



EUROPEAN CENTRAL BANK

EUROSYSTEM

REVIEW OF THE INTERNATIONAL ROLE OF THE EURO JUNE 2007

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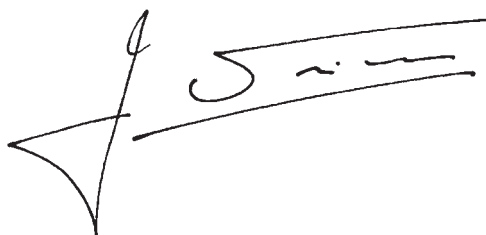
## FOREWORD

This report is the sixth Review of the international role of the euro. Like previous issues, it reflects the ongoing efforts of the European Central Bank (ECB) to monitor and analyse the role played by the euro in global markets and countries outside the euro area. In so doing, it not only provides information on the extent of the international use of the euro, i.e. its use by market participants and authorities outside the euro area, but also sheds light on the factors driving developments in the international use of the euro. Starting with this issue, the Review will be published mid-year. This change makes it possible to present end of year data for all major components of the international role of the euro in a timely fashion. Hence, exceptionally, in this edition, the period under review covers an eighteen-month time span (from mid-2005 to the end of 2006).

Over the review period, developments in the international use of the euro have differed across global market segments. While the international role of the euro declined slightly in a number of segments, namely international debt securities, international deposits and loans, foreign exchange and invoicing of imports of goods, in other segments it continued to show a significant degree of stability or a gradual expansion.

This review confirms that a strong institutional and regional pattern continues to characterise the internationalisation of the euro. Further evidence of this pattern is provided by the analysis of trends and determinants of asset substitution in central, eastern and south-eastern Europe, which is the subject of the “special focus” section of the current review.

Developments in the international use of the euro are the outcome of decisions taken by market participants. The ECB will continue to monitor the international role of the euro and to provide regular information to the public on related developments in the international financial arena.



Jean-Claude Trichet

President of the European Central Bank



## EXECUTIVE SUMMARY

This is the sixth Review of the international role of the euro. Like previous issues, it examines the role of the euro in global markets and countries outside the euro area and aims to enhance the Eurosystem's understanding of the current state of the internationalisation of the euro by identifying the main developments and underlying trends. Moreover, it builds on the continued efforts of the European System of Central Banks (ESCB) to develop the statistical coverage and analysis of the international use of the euro.

Starting with this issue, the Review of the international role of the euro will be published mid-year. This change allows for end of year data for all major components of the international role of the euro to be presented in a timely fashion. Hence, in this edition, the period under review extends from mid-2005 to the end of 2006.

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

### INTERNATIONAL DEBT MARKETS

Over the review period, the euro share in the stock of international debt securities declined by around 2.5 percentage points, reaching 31.4% in December 2006. The decline was most pronounced in the market for long-term securities, mainly as the indirect effect of a large increase in the issuance of bonds and notes denominated in US dollars. The financial sector has been the major issuer of euro-denominated bonds and notes, whereas the share of corporate and sovereign issuances in international euro-denominated debt has been declining. Geographically, borrowers from non-euro area European Union (EU) Member States and mature market economies continue to dominate the euro-denominated international bond market.

### INTERNATIONAL LOAN AND DEPOSIT MARKETS

Over the review period, the euro share declined in both the international loan and international deposit markets, by almost 1.5 percentage points and by about 3 percentage points, respectively. In the fourth quarter of 2006, according to the narrow measure, i.e. cross-border transactions denominated in a currency which is neither the home currency of the borrower nor that of the lender, the euro share accounted for around 17% of the international loan markets and 18% of the international deposit markets. Geographical trends reveal a growing role by emerging countries neighbouring the euro area in attracting euro-denominated loans, which rose by around 100% over the review period.

### FOREIGN EXCHANGE MARKETS

The average euro share in daily settlements of foreign exchange trades via Continuous Linked Settlement (CLS) fell to around 39% during the period under review, compared with close to 41% in the previous review period.<sup>1</sup> This fall has to be interpreted against the background of an expansion in the number of currencies traded within CLS, which also affected the Japanese yen (down to around 19% from close to 21%) and the pound sterling (down to around 14% from slightly above 15%). In contrast, the US dollar share remained stable at around 93%, reflecting the dominant role of the US dollar as a vehicle currency in global foreign exchange markets.

### THE USE OF THE EURO IN INTERNATIONAL TRADE

The role of the euro as a settlement currency for exports of goods from euro area countries appears to have stabilised, while its share in the invoicing and settlement of imports of goods displayed a notable fall during the review period, possibly related to developments in energy markets. In contrast, its upward trend

<sup>1</sup> 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.

seems to have continued for exports and imports of services.

In the first quarter of 2006 the Eurosystem conducted a special data collection exercise, which for the first time provides an overview of the currency of invoicing of euro area trade in goods with non-EU countries. The results suggest that the euro share in transactions relating to exports is close to 50%, while for imports it amounts to about 35%. This is in line with the pattern observed for the use of the euro as an invoicing or settlement currency for total exports and imports of individual euro area countries outside the euro area.

With regard to the euro share in non-euro area countries, recent data indicate that institutional factors, such as being an EU Member State or an EU candidate country, are highly significant in explaining the use of the euro in international trade. Accordingly, the euro share in the invoicing or settlement of trade continues to outstrip the share of trade with the euro area in non-euro area EU members and EU candidate countries, a pattern which cannot be observed for countries outside the immediate euro area neighbourhood. These findings provide additional support for the evidence reported in the Special Focus of the December 2005 Review on the determinants of the currency invoicing in international trade, namely that the use of the euro as an invoicing or settlement currency is most prominent in countries and regions neighbouring the euro area.

### THIRD COUNTRIES

During the review period, the euro maintained its role as an exchange rate anchor for countries in the geographic proximity of the EU and countries that have established special institutional arrangements with the EU or its Member States. Exchange rate regime changes involving the euro as an anchor currency took place in Slovenia, the Slovak Republic and Russia. Slovenia left ERM II at the end of 2006 as it adopted the euro on 1 January 2007. Slovakia joined ERM II in November 2005. In

Russia, the weight of the euro in the Central Bank of the Russian Federation's (Bank of Russia) operational basket for daily exchange rate management increased to 40% (from 35%) in December 2005. Outside the review period, in February 2007, the Bank of Russia reported that this share had further risen to 45%.

The use of the euro in foreign exchange reserves held by third countries, measured at current exchange rates, has moderately increased during the review period, mostly reflecting positive valuation effects for the euro. However, evidence on the currency composition of foreign exchange reserves has to be interpreted with caution as the significance of reserves or other foreign assets held by countries which do not disclose the currency composition of their reserve assets has increased during the review period. Moreover, foreign assets have been increasingly accumulated outside central banks in "sovereign wealth funds". Keeping in mind the limited coverage of the International Monetary Fund (IMF) data, the share of euro-denominated assets in global foreign exchange reserves, measured at current exchange rates, rose to 25.8% in December 2006 (up from 24.9% at the end of 2004). However, measured at constant exchange rates, the euro share in foreign exchange reserves has remained broadly stable since mid-2005. A breakdown of the IMF data on the currency composition of global foreign exchange reserves into sub-regions confirms that the role of the euro has increased most and is more pronounced in countries in the geographical neighbourhood of the euro area and in countries with an institutional link to the EU. Moreover, the analysis suggests that the choice of the currency composition of foreign exchange reserves is closely linked to anchor currency considerations, which is also supported by empirical and theoretical studies.

As far as the role of the euro as an intervention currency is concerned, several central banks in EU neighbouring countries continued to intervene in foreign exchange markets by using the euro as the intervention currency. In particular, this applies to some non-euro area

EU Member States and EU candidate countries. Public statements by the Bank of Russia suggest that there have also been interventions in the rouble/euro market, albeit at a substantially lower scale than in the rouble/US dollar market.

With regard to the private use of the euro as a parallel currency, the stock of banknotes shipped by banks to destinations outside the euro area has continued to increase gradually, while the size of respective net shipment flows has started to decline. However, transfers of euro banknotes to and from the euro area could also take place through channels other than Monetary Financial Institutions (MFIs). On the other hand, the share of euro-denominated deposits increased in most new Member States and EU candidate countries.

#### **ASSET SUBSTITUTION IN CENTRAL, EASTERN, AND SOUTH-EASTERN EUROPE – TRENDS AND DETERMINANTS**

Households and firms in central, eastern and south-eastern Europe have been increasingly using the euro for domestic financial transactions. In general, the use of a foreign currency as a store of value has been explained as the consequence of past macroeconomic instability and high inflation. More recently, the relative volatility of inflation compared with that of the real exchange rate as well as weak governance have been identified as factors contributing to the presence of foreign currency-denominated financial contracts and the inertia of this phenomenon. As regards the use of the euro in central, eastern and south-eastern Europe, there are several specific factors that might have been supporting its role as the preferred currency for asset substitution, namely the geographical proximity of the EU – implying trade, financial, migration and tourism links – the institutional anchor of prospective EU and EMU membership, as well as the role of the euro as an external anchor in countries' exchange rate policies.

New empirical evidence indicates that the access to foreign funds which has accompanied the increasing presence of foreign banks, mainly from the euro area, has indeed contributed to the rise in foreign currency lending in central, eastern and south-eastern Europe. By contrast, the share of foreign currency deposits in total deposits seems to be negatively affected by greater access by domestic banks to foreign funds. Finally, interest rate differentials and the trade-off between inflation and real exchange rate variability may have also influenced agents' decisions regarding the use of domestic versus foreign currency in denominating loans and deposits.

#### **CONCLUSIONS**

Over the review period, developments in the international use of the euro have differed across global market segments. While the international role of the euro declined slightly in a number of segments, namely international debt securities, international deposits and loans, foreign exchange and invoicing of imports of goods, in other segments it continued to show a significant degree of stability or a gradual expansion. In particular, with regard to the use of the euro by third countries, taking into account the shortcomings of the available data and valuation effects, the use of the euro as a reserve currency increased slightly. Moreover, demand for euro banknotes and euro-denominated deposits by private agents in third countries has continued to increase gradually. In line with the conclusions drawn in previous reports, this Review finds the internationalisation of the euro to be characterised by a strong institutional and regional pattern.

## Key data

	This Review (latest data available)	Compared with previous Review
Euro share in:		
– narrowly defined stock of international debt securities <sup>1)</sup>	2006 Q4: 31.4%	2005 Q2: 33.7%
– all cross-border loans	2006 Q4: 19.8%	2005 Q1: 21.2%
– cross-border loans from non-euro area banks to non-bank borrowers outside the euro area <sup>1)</sup>	2006 Q4: 16.7%	2005 Q1: 20.2%
– all cross-border deposits	2006 Q4: 21.6%	2005 Q1: 24.5%
– cross-border deposits of non-euro area non-banks in banks outside their country of residence excluding the euro area <sup>1)</sup>	2006 Q4: 18.0%	2005 Q1: 21.3%
– daily foreign exchange trading (settled by CLS) <sup>2)</sup>	July 2005 - Dec. 2006 (average): 39.3%	July 2004 - June 2005 (average): 40.7%
– settlement/invoicing of goods' exports from selected euro area countries to non-euro area countries	2005: 39% to 62%	2004: 44% to 63%
– settlement/invoicing of goods' imports of selected euro area countries from non-euro area countries	2005: 34% to 56%	2004: 41% to 61%
– euro share in global foreign exchange reserves (at current exchange rates)	end-2006: 25.8%	end-2004: 24.9%
Cumulative net shipments of euro banknotes to destinations outside the euro area	Dec. 2006: €60 billion	June 2005: €55 billion

1) At constant fourth quarter of 2006 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.



