement.
18) Real effective exchange rate target.
19) Trade-weighted currency basket.
20) The central bank maintains an exchange rate peg based on a basket of the currencies of Samoa's six main trading partners.
21) Weighted (trade and tourism receipts) basket of currencies of Vanuatu's major trading partners.

Table 10 Global holdings of foreign exchange reserves, by currency

	All countries					Advanced economies					Emerging and developing economies				
	Total (incl. unallocated reserves)	EUR	USD	JPY	Other (excl. unallocated reserves)	Total (incl. unallocated reserves)	EUR	USD	JPY	Other (excl. unallocated reserves)	Total (incl. unallocated reserves)	EUR	USD	JPY	Other (excl. unallocated reserves)
Outstanding amounts in USD billions, at current exchange rates															
1999	1,782	247	980	88	65	1,108	172	701	701	48	674	75	279	15	17
2000	1,936	278	1,080	92	69	1,203	191	768	768	51	733	87	312	12	18
2001	2,050	301	1,122	79	67	1,232	200	786	786	49	818	101	336	11	18
2002	2,408	427	1,205	78	86	1,419	276	842	842	63	989	152	363	12	23
2003	3,025	559	1,466	88	111	1,739	335	1,033	1,033	73	1,286	224	432	11	38
2004	3,748	659	1,751	102	144	2,041	389	1,215	1,215	90	1,707	269	536	14	54
2005	4,175	684	1,903	102	155	2,048	359	1,245	1,245	87	2,127	325	657	18	68
2006	5,037	832	2,171	102	210	2,219	411	1,333	1,333	107	2,818	421	838	18	103
2007 Q1	5,362	884	2,295	101	232	2,257	418	1,362	1,362	110	3,105	466	933	21	121
Q2	5,721	941	2,424	103	251	2,290	431	1,372	1,372	118	3,431	510	1,051	22	132
Q3	6,043	1,018	2,500	104	273	2,346	461	1,388	1,388	131	3,697	558	1,112	23	142
Q4	6,398	1,082	2,642	120	275	2,395	484	1,405	1,405	126	4,004	598	1,236	35	149
2008 Q1	6,886	1,169	2,768	138	307	2,506	526	1,434	1,434	140	4,380	644	1,334	44	167
Q2	7,011	1,186	2,782	149	311	2,471	508	1,414	1,414	139	4,540	678	1,368	56	172
Q3	6,893	1,117	2,808	141	295	2,403	462	1,424	1,424	128	4,489	655	1,384	50	167
Q4	6,713	1,117	2,698	138	261	2,464	473	1,460	1,460	111	4,248	644	1,238	39	150
Currency shares in foreign exchange reserves with disclosed currency composition at constant exchange rates															
1999	…	23.1	66.0	6.7	4.2	…	22.3	65.7	7.7	4.3	…	24.9	66.9	4.2	4.0
2000	…	24.7	64.2	6.9	4.2	…	23.7	63.6	8.5	4.3	…	27.3	65.7	3.1	3.9
2001	…	26.7	63.0	6.4	3.9	…	25.3	62.8	7.9	4.1	…	30.1	63.4	3.0	3.5
2002	…	29.0	61.5	5.2	4.3	…	27.0	62.1	6.4	4.5	…	33.4	60.3	2.6	3.6
2003	…	27.0	64.1	4.5	4.4	…	23.7	66.2	5.8	4.3	…	34.0	59.6	1.8	4.6
2004	…	25.3	65.8	4.3	4.6	…	22.2	67.9	5.5	4.4	…	31.6	61.5	1.9	5.0
2005	…	27.1	63.8	4.4	4.7	…	22.8	67.0	5.9	4.3	…	34.1	58.5	2.1	5.4
2006	…	26.2	64.6	4.0	5.2	…	22.1	67.7	5.6	4.6	…	32.0	60.3	1.7	6.0
2007 Q1	…	26.1	64.8	3.7	5.4	…	21.9	68.2	5.2	4.7	…	31.5	60.3	1.8	6.4
Q2	…	25.9	64.8	3.7	5.5	…	21.9	67.7	5.4	4.9	…	30.7	61.4	1.7	6.2
Q3	…	25.9	64.9	3.5	5.8	…	22.0	67.6	5.0	5.3	…	30.4	61.7	1.7	6.2
Q4	…	25.3	65.4	3.7	5.5	…	22.1	67.7	5.1	5.1	…	28.8	63.0	2.2	6.0
2008 Q1	…	24.5	65.9	3.6	6.0	…	21.8	67.7	4.9	5.6	…	27.2	64.1	2.3	6.4
Q2	…	24.6	65.3	4.1	6.0	…	21.5	67.7	5.2	5.7	…	27.6	63.1	3.0	6.3
Q3	…	25.2	65.1	3.8	5.9	…	21.5	68.1	5.0	5.4	…	28.7	62.3	2.6	6.4
Q4	…	26.5	64.0	3.3	6.2	…	22.1	68.1	4.6	5.2	…	31.1	59.8	1.9	7.2
Currency shares in foreign exchange reserves with disclosed currency composition at current exchange rates															
1999	…	17.9	71.0	6.4	4.7	…	17.3	70.5	7.3	4.9	…	19.4	72.3	4.0	4.3
2000	…	18.3	71.1	6.1	4.5	…	17.5	70.5	7.4	4.6	…	20.2	72.9	2.7	4.2
2001	…	19.2	71.5	5.0	4.3	…	18.1	71.3	6.2	4.4	…	21.6	72.1	2.3	3.9
2002	…	23.8	67.1	4.4	4.8	…	22.1	67.5	5.3	5.0	…	27.6	66.0	2.2	4.2
2003	…	25.2	65.9	3.9	5.0	…	22.1	68.1	5.0	4.8	…	31.7	61.3	1.6	5.4
2004	…	24.8	65.9	3.8	5.4	…	21.9	68.2	4.9	5.0	…	30.8	61.4	1.7	6.2
2005	…	24.0	66.9	3.6	5.5	…	20.2	70.1	4.7	4.9	…	30.4	61.5	1.7	6.4
2006	…	25.1	65.5	3.1	6.3	…	21.2	68.9	4.3	5.5	…	30.5	60.7	1.3	7.5
2007 Q1	…	25.2	65.3	2.9	6.6	…	21.2	69.1	4.1	5.6	…	30.2	60.5	1.4	7.9
Q2	…	25.3	65.2	2.8	6.7	…	21.5	68.5	4.0	5.9	…	29.7	61.3	1.3	7.7
Q3	…	26.1	64.2	2.7	7.0	…	22.4	67.3	3.9	6.4	…	30.4	60.6	1.3	7.7
Q4	…	26.3	64.1	2.9	6.7	…	23.1	66.9	4.1	6.0	…	29.6	61.3	1.7	7.4
2008 Q1	…	26.7	63.2	3.2	7.0	…	24.0	65.3	4.3	6.4	…	29.4	61.0	2.0	7.6
Q2	…	26.8	62.8	3.4	7.0	…	23.6	65.6	4.3	6.5	…	29.8	60.2	2.5	7.6
Q3	…	25.6	64.4	3.2	6.8	…	22.0	67.7	4.3	6.1	…	29.0	61.3	2.2	7.4
Q4	…	26.5	64.0	3.3	6.2	…	22.1	68.1	4.6	5.2	…	31.1	59.8	1.9	7.2