## INTRODUCTION

The objective of this review of the international use of the euro is twofold. It aims, first, at providing information on developments in the period from mid-2005 to the end of 2006 and, second, at enhancing the Eurosystem's understanding of the factors that underpin the international role of the euro.

Section A focuses on the global markets that constitute the environment for the euro as an international currency. This Review makes use of a number of diverse data sources, ranging from the Bank for International Settlements (BIS) to market sources that have been found to be helpful in providing a statistical framework for analysing the use of the euro. In this regard, the key objective of Section A is to provide information on developments in the use of the euro in these markets: It deals with international debt markets, international loan and deposit markets, foreign exchange markets and international trade.<sup>2</sup> For the first time, newly collected data on the currency breakdown of debt securities in the euro area balance of payments and international investment position are presented in this review. In addition, IMF data on the euro share in portfolio investment assets held by third countries in debt securities are presented for the first time. Finally, a special data collection exercise was conducted by the Eurosystem in the first quarter of 2006, providing evidence on the invoicing or settlement of trade by euro area countries with countries outside the EU.

Section B turns to the role of the euro in third countries, focusing, first, on authorities' choice of the euro as anchor, reserve or intervention currency in their exchange rate policies and, second, on the choice of private agents to use the euro as a parallel currency in the form of cash holdings or foreign currency deposits. In addition to its regular coverage, this Section also includes a box on the accumulation of foreign assets by "sovereign wealth funds", an assessment of BIS data on the currency composition of central bank deposits and a

survey of the academic literature on the currency composition of foreign exchange reserves. Additionally, a separate box is devoted to a comparison of euro and dollar banknote holdings by non-residents. Finally, Section B contains updated results from a survey on the use of the euro in central, eastern and south-eastern Europe carried out by the Oesterreichische Nationalbank.

While the regular sections of the report are mainly aimed at enhancing the available information, the special focus section allows for a longer and more in-depth analysis of a particular issue. This year, it features a survey on the degree of asset substitution in central, eastern and south-eastern Europe, with particular emphasis on the use of the euro as a currency for local bank lending to households and firms. It has been motivated by the increasing use of the euro for domestic financial transactions in the region, as documented in previous editions of this Review under the section entitled "Private use: The euro as a parallel currency in third countries".

<sup>2</sup> Throughout the Review, the data are presented with the currency denomination of their original source. Moreover, the Review does not study international equities, statistical coverage of which is more limited.

# A THE EURO IN GLOBAL MARKETS

## I THE EURO IN INTERNATIONAL DEBT MARKETS

*The euro share in the stock of international debt securities declined over the review period by around 2.5 percentage points, reaching 31.4% in December 2006. The decline was most pronounced in the market for long-term securities, mainly as the indirect effect of a large increase in the issuance of bonds and notes denominated in US dollars. The financial sector has been the major issuer of euro-denominated bonds and notes, whereas the share of corporate and sovereign issuances in international euro-denominated debt has been declining. Geographically, borrowers from non-euro area EU Member States and mature market economies continue to dominate the euro-denominated international bond market.*

This section reviews the role of the euro in international debt markets, which comprise instruments with both long-term maturities (bonds and notes) and short-term maturities (money market instruments).<sup>3</sup> As in previous years, the analysis focuses on the “narrow” definition of international securities, which comprises only issues in a currency other than the currency of the country in which the borrower resides (see Box 1 for a discussion of alternative definitions of international issuance).<sup>4</sup> With a view to analysing the main developments in the international debt securities market from mid-2005 to the end of 2006, sub-

section 1.1 reviews supply trends for debt securities as a whole, sub-section 1.2 covers trends across the various financing instruments, sub-section 1.3 presents the available evidence on demand trends and sub-section 1.4 gives evidence of the geographical distribution of issuers.

- <sup>3</sup> Bonds and notes have a maturity at issuance of more than one year, while money market instruments have a maturity at issuance of up to one year.
- <sup>4</sup> For further discussion of various analytical concepts with respect to proper measurement of the international roles of currencies in debt securities markets, see Detken, C. and P. Hartmann (2000).

### Box 1

#### ALTERNATIVE DEFINITIONS OF THE INTERNATIONAL ISSUANCE OF DEBT SECURITIES

An international bond is defined as a bond that is denominated in a currency which is either not the home currency of the issuer (borrower) or not that of the investor (lender). Thus, from a conceptual point of view, ideally, both the supply and the demand side of the market for international bonds should be taken into account when measuring the size of the international bond market and the shares of the currencies in this market.

For the sake of clarity and simplicity, a single “narrow” concept of international issuance of debt securities (i.e. bonds and notes, as well as money market instruments) is used throughout this Review. This narrow measure of international issuance is defined as issuance in a currency other than the currency of the country in which the borrower resides. Therefore, more pragmatically, it is only defined by the supply side of the market, i.e. by the nationality of the borrower compared with the currency of denomination, because the nationality of the investor – the ultimate lender – is usually unknown.

Other definitions of an international bond exist and, in the past, the ECB has referred to the following alternative measures: the “broad” measure and the “global” measure (see ECB, 2002 and 2001). The broad measure adds to the narrow measure the issuance of debt securities denominated in the home currency of the borrower, provided that this issuance “targets” the

international financial market. More precisely, 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 practice, this definition would like to take into account the available information on the demand side of the bond market, attempting to include those transactions in which the nationality of the investor differs from the currency denomination of the debt securities. However, taking the example of the euro, the "broad" measure may include euro-denominated securities for which both issuers and investors originate in the euro area, since the debt, although it "targets" the international market, might still be acquired in the primary market by a euro area resident. This means that the broad measure of the euro also includes purely intra-euro area financial transactions denominated in euro, which cannot be considered international from any perspective. Hence, the latter is an imperfect measure of an international bond issuance and, as such, it lacks the clarity and simplicity of the narrow measure.

The global measure of debt securities adds to the broad measure all domestic issues targeting the domestic market. The global measure provides a simple and clear indication of the world supply of debt securities denominated in a given currency, but does not distinguish between domestic and international bonds.

The table below reports the latest available data on these two alternative measures, compared to the narrow measure. As at the fourth quarter of 2006, the euro share in international debt markets stood at around 31% according to the narrow measure – the definition used in this review – at 47% according to the broad measure and at almost 28% according to the global measure.

#### Alternative measures of debt securities supply and major currencies' shares

(fourth quarter of 2006, values at current exchange rates)

	Amounts outstanding (USD billions)	Shares (%)		
		Euro	US dollar	Japanese yen
"Narrow" measure, excluding home currency issuance	7,857	31.4	44.1	5.3
"Broad" measure, including home currency issuance	18,435	47.0	36.3	2.7
"Global" measure, including domestic issuance	68,720	27.8	42.2	13.0

Sources: BIS and ECB calculations.

### 1.1 OVERALL TRENDS IN INTERNATIONAL DEBT SECURITIES SUPPLY

According to the ECB's narrow measure (see Box 1), net issuance of euro-denominated debt securities by non-euro area residents amounted to almost USD 390 billion between the third quarter of 2005 and the fourth quarter of 2006.<sup>5</sup> This corresponds to an average issuance of USD 65 billion per quarter, which is slightly lower than in the previous review period from the third quarter of 2004 to the second quarter of 2005, indicating a limited appetite for euro-

denominated debt issuances by non-euro area residents (see Table 1). This contrasts with the corresponding figure for US dollar-denominated issuance by non-US residents, which soared to a total amount of almost USD one trillion over the review period, more than twice as large as the narrow measure for the euro.

<sup>5</sup> Net issuance of debt securities is defined as gross issuance minus repayments.

**Table 1 Net issuance of international debt securities**

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

	Pro memoria: 2004 Q3-2005 Q2 Average quarterly	2005 Q3	2005 Q4	2006 Q1	2006 Q2	2006 Q3	2006 Q4	2005 Q3-2006 Q4	
								Average quarterly	Total
Euro	69.5	62.4	39.1	85.0	33.5	74.6	93.9	64.8	388.5
US dollar	59.3	66.1	134.4	143.6	142.8	187.2	284.0	159.7	958.1
Japanese yen	-2.2	2.5	1.8	-1.2	2.6	2.7	11.1	3.3	19.5
Total (incl. other currencies)	164.7	179.6	239.8	310.2	240.8	310.3	461.2	290.3	1,741.9

Sources: BIS and ECB calculations.

As a result of these developments, for the first time since the start of Economic and Monetary Union (EMU), the euro share in the stock of international debt securities, measured at constant exchange rates, declined, to 31.4% in December 2006 from 33.8% in June 2005 (see Chart 1).<sup>6</sup> In contrast, the US dollar share rose to 44.1% in December 2006, increasing by almost 3 percentage points over June 2005. The share of the Japanese yen continued to fall over the review period, reaching a trough of 5.3% in December 2006.

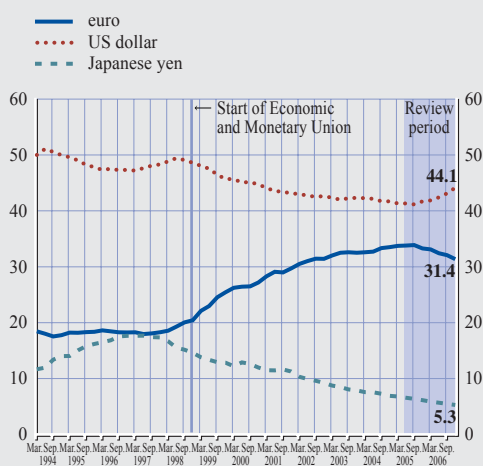
## 1.2 SPECIFIC TRENDS ACROSS FINANCING INSTRUMENTS

A closer look at the maturity of the gross issuance of international debt securities reveals that the euro share vis-à-vis the US dollar was relatively stable in the market for short-term securities, whereas it markedly declined in the market for long-term securities, mainly as a result of a large increase in the issuance of bonds and notes denominated in US dollars.

In the short-term international debt securities market, the euro share – measured at current exchange rates – recorded a marginal decline. Between June 2005 and December 2006, the euro share in gross issuance of international short-term securities stood on average at around 36%, which is 1 percentage point lower than in the previous review period (from the third quarter of 2004 to the second quarter of 2005) and corresponds to a gross amount of euro-denominated issues of roughly USD 880 billion. During the same period, the US dollar share in gross issuance of international money market instruments reached more than 38%, declining by 1 percentage point with respect to the previous review period, but remaining above the corresponding euro share. The Japanese

**Chart 1 Stock of international debt securities: currency shares**

(bonds and notes and money market instruments, excluding home currency issuance, as a percentage of the total amount outstanding and at 2006 Q4 exchange rates)



Sources: BIS and ECB.

<sup>6</sup> Currency shares related to debt securities data are (i) derived at constant 2006 Q4 exchange rates for stock data and (ii) at current exchange rates for flow data. Although correcting for exchange rate valuation effects may imply some imprecision, the currency valuation effect for stock data has been deemed too important to be neglected, as most stock variables cannot be adjusted by market participants in the face of exchange rate movements.



**Table 2 Major currencies' shares in gross issuance of short-term international debt securities**

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

	Pro memoria: 2004 Q3-2005 Q2 <sup>1)</sup>	2005 Q3	2005 Q4	2006 Q1	2006 Q2	2006 Q3	2006 Q4	2005 Q3-2006 Q4 <sup>1)</sup> (total issuance) <sup>2)</sup>
Euro	37.0	37.9	35.0	33.7	38.0	38.3	34.4	36.2 (879.3)
US dollar	39.6	36.5	39.2	40.2	36.5	37.9	40.5	38.5 (935.4)
Japanese yen	2.1	3.2	1.9	1.5	1.6	1.7	1.8	2.0 (46.9)
Total (incl. other currencies)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0 (2,427.9)

Sources: BIS and ECB calculations.

Notes: Shares at current exchange rates.

1) Average quarterly percentage.

2) Amounts in USD billions.

yen's share in gross issues of international money market instruments levelled off at around 2% (see Table 2).

In the long-term segment, the euro share in international issuance of bonds and notes declined by more than 7 percentage points compared with the previous review period to less than 28% on average, even though the issuance of euro-denominated bonds and notes in absolute amounts has been rising. Between June 2005 and December 2006, a total of around USD 830 billion worth of euro-denominated international bonds and notes were issued, corresponding to a quarterly average of almost USD 140 billion, which is around 10% above the average for the previous review period. Thus, the fall in the euro share has been the result of strong issuance activity in US dollars. Between June 2005 and December 2006, non-US residents issued almost USD 1.5 trillion worth of US dollar-denominated international bonds and notes, corresponding to a quarterly

average of USD 240 billion, an increase of 70% compared with the average in the previous review period. As a result, the US dollar share in the issuance of international bonds and notes climbed to an average of 48% compared with around 40% in the previous review period (see Table 3).<sup>7</sup>

The majority of euro-denominated bonds and notes have been issued by the non-euro area

<sup>7</sup> Few empirical studies have analysed the determinants of currency choice of international bond issuance on an aggregate level. ("Determinants of the currency choice of international bond issuance by firms" was the subject of the special focus chapter in the 2004 Review of the international role of the euro.) A recent exception is Cohen (2005), who finds that aggregate issuance of international bonds is significantly higher in a currency when its exchange rate is at an elevated level relative to historical averages and when long-term interest rates in that currency are high relative to those available in other major currencies. In the review period, the two factors provided contradictory signals for the use of the euro as a currency of denomination, as the euro has been trading at elevated levels relative to historical averages, while long-term euro interest rates have been lower than long-term US dollar rates.

**Table 3 Major currencies' shares in gross issuance of long-term international debt securities**

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

	Pro memoria: 2004 Q3-2005 Q2 <sup>1)</sup>	2005 Q3	2005 Q4	2006 Q1	2006 Q2	2006 Q3	2006 Q4	2005 Q3-2006 Q4 <sup>1)</sup> (total issuance) <sup>2)</sup>
Euro	35.2	30.0	25.0	28.6	27.1	27.7	27.4	27.6 (832.7)
US dollar	39.7	42.6	48.9	44.2	49.9	51.5	50.5	47.9 (1,457.0)
Japanese yen	6.3	7.1	5.3	4.3	4.0	3.9	4.5	4.9 (143.2)
Total (incl. other currencies)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0 (3,018.1)

Sources: BIS and ECB calculations.

Notes: Shares at current exchange rates.

1) Average quarterly percentage.

2) Amounts in USD billions.

private sector, in particular, by the non-euro area financial sector. As at December 2006, the private sector accounted for more than 80% of the total USD 2.3 billion outstanding issues in euro (see Chart 2). Over the review period, the share of private sector issuances increased by almost 4 percentage points, owing to an increase in the share of private banks and financial institutions from 60% to 67% of total issuances, while the corresponding share of private corporate issuers decreased from 17% to less than 14%. The dominance of the private banking and financial sector in the issuance of international bonds and notes is a common feature across other major currencies, such as the US dollar and the Japanese yen, where it accounts for around 50% of total issuances. However, in the case of the euro, this trend is more accentuated.

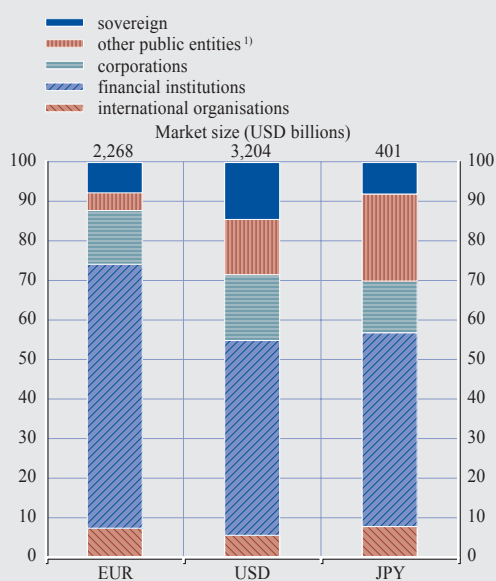
The share of sovereign issuances in international euro-denominated debt is relatively small and declining. As at December 2006, sovereign issuances accounted for less than 8% of total

outstanding euro-denominated issuances, a drop of 1 percentage point over the review period and of around 10 percentage points since the start of EMU in 1999. A closer look at the temporal pattern of the outstanding volume of euro-denominated international bonds and notes by sector reveals that this trend is the result of the levelling off of outstanding sovereign issuances in euro at around USD 170 billion over the past two years. By contrast, euro issuances by the private financial sector increased by around 50% from around USD 1 trillion over the previous period to USD 1.5 trillion as at the end of 2006 (see Chart 3). International organisations and other public institutions accounted for around 7% and 5% of the total stock of euro-denominated international bonds, respectively, at end of 2006 (see Chart 2).

Investment banks based in the United States (for example Morgan Stanley, Citigroup and Goldman Sachs) and financial institutions

**Chart 2 Outstanding volume of international bonds and notes by sector**

(percentages, fourth quarter of 2006)

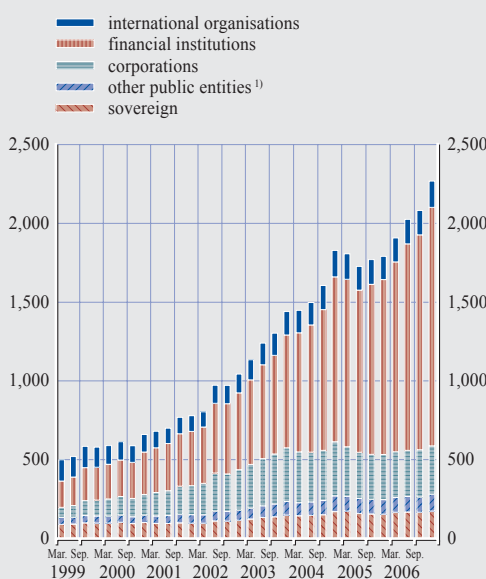


Sources: BIS and ECB calculations.

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

**Chart 3 Outstanding volume of euro-denominated international bonds and notes by sector**

(USD billions)



Sources: BIS and ECB calculations.

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

**Table 4 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	
Morgan Stanley	(14,575)	Kreditanstalt für Wiederaufbau – KfW	(18,811)
HBOS Treasury Services plc	(10,775)	European Investment Bank – EIB	(17,128)
Credit Agricole SA (London)	(10,512)	Landwirtschaftliche Rentenbank	(10,424)
Alpha Credit Group plc	(8,859)	Federative Republic of Brazil	(8,205)
Citigroup Inc	(8,850)	Telecom Italia Capital	(6,912)
Goldman Sachs Group Inc	(8,500)	Commonwealth Bank of Australia	(6,372)
DnB NOR Bank ASA	(8,060)	Arran Residential Mortgages Funding No 2 plc	(5,473)
Danske Bank A/S	(7,402)	Republic of Turkey	(5,072)
Spintab AB	(7,350)	Vodafone Group plc	(4,948)
HSBC Finance Corp	(6,350)	Granite Master Issuer plc Series 2006-3	(4,777)
Northern Rock plc	(6,325)	Rabobank Nederland	(4,729)
DaimlerChrysler North America Holding Corp	(6,050)	Royal Bank of Scotland plc	(4,725)
Lehman Brothers Holdings Inc	(5,625)	Siemens Financieringsmaatschappij NV	(4,710)
Merrill Lynch & Co Inc	(5,058)	Gracechurch Mortgage Financing 2006-1	(4,530)
Bank of America Corp	(5,000)	Arkle Master Issue Plc 2006-1	(4,441)
Swedbank (ForeningsSparbanken AB)	(4,960)	Caisse d'Amortissement De La Dette Sociale – CADES	(4,337)
Vodafone Group plc	(4,700)	Bank Nederlandse Gemeenten NV – BNG	(4,081)
Bradford & Bingley plc	(4,450)	Telefonica Emisiones SAU	(4,060)
Svenska Handelsbanken AB	(4,340)	Republic of Italy	(4,024)
Nationwide Building Society	(4,300)	Vale Overseas Ltd	(4,000)
Memo item:			
European Investment Bank	(23,769)		

Sources: Dealogic Bondware and ECB calculations.

Note: The EIB is included in this list as a memo item as it is also included in the BIS data reported in Tables 1 to 3.

based in the United Kingdom (such as HBOS Treasury Services, Credit Agricole SA, Alpha Credit Group plc, HSBC Finance Corp and Northern Rock) and in the Nordic countries (for instance DnB NOR Bank, Danske Bank and Spintab AB) were among the largest non-euro area issuers of euro-denominated bonds (see Table 4). It is interesting to note that the first ten issuers are all financial corporations and that, among the first twenty issuers, there are only two non-financial corporations (DaimlerChrysler North America and Vodafone Group) and no sovereign issuers. Among the top 50 non-euro area issuers of euro-denominated bonds, the only sovereign is the Republic of Poland, which issued bonds for a total of €3.5 billion over the review period.

A similar ranking of the non-US issuers of US dollar-denominated bonds shows a different picture. Financial institutions are still at the top of the ranking, but they are not from the private

sector. Two German public sector banks (KfW and Rentenbank) and the European Investment Bank are by far the three largest issuers of US dollar-denominated bonds and notes over the review period. In addition, three sovereign issuers (Brazil, Turkey and Italy) are among the top 20 US dollar issuers.

### 1.3 EVIDENCE AVAILABLE ON DEMAND TRENDS

#### EVIDENCE FROM FUNDS UNDER MANAGEMENT

The euro share in the holdings of debt securities managed by a number of mutual funds, pension funds and insurance companies in North America (the United States and Canada) remains negligible. Evidence from data on bond portfolios surveyed in the eMaxx database by Lipper, a financial information provider, suggests that the euro's share in North America remained at around 0.7% of bonds under management (see Table 5).<sup>8</sup> In absolute terms,

<sup>8</sup> The evidence presented on demand trends may to some extent reflect valuation effects.