Sources: IMF and ECB calculations.

Table 11 Currency composition of foreign exchange reserves for selected countries

	2005	2006	2007	July 2008	Aug. 2008	Sep. 2008	Oct. 2008	Nov. 2008	Dec. 2008
Share of euro in foreign exchange reserve holdings as a percentage of total, at current exchange rates									
Non-euro area EU and EU candidate countries									
Bulgaria	90.39	91.89	93.49	92.47	92.88	92.74	92.38	92.53	92.42
Croatia	85.13	85.48	85.35			74.52	79.60		76.77
Latvia	55.81	46.36	42.55		48.83	50.96	54.17	52.24	61.95
Lithania	100.00	100.00	100.00						100.00
Slovakia	77.76	72.74	81.49	82.18	81.36	80.93	79.43	79.29	93.28
Sweden	37.00	50.00	50.00						50.00
United Kingdom	64.87	66.81	68.52			37.03			41.43
Other industrial countries									
Canada	43.69	51.01	50.21	51.06	45.25	43.94	42.75	39.67	41.47
Norway	48.56	60.40	59.40			60.40			61.60
Switzerland	47.00	48.00	47.00						49.38
Unite States	57.64	61.16	47.46			60.60			57.42
Latin American countries									
Chile	27.48	24.87	37.06			36.45			38.23
Peru	80.80	81.82	87.08	85.28	86.11	86.57	86.52	85.89	84.55
Uruguay	14.51	1.34	14.23	16.56	15.55	15.18	14.76	12.98	9.98

Sources: National central banks and ECB calculations.

Table 12 Outstanding euro-denominated bank deposits in selected countries and dependent territories

	Absolute amounts (EUR millions)			As a % of total deposits		As a % of foreign deposits	
	2007	2008	as of	2007	2008	2007	2008
New Member States							
Bulgaria	7,096	8,258	Dec. 2008	40.2	42.2	81.5	83.8
Czech Republic	6,838	7,277	Jan. 2009	7.7	7.6	70.2	77.1
Hungary	6,375	6,830	Feb. 2009	13.8	15.4	73.7	79.6
Latvia	2,959	3,917	Dec. 2008	38.3	45.1	81.9	89.0
Lithuania	1,662	2,244	Dec. 2008	16.0	21.6	75.2	82.8
Poland	10,007	8,531	Dec. 2008	7.5	6.1	62.7	63.7
Romania	9,663	11,779	Dec. 2008	27.1	30.7	84.4	88.3
Slovakia	7,587	9,736	Dec. 2008	14.9	14.3	67.1	83.6
Average new Member States				*20.7*	*22.9*	*74.6*	*81.0*
Candidate countries							
Croatia	13,792	15,781	Dec. 2008	51.0	55.1	98.2	96.6
FYR Macedonia	939	1,208	Dec. 2008	44.8	51.7	84.4	87.4
Turkey	29,226	30,100	Dec. 2008	14.3	14.2	40.6	40.6
Potential candidate countries							
Albania	1,577	1,667	Jan. 2009	30.5	32.5	71.3	73.7
Bosnia & Herzegovina	2,753	2,791	Dec. 2008	44.4	45.4	90.3	90.5
Montenegro[1]	2,044	1,906	Dec. 2008	97.8	97.3	n.a	n.a
Serbia	n.a	7,411	Jan. 2009	n.a	66.3	n.a	89.6
Other non-euro area Europe							
Norway	6,589	12,554	Jan. 2009	17.8	20.8	37.0	31.0
Sweden	32,733	51,446	Dec. 2008	8.3	11.1	32.3	33.3
Switzerland	34,287	39,955	Dec. 2008	10.8	9.6	44.1	37.1
United Kingdom	1,542,499	1,449,375	Dec. 2008	23.6	24.8	n.a	n.a
Middle East and North Africa							
Israel	8,546	9,795	Nov. 2008	6.9	6.7	21.7	22.4

Sources: National central banks and ECB calculations.
Note: Data may be subject to revisions.
1) The euro is legal tender.

Table 13 Outstanding euro-denominated bank loans in selected countries and dependent territories

	Absolute amounts (EUR millions)			As a % of total loans		As a % of foreign loans	
	2007	2008	as of	2007	2008	2007	2008
New Member States							
Bulgaria	9,288	13,945	Dec. 2008	49.1	54.8	98.1	96.5
Czech Republic	6,805	9,014	Jan. 2009	10.2	12.0	78.6	83.6
Hungary	11,962	14,695	Feb. 2009	20.1	22.4	35.2	32.9
Latvia	15,360	18,246	Dec. 2008	83.4	85.2	96.6	96.5
Lithuania	8,934	12,643	Dec. 2008	51.9	60.8	94.7	95.2
Poland	9,644	12,240	Dec. 2008	7.3	7.8	30.62	4.0
Romania	19,447	24,632	Dec. 2008	47.5	49.0	87.4	84.9
Slovakia	6,627	7,610	Dec. 2008	17.6	15.3	85.5	84.6
Average new Member States				*35.9*	*38.4*	*75.8*	*74.8*
Candidate countries							
Croatia	12,718	16,307	Dec. 2008	43.3	47.4	69.6	72.2
FYR Macedonia	462	577	Dec. 2008	22.1	20.4	92.3	91.0
Turkey	6,519	6,457	Dec. 2008	4.7	4.6	43.3	37.4
Potential candidate countries							
Albania	1,523	2,045	Jan. 2009	63.5	63.8	87.6	87.3
Bosnia & Herzegovina	4,216	5,127	Dec. 2008	68.9	68.9	93.9	93.4
Montenegro[1]	2,169	2,606	Dec. 2008	96.6	94.1	n.a	n.a
Serbia	n.a	6,973	Jan. 2009	n.a	58.8	n.a	67.3
Other non-euro area Europe							
Norway	11,272	9,177	Jan. 2009	3.8	3.2	37.0	21.9
Sweden	61,306	73,280	Dec. 2008	9.8	11.5	50.4	47.8
Switzerland	28,246	27,304	Dec. 2008	4.5	3.9	21.4	22.9
United Kingdom	1,033,216	841,316	Dec. 2008	21.7	21.4	n.a	n.a
Middle East and North Africa							
Israel	2,965	3,694	Nov. 2008	3.2	3.1	16.1	17.5

Sources: National central banks and ECB calculations.
Note: Data may be subject to revisions.
1) The euro is legal tender.

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