**Table 5 Breakdown by currency of funds under management according to the eMaxx database**

(based on most recent data; end-of-period percentages)

	Euro	US dollar	Japanese yen	Others
<b>Funds under management in the United States and Canada</b>				
December 1999	0.2	97.0	0.8	2.0
December 2000	0.3	97.8	0.8	1.1
December 2001	0.4	97.1	0.8	1.7
December 2002	0.4	97.4	0.7	1.5
December 2003	0.6	97.3	0.7	1.4
December 2004	0.5	96.9	0.9	1.6
June 2005	0.7	97.3	0.8	1.2
December 2005	0.7	97.0	0.7	1.6
June 2006	0.6	97.0	1.0	1.5
December 2006	0.7	97.1	0.8	1.4
<b>Funds under management in non-euro area Europe<sup>1)</sup></b>				
December 1999	15.9	26.8	0.7	56.6
December 2000	25.3	23.0	1.4	50.3
December 2001	30.8	17.3	2.9	49.1
December 2002	35.5	21.1	3.0	40.3
December 2003	33.8	18.9	3.1	44.2
December 2004	28.2	15.9	2.3	53.6
June 2005	26.2	23.6	2.9	47.3
December 2005	29.9	23.2	2.6	44.3
June 2006	35.9	14.0	2.6	47.5
December 2006	27.8	14.4	2.2	55.6

Sources: Lipper, a Reuters company, and ECB calculations. Data may be subject to revisions.

1) Denmark, Liechtenstein, Monaco, Norway, Sweden, Switzerland and the United Kingdom.

surveyed bond holdings in euro in North America only amounted to USD 34 billion in December 2006, the same level as at June 2005. It is important to note that the above-mentioned euro share does not refer and cannot be compared to the narrow measure of the international bond market used in the previous sections, since data refer to the currency breakdown irrespective of the residence of the issuer. In particular, data for North American holdings of debt securities include US dollar-denominated securities issued by residents in North America. In addition, as stressed in previous reviews, market participants suggest that US-based investors mostly manage their portfolios invested in euro from the City of London.

The euro share in the portfolios of funds in non-euro area Europe increased to almost 28%, from about 26% in June 2005. In contrast, the US dollar share in the same portfolios fell to 14% at the end of 2006, its lowest level since 1999.

In absolute terms, the reported total (all currencies) holdings of funds in non-euro area Europe more than doubled, rising from USD 150 billion in June 2005 to almost USD 400 billion in December 2006. Interestingly, the bulk of this accumulation has taken place in debt securities denominated in currencies other than the euro, the US dollar or the Japanese yen. Given the limited coverage of the eMaxx database, inferences from these data should be treated with some caution.<sup>9</sup>

#### EVIDENCE FROM INTERNATIONAL PORTFOLIO INVESTMENT POSITIONS

Data from surveys of the international investment position – the stock of foreign assets

<sup>9</sup> The eMaxx database reports holdings of debt securities managed by a number of mutual funds, pension funds and insurance companies. These holdings are available on a security-by-security basis. The geographical coverage is mainly focused on the United States, Canada and Europe and the degree of coverage of portfolios may not necessarily be the same over time. Data refer to euro-denominated bonds issued by non-euro area residents and euro area residents alike.

**Table 6 Euro area portfolio investment position – debt securities by instrument and currency of issue**

	Assets						Liabilities					
	Total		Bonds and notes		Money market instruments		Total		Bonds and notes		Money market instruments	
	Total	of which in euro	Total	of which in euro	Total	of which in euro	Total	of which in euro	Total	of which in euro	Total	of which in euro
<i>EUR billions</i>												
end-2004	1,783	957	1,496	847	287	111	2,281	1,590	2,045	1,447	235	143
end-2005	2,141	1,062	1,826	963	315	99	2,594	1,710	2,276	1,511	318	199
<i>As a percentage of the total</i>												
end-2004	100.0	53.7	83.9	56.6	16.1	38.5	100.0	69.7	89.7	70.7	10.3	61.0
end-2005	100.0	49.6	85.3	52.7	14.7	31.5	100.0	65.9	87.8	66.4	12.2	62.7

Source: ECB.

and liabilities of a country – offer an opportunity to monitor the relative importance of the euro in the portfolio of euro area residents and non-euro area residents. As regards euro area residents, since the last review, the Eurosystem has started collecting data on the currency composition of the euro area's portfolio investment<sup>10</sup>. As regards non-euro area residents, starting from this review, this section presents publicly available data from the Coordinated Portfolio Investment Survey (CPIS) of the IMF, which reports the currency composition of foreign portfolio investment assets in selected countries.

At the end of 2005, the total value of euro-denominated debt securities issued by non-residents and held by euro area residents was more than €1 trillion, accounting for about one half of total foreign assets of the euro area. This share dropped by around 4 percentage points with respect to end-2004 (see Table 6, left panel). This decline does not necessarily indicate a fading appetite for euro-denominated assets issued abroad, but may largely reflect valuation effects, as figures are reported at market value. Price and exchange rate movements can modify the relative share of the various currencies in the portfolio of foreign assets and liabilities<sup>11</sup>. Looking at the various instruments, bonds and notes issued abroad represent the bulk of total debt securities, with more than half of these long-term securities denominated in euro. By contrast, the euro share in foreign money market instruments held

by euro area residents is much smaller and equal to 31% at the end of 2005.

At the end of 2005, the total value of euro-denominated liabilities (debt securities) issued by euro area residents and held by non-euro area residents was around €1.7 trillion, representing around two thirds of total foreign liabilities of the euro area. Similarly to the case of foreign assets, this share declined by around 4 percentage points with respect to the end of 2004 (see Table 6, right panel)<sup>12</sup>. In contrast to the asset side, the euro share in total bonds and notes issued by euro area residents and held abroad, 66% at the end of 2005, is similar to the euro share in total money market instruments issued by euro area residents and held abroad, which stood at 63% at the end of 2005.

Data on the euro share in holdings of foreign assets held as debt securities by non-euro area residents, collected within the IMF's CPIS for end-2005 (see Table 7), reveal the familiar

10 Data on the currency composition of portfolio investment cover only debt securities, including bonds, notes and market instruments.

11 In this particular case, for instance, the decline of the euro share is mainly due to large valuation gains in the foreign currency holdings of the euro area, largely due to the depreciation of the euro in 2005, which have increased the stock of foreign currency denominated debt securities relative to euro-denominated debt securities.

12 The decline was the combined result of three different factors: (i) reduced issuance of euro-denominated debt securities by euro area residents; (ii) an increase in the value of the stock of foreign currency denominated liabilities, mainly owing to the depreciation of the euro in 2005, and (iii) a decrease in the value of the stock of euro-denominated liabilities.

**Table 7 Currency breakdown of portfolio investment assets held in debt securities at the end of 2005**

(excluding euro area countries, ranked by region and size of total assets)

	US dollar million					Percentage of total debt securities				
	US dollars	Euro	Yen	Other	Total	US dollars	Euro	Yen	Other	Total
<b>Non-euro area EU</b>										
Denmark	30,721	58,884	236	18,316	108,158	28	54	0	17	100
Sweden	29,261	48,461	1,392	18,883	97,997	30	49	1	19	100
Cyprus	5,390	4,543	138	1,200	11,271	48	40	1	11	100
Poland	3,288	1,595	0	2,215	7,098	46	22	0	31	100
Bulgaria	375	365	0	28	768	49	48	0	4	100
Hungary	396	277	10	77	759	52	36	1	10	100
Romania	1	549	0	0	550	0	100	0	0	100
<b>Other EU neighbouring countries</b>										
Switzerland	74,082	143,113	5,373	147,129	369,696	20	39	1	40	100
Israel	13,513	2,424	20	2,076	18,033	75	13	0	12	100
Russia	16,125	717	0	593	17,435	92	4	0	3	100
Ukraine	1	4	0	0	5	16	83	0	1	100
<b>America</b>										
United States	1,011,013	120,786	22,169	119,449	1,273,417	79	9	2	9	100
The Bahamas	19,738	0	0	0	19,738	100	0	0	0	100
Mexico	5,323	195	0	148	5,665	94	3	0	3	100
Colombia	4,105	45	0	480	4,630	89	1	0	10	100
Venezuela	2,497	14	0	764	3,276	76	0	0	23	100
Uruguay	1,733	47	0	6	1,786	97	3	0	0	100
Costa Rica	820	14	0	0	833	98	2	0	0	100
<b>Asia</b>										
Japan	756,350	336,985	448,441	164,539	1,706,315	44	20	26	10	100
Korea, Republic of	26,764	2,246	480	262	29,751	90	8	2	1	100
Malaysia	2,018	57	10	146	2,231	90	3	0	7	100
Thailand	1,686	152	34	19	1,891	89	8	2	1	100
Indonesia	714	3	0	359	1,075	66	0	0	33	100
India	8	0	0	37	45	17	0	0	83	100
Pakistan	0	2	0	5	7	0	32	0	68	100

Sources: IMF (Coordinated Portfolio Investment Survey, CPIS) and ECB calculations.

geographical pattern of the international role of the euro.<sup>13</sup> In most non-euro area EU countries for which CPIS data is available, the euro share stood at around 40%-50%. Exceptions were Poland (22%) and Romania (100%). In other countries neighbouring the EU for which such data are available, Ukrainian residents hold a sizable fraction of their foreign assets in euro-denominated debt instruments (more than 80%), followed by Swiss residents (almost 40%). Residents of Israel and Russia, on the other hand, hold a large proportion of their foreign assets in US dollar-denominated debt instruments.

In the United States and Latin American countries for which such data are available, the US dollar is the main currency of denomination of foreign debt securities. In particular, US

residents held only 9% of their foreign debt securities in euro-denominated assets. With regard to Asian countries, Japan stands out as the only country holding significant amounts of euro-denominated debt securities. In fact, at the end of 2005, 20% of Japanese foreign debt securities were held in euro-denominated instruments.

13 It should be noted that the total outstanding volume of portfolio investment assets held in debt securities varies substantially among the countries reporting a breakdown of currencies, with the United States (USD 1,273 billion) and Ukraine (USD 5 million) at the opposite extremes. Moreover, the importance of portfolio investment assets held in debt securities differs by country as some countries also hold considerable amounts in equities.

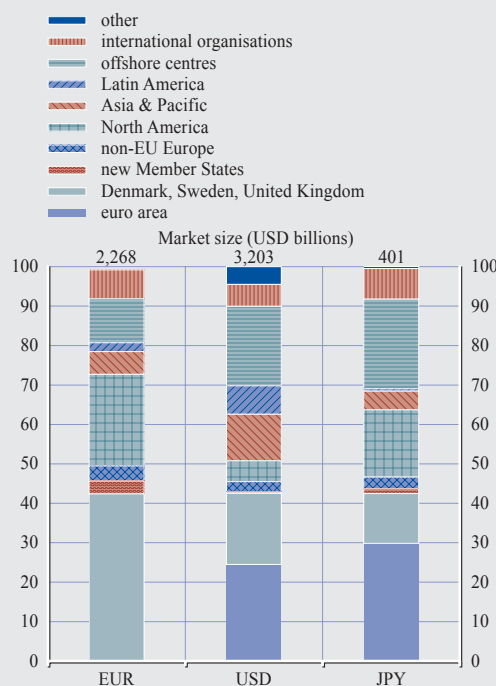
#### 1.4 STOCKS OF INTERNATIONAL DEBT SECURITIES, BROKEN DOWN BY CURRENCY AND REGION

This detailed stocktaking exercise gives an overview of the currency composition of the stock of international debt securities (according to the narrow measure, measured at constant exchange rates), broken down into the regions in which the issuers reside (see Table 8 and Chart 4).<sup>14</sup> In line with previous findings, European entities remain the largest issuers of international debt securities, accounting for USD 3.5 trillion, or around 49%, of the total stock of international debt securities in the fourth quarter of 2006. Compared with the end of the last review period, this constitutes an increase of about 2 percentage points. Outside Europe, issuance by entities resident in offshore centres, by US residents and by international organisations continue to account for the second, third and fourth largest stock of issues respectively.

As reported in sub-section 1.1, euro-denominated international issues accounted for more than 31% of the total stock of international issues at the end of 2006. The largest stock of international debt securities in euro continues to be accounted for by Denmark, Sweden and the United Kingdom, which together issue around 42% of total euro-denominated issuances. Compared with the second quarter of 2005, the euro share in the combined stock of international debt securities issued by residents in those three countries declined by 2.5 percentage points to about 57%. The euro share in the stock of international debt securities also dropped in the offshore centres (down 11 percentage points) and the United States (down 3 percentage points), which together account for around one third of total euro-denominated issuances. As far as other regions are concerned, the euro share remained stable or declined in almost all other regions, with the exception of Africa, where it increased by more than 6 percentage points.

Chart 4 Outstanding volume of international bonds and notes by region

(percentages, fourth quarter of 2006)



Sources: BIS and ECB calculations.

The breakdown by region of the issuance of international debt securities sheds further light on the decline in the euro share vis-à-vis the US dollar share during the review period (see sub-section 1.1). As already mentioned, this decline was largely caused by strong issuance activity in US dollars. Table 8 reveals that the rise in the outstanding amount of international debt securities is accounted for by issuances in Europe and offshore financial centres, where US dollar issuances usually dominate euro issuances. Between June 2005 and December 2006, the total outstanding amount of international debt securities increased by USD 1,650 billion (at constant exchange rates). More than half of this amount (around USD 900 billion) was issued by residents in Europe, where US dollar issuances are larger than euro issuances as euro issuance by euro area residents

<sup>14</sup> It is worth noting that the total figures reported in the last row of Table 8 correspond to those shown in Chart 1.

**Table 8 Currencies' shares in the stock of outstanding international debt securities in selected regions**

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

	Total amount outstanding		of which denominated in:							
			All currencies (USD billions)		US dollars		Euro		Japanese yen	
	2006 Q4	2005 Q2	(%)	(% point change) vis-à-vis	(%)	(% point change) vis-à-vis	(%)	(% point change) vis-à-vis	(%)	(% point change) vis-à-vis
			2006 Q4	2005 Q2	2006 Q4	2005 Q2	2006 Q4	2005 Q2	2006 Q4	2005 Q2
Africa	22	22	57.6	-3.6	35.3	6.4	6.8	-2.2	0.3	-0.6
Asia and Pacific	591	482	64.0	0.5	22.1	0.6	3.2	-0.8	10.7	-0.3
<i>of which:</i>										
Japan	65	58	50.0	-4.0	39.8	0.8	...	...	10.2	3.2
Europe	3,545	2,648	41.8	1.6	31.4	-1.6	5.3	-1.2	21.5	1.2
<i>of which:</i>										
Euro area	1,524	1,119	51.5	1.0	...	...	7.9	-2.3	40.6	1.2
Denmark, Sweden, United Kingdom	1,695	1,278	34.1	2.3	56.8	-2.4	3.0	-0.6	6.1	0.7
New Member States	88	72	10.3	-1.5	77.7	0.1	5.5	1.2	6.4	0.3
Non-EU developed Europe <sup>1)</sup>	167	113	31.8	5.1	41.6	-3.2	6.7	-0.4	19.8	-1.5
Non-EU developing Europe	72	66	77.9	-2.0	19.5	0.9	1.1	-0.4	1.5	1.5
International organisations	575	548	30.9	-1.8	28.9	-1.0	5.4	-0.4	34.8	3.3
Latin America	288	290	80.4	2.2	17.7	-1.6	0.8	-0.6	1.1	0.0
Middle East	102	58	80.1	2.6	16.8	-4.4	0.4	-0.6	2.8	2.5
North America	1,006	800	16.9	-3.8	52.4	0.4	6.8	-0.7	24.0	4.1
<i>of which:</i>										
Canada	244	230	69.6	-2.2	14.6	0.8	3.4	-0.7	12.5	2.1
United States	762	570	...	...	64.5	-3.0	7.9	-1.0	27.6	4.0
Offshore centres	1,101	734	61.0	17.9	23.0	-10.6	8.3	-4.8	7.8	-2.5
<b>Total</b>	<b>7,231</b>	<b>5,581</b>	<b>44.3</b>	<b>2.8</b>	<b>31.4</b>	<b>-2.3</b>	<b>5.5</b>	<b>-1.3</b>	<b>18.8</b>	<b>0.8</b>

Sources: BIS and ECB calculations.

Note: All figures are expressed at 2006 Q4 exchange rates.

1) Iceland, Norway, Switzerland and European microstates.

are excluded in line with the narrow definition of an international currency. Almost another quarter of the change in the total stock (about USD 370 billion) was issued by residents in the offshore financial centres, where US dollar-denominated issuances reached 61% of the total stock.

in the issuance of US dollar-denominated international debt securities in Europe and offshore financial centres.

Overall, the breakdown by region continues to provide further evidence for the geographical pattern of the international role of the euro, which can also be found in other market segments and in the use of the euro by third countries: the internationalisation of the single currency is still strongly focused on the euro area's neighbouring regions, in particular non-euro area EU Member States, and mature market economies. The decline in the euro share over the review period reflects the strong acceleration



## 2 THE EURO IN INTERNATIONAL LOAN AND DEPOSIT MARKETS

Over the review period, the euro share declined in both the international loan and international deposit markets, by almost 1.5 percentage points and by about 3 percentage points, respectively. In the fourth quarter of 2006, according to the narrow measure, i.e. cross-border transactions denominated in a currency which is neither the home currency of the borrower nor that of the lender, the euro share was equal to around 17% in the international loan markets and 18% in the international deposit markets. Geographical trends reveal that developing Europe is playing a growing role in attracting euro-denominated loans.

This section describes developments in the use of the euro by non-euro area residents in international loan and deposit markets. The data presented exclude interbank activity, given that the currency choice in interbank markets may reflect other factors than those corresponding to loans to/deposits by non-bank borrowers/depositors. The role of the euro is compared at three different levels, namely activity between euro area banks and non-bank agents outside the euro area, activity between euro area non-banks and banks outside the euro area and activity entirely outside the euro area between banks and non-bank agents (see Chart 6). For both loans and deposits, data for the currency composition as at the fourth quarter of 2006 is presented for all three levels of activity. In addition, we present a “narrow” aggregate for both loans and deposits, which only includes cross-border transactions denominated in a currency which is neither the

home currency of the borrower nor that of the lender. Finally, an update on the use of the euro as the currency of denomination of bank deposits in BIS-reporting banks by oil-exporting countries is analysed in Box 2.

### 2.1 THE ROLE OF THE EURO IN INTERNATIONAL LOAN MARKETS

The euro share in international loan markets declined by almost 1.5 percentage points to 19.8% in December 2006 from 21.2% in March 2005 (latest review), measured at constant 2006 Q4 exchange rates. The euro share declined across the three levels of activity, whether or not euro area residents were involved in the transactions, with the largest decrease – by more than 3 percentage points – in loans by euro banks to borrowers outside the euro area. According to the narrow measure – i.e. cross-border transactions excluding the domestic

**Table 9 The euro share in international loan markets**

(as a percentage of the total amount outstanding and at constant exchange rates)

	All cross-border loans <sup>1)</sup>	(A) Loans by euro area banks to borrowers outside the euro area	(B) Loans by non-euro area banks to borrowers in the euro area	(C) Loans by banks outside the euro area to borrowers outside the euro area <sup>2)</sup>	Loans by banks outside the euro area to borrowers outside the euro area <sup>3)</sup>
Mar. 2002	20.8	38.5	50.3	6.0	14.8
Mar. 2003	21.5	40.0	52.8	7.4	19.4
Mar. 2004	21.2	40.1	52.9	5.7	15.9
Mar. 2005	21.2	39.6	56.6	7.0	20.2
Mar. 2006	21.1	37.5	53.4	7.8	20.1
Dec. 2006	19.8	36.3	54.2	6.3	16.7

Sources: BIS and ECB calculations.

Note: Excluding interbank loans and deposits.

1) Weighted average of column (A) (B) and (C)

2) Including loans to/from Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

3) Excluding loans to/from Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

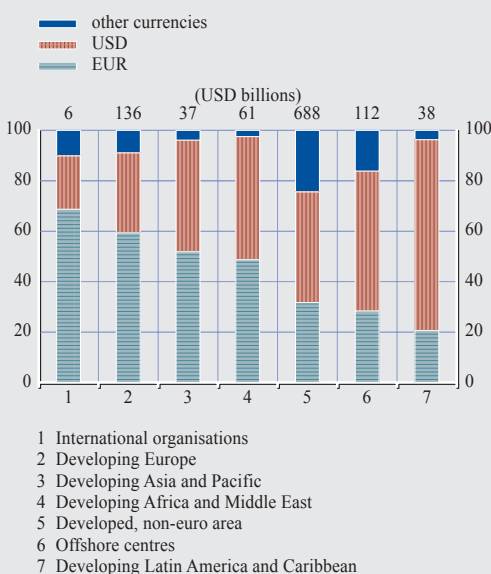
currency of the borrower or the lender – the euro share was equal to 16.7% in the fourth quarter of 2006, falling by 3.5 percentage points with respect to the first quarter of 2005 (see Table 9).

On a disaggregated level – at current exchange rates – the total stock of loans granted by euro area banks to non-bank borrowers outside the euro area amounted to around USD 1.1 trillion in the fourth quarter of 2006, of which more than 36% is accounted for by euro-denominated loans (see Chart 6a), upper panel, left diagram).<sup>15</sup> The regional destination of loans reveals similar patterns to that observed in the case of international debt securities and that developing Europe<sup>16</sup> is playing a growing role in attracting euro-denominated loans (see Chart 5). Non-bank entities in developed countries outside the euro area constitute the main borrowers from euro area banks, with an outstanding amount of USD 688 billion in the fourth quarter of 2006, around 64% of such loans.<sup>17</sup> For these borrowers, the euro share in the denomination of loans granted by euro area banks declined to 32% in the fourth quarter of 2006 from 37% in the first quarter of 2005.

Recent trends confirm the increasingly dominant role of the euro on a regional basis. Loans by euro area banks to developing Europe rose by around 50% over the review period to USD 136 billion in the fourth quarter of 2006.<sup>18</sup> Over the same period, euro-denominated loans to developing Europe increased by around 100% and, as a result, the euro share in total loans increased by 8 percentage points to 59% in the fourth quarter of 2006. In other emerging market countries, in line with the evidence presented in the last review, the euro remains the main currency of denomination of loans granted by euro area banks to non-bank borrowers in Africa and the Middle East, as well as Asia and the Pacific, with a share of around 50% in the fourth quarter of 2006. By contrast, lending by euro area banks to Latin America and the Caribbean, as well as to offshore centres takes place mainly in US dollars.

**Chart 5 Loans made by euro area banks to non-bank borrowers outside the euro area: currency shares by region**

(as a percentage of the total amount outstanding by region in 2006 Q4)



Sources: BIS and ECB calculations.

During the review period, loans made by non-euro area banks to non-bank borrowers in the euro area continued to be predominantly denominated in euro. In the fourth quarter of 2006 – at current exchange rates – the euro’s share stood at more than 54% while loans denominated in US dollars accounted for almost 28% of the total amount of loans outstanding. Other currencies, including the Japanese yen, had a combined share of 18% (see Chart 6a), upper panel, right diagram). The largest non-euro area lenders to non-bank borrowers in the euro area are UK banks, which accounted for more than a half of the USD 590 billion

15 Throughout this section, BIS data are used since they are available by currency with a breakdown of the destinations of loans and deposits.

16 This definition follows the terminology and classification of the BIS.

17 According to the BIS classification, developed countries include (in addition to euro area countries) Andorra, Australia, Canada, Denmark, Iceland, Japan, Liechtenstein, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, the United States and the Vatican City.

18 See also the Special Focus in this Review on “Asset substitution in central, eastern, and south-eastern Europe: trends and determinants”.

outstanding loans in the fourth quarter of 2006, followed by banks in the United States, Japan and offshore centres.

With regard to loans made outside the euro area by banks to non-banks, the euro accounts for around 6% of total lending entirely outside the euro area (USD 2.8 trillion in 2006 Q4). Extra euro-area cross-border lending – in all currencies – is largely driven by UK banks and offshore financial centres, together accounting for two thirds of total lending, and mainly denominated in US dollar (70% in 2006 Q4). However, adopting the narrow measure and focusing only on cross-border transactions denominated in a currency which is neither the home currency of the borrower nor that of the lender – e.g. excluding US dollar borrowing by US non-banks or US dollar lending by US banks – the euro share is almost 17% – at current exchange rates as at the fourth quarter of 2006 – and the US dollar share decreases to 50% (see Chart 6a), upper panel, lower diagrams).

## 2.2 THE ROLE OF THE EURO IN INTERNATIONAL DEPOSIT MARKETS

The euro share in international deposit markets fell by almost 3 percentage points to 21.6% in December 2006 from 24.5% in March 2005

(latest review), measured at constant 2006 Q4 exchange rates. Similar to international loans, the euro share fell across the three levels of activity, whether or not euro area residents were involved in the transactions, with the largest decrease – by almost 6 percentage points – in deposits in euro area banks by depositors outside the euro area. According to the narrow measure – i.e. cross-border transactions excluding the domestic currency of the borrower or the lender – the euro share was equal to 18.0% in the fourth quarter of 2006, falling by 3.3 percentage points with respect to the first quarter of 2005 (see Table 10).

On a disaggregated level – at current exchange rates – the stock of deposits in euro area banks made by non-banks outside the euro area amounted to around USD 1.1 trillion in the fourth quarter of 2006 (see Chart 6b), upper panel, left diagram). The euro is the most widely used currency of denomination for deposits by non-euro area non-banks with banks in the euro area, accounting for about USD 530 billion or almost 47% of the total deposits in the fourth quarter of 2006. Of the total stock of such deposits, around 65% or USD 730 billion were held by residents of developed countries other than those in the euro area. From a geographical perspective, and in line with previous findings,

**Table 10 The euro share in international deposits markets**

(as a percentage of the total amount outstanding and at constant exchange rates)

	All cross-border deposits <sup>1)</sup>	(A) Deposits in euro area banks by depositors outside the euro area	(B) Deposits in banks outside the euro area by euro area depositors	(C) Deposits by depositors outside the euro area in banks outside the euro area <sup>2)</sup>	Deposits by depositors outside the euro area in banks outside the euro area <sup>3)</sup>
Mar. 2002	25.5	49.2	57.2	9.4	17.8
Mar. 2003	26.0	53.2	57.3	9.8	20.8
Mar. 2004	24.9	53.0	56.3	8.5	19.0
Mar. 2005	24.5	52.5	53.8	9.4	21.3
Mar. 2006	22.9	50.6	49.0	9.2	19.8
Dec. 2006	21.6	46.7	49.9	8.7	18.0

Sources: BIS and ECB calculations.

Note: Excluding interbank loans and deposits.

1) Weighted average of column (A) (B) and (C)

2) Including deposits in/of Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

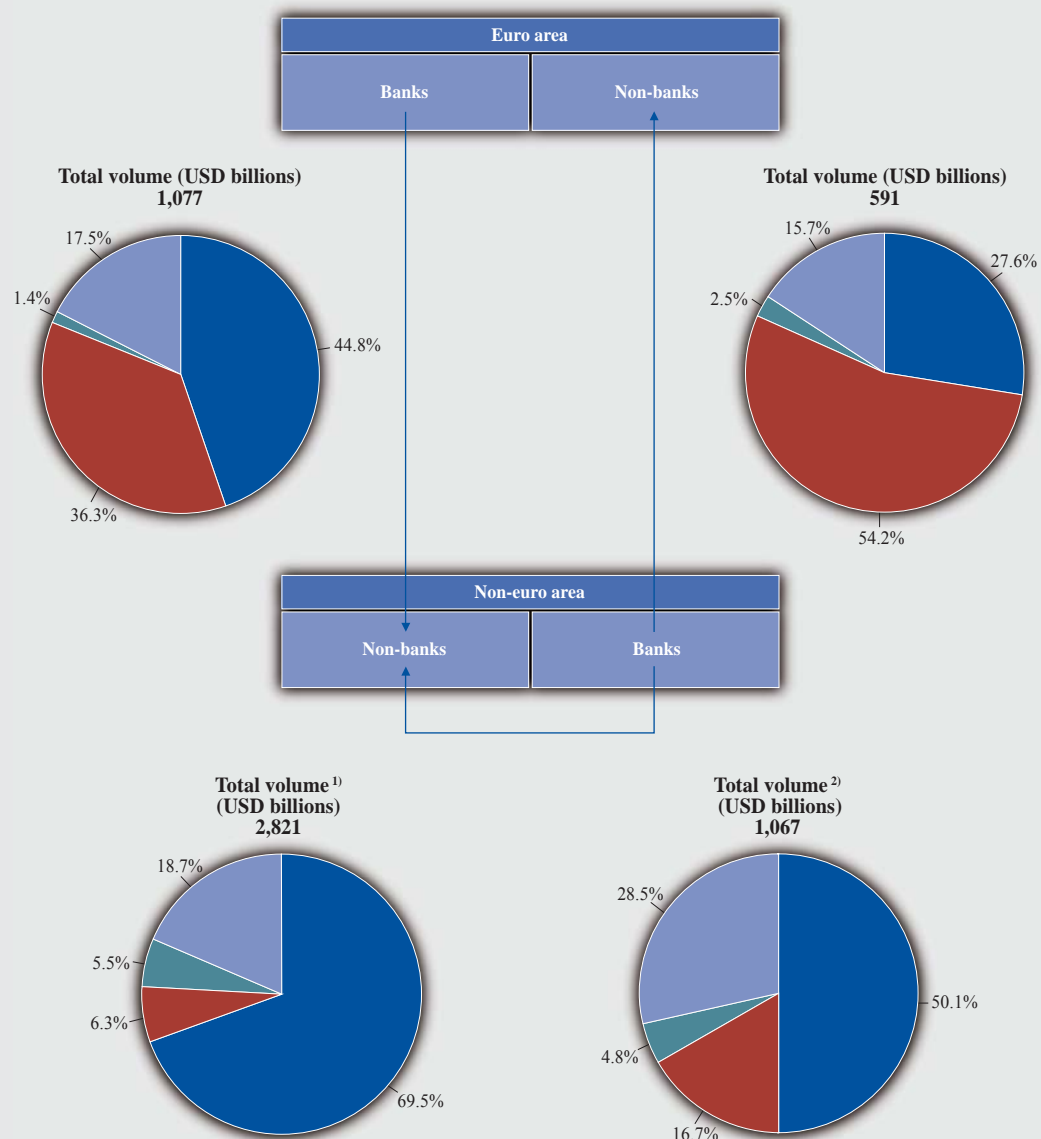
3) Excluding deposits in/of Japan, Switzerland, the United Kingdom and the United States in their domestic currency.

Chart 6a)

(fourth quarter of 2006)

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

- US dollar
- euro
- Japanese yen
- other currencies



Source: BIS and ECB calculations.

Note: Excluding interbank loans.

1) Including loans to/from Japan, Switzerland, the United Kingdom and the United States in domestic currency.

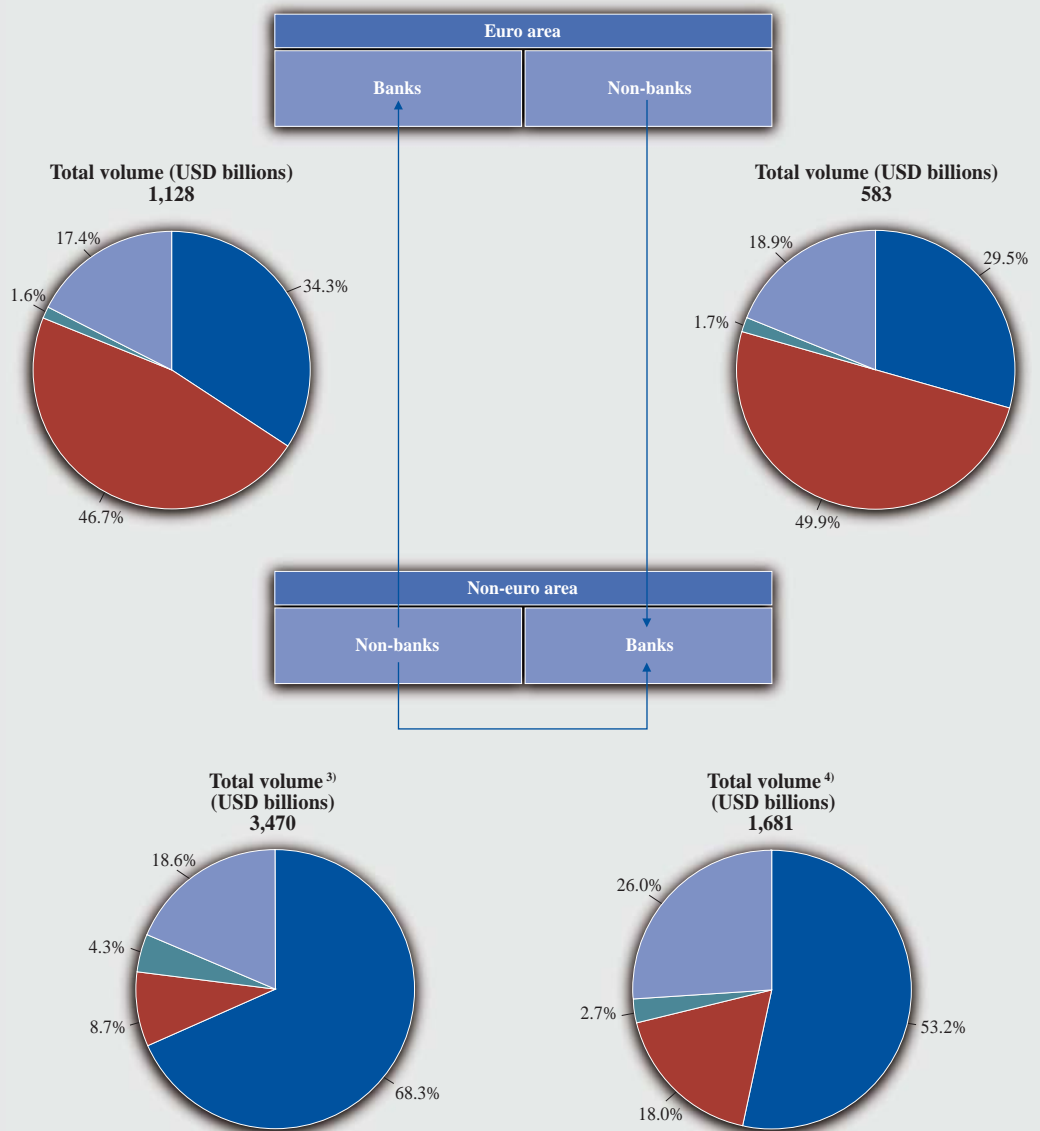
2) Excluding loans to/from Japan, Switzerland, the United Kingdom and the United States in domestic currency.

Chart 6b)

(fourth quarter of 2006)

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

- US dollar
- euro
- Japanese yen
- other currencies



Source: BIS and ECB calculations.  
 Note: Excluding interbank deposits.

3) Including deposits in/of Japan, Switzerland, the United Kingdom and the United States in domestic currency.

4) Excluding deposits in/of Japan, Switzerland, the United Kingdom and the United States in domestic currency.

the largest share of deposits was held by residents in the United Kingdom, accounting for more than one third of all deposits by non-euro area non-banks with euro area banks in the fourth quarter of 2006, followed by those in the United States and in offshore financial centres, each accounting for around one-fifth of all deposits by non-euro area non-banks. Looking at euro-denominated deposits only, the largest share was also held by residents in the United Kingdom, which accounted for 47% of euro-denominated deposits held with euro area banks by non-euro area non-banks in the fourth quarter of 2006. Residents in offshore financial centres accounted for around 17% of such deposits, with a share that decreased by 1 percentage point over the review period.<sup>19</sup> By contrast, the share of US entities in such deposits remained stable at around 9%.

The total stock of deposits of euro area non-banks in banks outside the euro area amounted to USD 583 billion in the fourth quarter of 2006. Of this amount, almost 50% were denominated in euro (see Chart 6b), upper panel, right diagram). About 57% of all deposits by euro area non-banks and held in banks outside the euro area are held with UK banks. When considering only deposits denominated in euro, the share held by the UK banks increases to 75%.

As in the case of the international loan markets, when focusing on cross-border deposits by non-bank depositors outside the euro area in banks residing outside the euro area, the euro share is smaller than in transactions where euro area agents are involved. The total stock of deposits held by non-euro area non-banks in banks

outside their home country, excluding the euro area, amounted to almost USD 3.5 trillion in the fourth quarter of 2006 (see Chart 6b), lower panel, lower diagram). The amount of such cross-border deposits that is denominated in euro remains relatively small, standing at around USD 300 billion in the fourth quarter of 2006 or around 9% of the total. As for international loans, it is possible to identify a narrow measure of the international deposit market by only including cross-border transactions denominated in a currency which is neither the home currency of the depositor nor that of the deposit-taking bank. According to this narrow measure, which covers almost a half of the total extra-euro area cross-border deposit market, the euro share was equal to 18% in the fourth quarter of 2006, at current exchange rates.

Data on the currency composition of international deposit markets enable the role of the euro to be gauged in the recycling of oil revenues by oil exporting countries, which have been accumulating a large stock of financial assets thanks to higher energy prices, at least for the part of these revenues reinvested through the international banking system. With regard to the currency composition of these deposits, BIS data reveal that the share of euro-denominated deposits in total net deposits of major oil exporters has increased over the medium term. However, since the last review, the euro share has decreased in deposits held by OPEC countries, while it continued to increase for Russia (see Box 2).

<sup>19</sup> It is worth noting that these residents in offshore centres are mainly non-bank financial entities holding deposits in euro area banks.

## Box 2

### THE ROLE OF THE EURO IN THE RECYCLING OF OIL REVENUES IN THE INTERNATIONAL BANKING SYSTEM: AN UPDATE

Since the December 2005 Review, high energy prices have further increased oil revenues in the world's most important oil exporting countries, resulting in larger current account surpluses and strong capital outflows from these economies.

For example, Russia and the members of the Organisation of Oil Exporting Countries (OPEC) are estimated to have increased their oil revenues by around one third, to more than USD 770 billion in 2006. Although oil exporting economies have also recorded a substantial increase in imports, this expansion in spending has not been sufficient to entirely absorb rising oil revenues. Accordingly, Russia and OPEC economies, taken together, recorded a current account surplus of around USD 475 billion in 2006, and part of the “windfall gains” from higher oil prices have been invested in global financial markets.

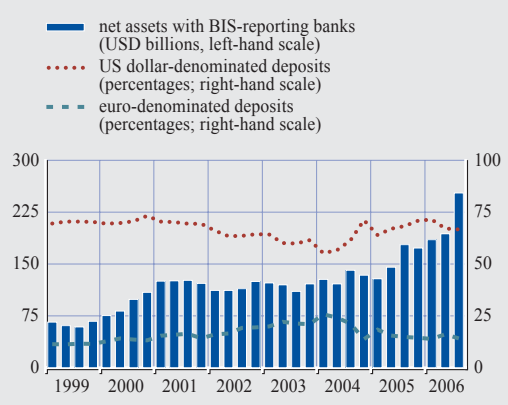
As a consequence, net financial outflows from oil exporting economies increased by more than half in 2006 and exceeded USD 470 billion. A significant part of these outflows still take the form of reserve accumulation, whereas the rest is statistically recorded as portfolio investment in foreign debt and equity securities, though it is difficult to disentangle the public from the private component.

It is not easy to track the precise destination and currency composition of these capital flows. Traditionally, oil exporters favour investment in US dollar-denominated assets within the United States. However, more recently, according to many financial analysts, an increasing share of the flows originating from windfall gains relating to higher oil prices could have been allocated to other markets and currencies. A closer look at data on oil exporters’ deposits with the international banking system – which however capture only a fraction of the international investment by these economies – sheds some light on the role of the euro in the recycling of oil revenues and only partially confirms dominant views in the financial press.

The additional revenues from the oil price cycle that started in 2003 only seem to have found their way into the international banking system in 2005. Since then, however, OPEC economies and Russia – which just five years ago was still a net debtor to the international banking system – have almost doubled their net deposits with the international banking system.

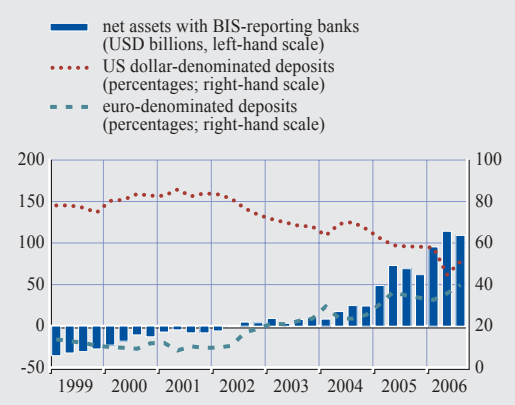
As to the currency composition of net deposits, developments in Russia and OPEC economies have been somewhat less homogeneous. While in both cases the share of euro-denominated net

**Chart A OPEC’s net assets and the currency share of its deposits**



Sources: BIS and ECB staff calculations.  
Note: OPEC is based on an estimate that excludes Indonesia and Venezuela.

**Chart B Russia’s net assets and the currency share of its deposits**



Sources: BIS and ECB staff calculations.

deposits has increased since the start of EMU in 1999, this rise has been much more pronounced in the case of Russia. Moreover, since the last review, the euro share decreased in OPEC countries, while it continued to increase in Russia.

Following the introduction of the euro, OPEC economies gradually increased the share of euro-denominated assets, reaching a peak of 26% in the first quarter of 2004, while at the same time the share of US dollar-denominated assets decreased. Since then, however, the average euro share has constantly declined. The euro share further declined from 18% in the first quarter of 2005 (last review) to 15% in the first three quarters of 2006, suggesting that the additional oil revenues that have been channelled into the international banking system since mid-2005 are mainly invested in US dollar-denominated assets.

In the case of Russia, the increasing role of the euro in the recycling of oil revenues is much more noticeable. While the share of euro deposits with the international banking system decreased in the early years of EMU, it climbed from around 9% at the beginning of 2002 to 40% in the third quarter of 2006. Over the review period, since the first quarter of 2005, the euro share posted an increase of 10 percentage points. In parallel, the US dollar share in total Russian deposits abroad peaked at 86% in mid-2001 and has since fallen to 51%.



### 3 THE EURO IN FOREIGN EXCHANGE MARKETS

*Evidence from foreign exchange trades settled via Continuous Linked Settlement (CLS) suggests that the average euro share in daily settlements decreased to around 39% during the period under review, compared to close to 41% in the previous review period.*

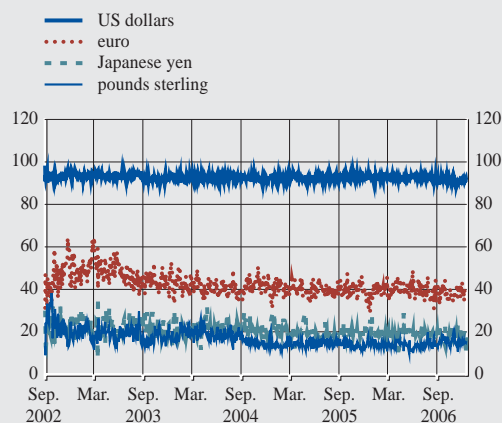
New evidence on the use of the euro in foreign exchange markets is limited<sup>20</sup> to the analysis of data on foreign exchange trading derived from the volumes and values of foreign exchange transactions settled by the Continuous Linked Settlement system.<sup>21</sup> In total numbers, the settlement volumes and values of foreign exchange transactions processed via CLS have grown continuously since the introduction of CLS in September 2002. There are several factors that are responsible for this growth, most importantly the further increase in the number of CLS third-party users<sup>22</sup> (from 660 at the end of 2005 to 900 at the end of 2006), the fact that existing CLS members settle a larger share of their foreign exchange trades in CLS, and the inclusion of new CLS eligible currencies. Currently, CLS Bank settles transactions in 15 currencies (up from seven originally).<sup>23</sup> In December 2006, CLS Bank settled a daily average of close to 290,000 foreign exchange

transactions with a gross value equivalent to more than €2,600 billion per day.<sup>24</sup> In terms of value, CLS is the second largest payment system settling euro transactions after TARGET. In December 2006, the daily value of euro transactions settled in CLS amounted to €489 billion.

Between July 2005 and December 2006, the euro was the second most widely settled currency by CLS (see Chart 7). Compared to the previous review period (July 2004-June 2005), its share slightly declined from an average of 40.7% to 39.3%.<sup>25</sup> This can probably be explained by the fact that CLS started the settlement of four additional currencies in

**Chart 7 Settlement CLS system: currency breakdown<sup>1)</sup>**

(as a percentage<sup>2)</sup> of total transactions settled)



Sources: CLS and ECB calculations.

1) Only days when CHF, EUR, GBP, JPY and USD are traded actively are considered.

2) 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.

20 Data on the role of the euro in foreign exchange markets is also available from the BIS "Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity". The most recent triennial survey was carried out between April and June 2007. Preliminary results will be available in September 2007, with the final report expected to be published at the end of 2007.

21 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 (PVP) basis, as soon as sufficient funds are available.

22 CLS third party-users can be banks, fund managers, non-bank financial institutions and corporations. These entities do not have a direct relationship with CLS Bank, but use (trademark) CLS settlement services of CLS members. Accordingly, a CLS third-party has to select a member who must handle all its instructions and financial flows, which are consolidated in the CLS system. The terms on which CLS members can act on behalf of third-parties are governed by contractual arrangements.

23 CLS provides foreign exchange settlement services for the euro, US dollar, Japanese yen, pound sterling, Australian dollar, Canadian dollar, Danish krone, Norwegian krone, Singapore dollar, Swedish krona, Swiss franc, Hong Kong dollar, Korean won, New Zealand dollar and South African rand.

24 The volumes and values of settled foreign exchange transactions amount to double the volumes and values of foreign exchange trades because every trade involves two settlements legs, one in each currency. Thus, CLS settled an average of 145,000 trades per day with a total value equivalent to €1,300 billion.

25 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.

September 2004, thereby lowering the share of other currencies settled by CLS.<sup>26</sup> Indeed, the shares of the Japanese yen and the pound sterling fell from 20.7% to 18.7% and from 15.2% to 14.3%, respectively. By contrast, the US dollar share was stable at 92.6% (92.5% in the previous reporting period), reflecting the dominant role of the US dollar as a vehicle currency in global foreign exchange markets.<sup>27</sup>

26 On 24 September 2004, CLS started to settle transactions in Hong Kong dollars, Korean won, New Zealand dollars and South African rand. In December 2006, these three currencies accounted on average for 6.1% of all CLS settlements.

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

## 4 THE EURO IN INTERNATIONAL TRADE IN GOODS AND SERVICES

*In the current review period, the role of the euro as a settlement currency for exports of goods of euro area countries appears to have stabilised, after increasing significantly in previous years. The euro share in goods imported by euro area countries shows a notable fall, possibly related to developments in energy markets. Regarding exports and imports of services of euro area countries, the upward trend of settlement in euro seems to have continued.*

*For countries outside the euro area, the euro share in invoicing or settlement of trade continues to outstrip the share of trade with the euro area in non-euro area EU members and EU candidate countries, a pattern which cannot be observed for countries outside the euro area's neighbourhood. This finding confirms the results of the last Review's Special Focus on the determinants on the currency of invoicing in international trade, namely that institutional factors, such as being part of the EU or an EU candidate country, are highly significant in explaining the use of the euro in international trade.*

This section presents updated information on the role of the euro in invoicing or settlement of international trade,<sup>28</sup> based on data that have been collected by the ESCB and publicly available data from several non-EU countries. In the past, these data were largely derived from settlement systems, i.e. the reporting by banks of cross-border payments initiated and received by their resident customers. As settlement systems in several EU countries have been phased out, the Eurosystem has launched a special data collection exercise in 2006, to supplement data from settlement systems still in operation in various EU countries with data derived from other sources, such as customs information or ad hoc surveys. The results of this exercise are reported in Box 3.

### 4.1 THE ROLE OF THE EURO IN INTERNATIONAL TRADE IN GOODS AND SERVICES BY SELECTED EURO AREA COUNTRIES

The use of the euro as a currency for the settlement or invoicing of international trade transactions by euro area countries<sup>29</sup> has shown a notable increase in recent years. More recently, however, the role of the euro as a settlement currency for euro area exports of goods appears to have stabilised, while it declined notably for goods' imports, possibly in relation to developments in energy markets in the course of 2005. By contrast, the upward trend seems to have continued for services.

Regarding exports, the growing use of the euro in extra-euro area exports of goods observed over the last years seems to have levelled off (see Table 11). The drop is most prominent in Greece, where it is related to a rising volume and value of exports of ships in 2005, which are predominantly settled in US dollars. The country's traditionally high exposure to the maritime transportation sector also explains its overall lower share of settlements denominated in euro, as transactions in this sector are usually conducted in US dollars. Nevertheless, the euro share in goods' exports in 2005 stayed significantly above its 2001 level, with the exception of France, which already had a comparatively high share of settlement in euro in 2001. Turning to extra-euro area exports of services, their share increased for all euro area countries for which data are available. The rise

28 Two counterparts may agree that trade is invoiced in a given currency, but settled in another currency. Therefore, data reported according to the currency of invoicing (i.e. the currency of denomination of contracts) and data reported according to the currency of settlement (i.e. the currency in which the corresponding payments are made through the banking system) may differ. While academic literature mainly focuses on invoicing as a determinant of the pricing behaviour of international corporations, available data refer to the settlement currency in many cases.

29 Not all euro area countries compile data on the currency of settlement or invoicing of their international trade transactions on a regular basis. Of the 12 euro area members in the period under consideration, Finland, France, Germany, Greece, Italy, Luxembourg, Portugal and Spain were able to provide this information for 2005 and previous years. See Box 3 regarding the special data collection exercise carried out in the first quarter of 2006.

**Table 11 The euro share as a settlement/invoicing currency in extra-euro area exports of goods and services of selected euro area countries**

(as a percentage of the total)

	Goods					Services				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
France <sup>1)</sup>	50.8	50.5	49.0	49.2	49.9	40.0	40.3	42.4	40.2	42.4
Germany	...	49.0	63.0	61.1	61.0	...	...	...	...	...
Greece	23.5	39.3	47.3	44.3	39.1	11.3	13.3	16.3	14.1	15.6
Italy	52.7	54.1	58.2	59.0	57.3	39.7	43.1	47.0	48.6	56.8
Luxembourg	...	44.0	51.5	61.8	61.4	...	40.4	41.6	41.9	42.4
Portugal	40.3	44.1	50.5	55.4	56.6	41.2	47.2	53.4	56.1	58.0
Spain	52.1	57.6	61.8	62.5	62.0	53.3	59.5	64.1	64.3	66.9

Sources: National central banks and ECB calculations.

Notes: (...) stands for "not available". 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 for Germany, which 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, 2003, 2004 and 2005 on behalf of the Deutsche Bundesbank. Data on services for Luxembourg include travel, whereas travel is excluded for France, Greece, Italy, Portugal and Spain.

1) Data for goods for 2005 are based on estimates.

was most pronounced in Italy, where the invoicing of services' exports rose from 66.5% in 2004 to 72.4% in 2005. Developments for the remaining countries were more subdued, with increases ranging from 0.5 percentage point in Luxembourg to 2.6 percentage points in Spain.

With regard to imports (see Table 12), the euro share in imports of goods from countries outside the euro area fell significantly in 2005. This may have been related to the rising value of energy imports. Since trade in these products is mainly denominated in US dollars, the ascending

US dollar share in total imports on the back of surging energy prices could explain why fewer imports were settled in euro in the course of 2005. Furthermore, country-specific factors played a part, with Luxembourg registering more transactions in precious metals and Greece an increase in the import of ships, with both items largely settled in US dollars. For extra-euro area imports of services, the euro share continued to increase by 1.0 percentage point to 3.2 percentage points. Only Portugal registered a slight drop in services' imports settled in euro, falling to the level recorded in 2003.

**Table 12 The euro share as a settlement/invoicing currency in extra-euro area imports of goods and services of selected euro area countries**

(as a percentage of the total)

	Goods					Services				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
France <sup>1)</sup>	42.6	40.8	39.6	40.5	41.5	43.3	44.0	46.6	48.3	49.5
Germany	...	48.0	55.2	52.8	55.2	...	...	...	...	...
Greece	29.3	35.8	39.6	40.6	34.1	15.3	16.8	20.1	22.7	24.0
Italy	40.8	44.2	44.5	41.2	37.7	45.2	53.2	54.4	57.4	59.5
Luxembourg	...	31.9	41.9	50.0	43.8	...	27.7	34.3	30.2	31.2
Portugal	50.4	54.7	57.9	57.7	53.6	63.0	65.5	69.4	71.3	69.8
Spain	49.8	55.9	61.1	61.4	55.9	45.2	48.8	54.3	57.0	60.2

Sources: National central banks and ECB calculations.

Notes: (...) stands for "not available". 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 for Germany, which 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, 2003, 2004 and 2005 on behalf of the Deutsche Bundesbank. Data on services for Luxembourg include travel, whereas travel is excluded for France, Greece, Italy, Portugal and Spain.

1) Data for goods for 2005 are based on estimates.

### Box 3

#### THE ROLE OF THE EURO IN EURO AREA IMPORTS AND EXPORTS OF GOODS OUTSIDE THE EU

In the framework of a special exercise conducted by the Eurosystem in the first quarter of 2006, data regarding the invoicing currency of exports and imports of goods vis-à-vis countries outside the EU were collected from nearly all euro area Member States. This exercise has enabled the share of the euro and the US dollar in exports and imports vis-à-vis countries outside the European Union to be estimated for the euro area as a whole.

Most of the data collected in previous years, which focused on the currency denomination of exports and imports of goods and services vis-à-vis countries outside the euro area, were derived from the reporting by banks of cross-border payments initiated and received by their resident customers (which were thus referred to as the currency of settlement of these transactions). However, such reporting systems are increasingly substituted by surveys directly addressed to economic agents involved in cross-border activities with non-residents.

The ESCB has therefore investigated possible alternative sources with respect to the currency denomination of trade. One cost effective and high quality alternative source for this information refers to the data reported to customs authorities on transactions in goods with countries outside the EU, which provide information on the currency of invoicing of these transactions.

As a result, the Eurosystem has launched a special data collection exercise in 2006, in order to supplement available data from settlement systems with data derived from customs information and other sources (e.g. ad hoc surveys). The effort has focused on the first quarter of 2006, rather than on annual data, in order to reduce the reporting burden as much as possible.

The newly collected data, as summarised in Table A above, show a significant dispersion in the use of the euro in extra-EU exports and imports of euro area countries. On average, the euro is

**Table A The euro share as a settlement/invoicing currency in extra-EU exports and imports of goods**

(as a percentage of the total)

2006 Q1	Exports						Imports					
	EUR	USD	JPY	GBP	Other	Total	EUR	USD	JPY	GBP	Other	Total
Austria	62.9	23.4	0.0	0.0	13.7	100.0	60.9	27.2	0.0	0.0	11.9	100.0
Belgium	50.0	36.9	0.9	12.3	...	100.0	46.3	41.8	2.0	9.9	0.0	100.0
Finland	44.0	47.6	...	...	8.4	100.0	29.6	62.8	...	...	7.6	100.0
France	43.2	50.5	2.2	0.2	3.9	100.0	32.9	60.3	2.0	0.1	4.7	100.0
Germany	...	...	...	...	...	...	40.9	40.3	3.2	2.3	13.3	100.0
Greece	28.1	70.7	0.3	0.2	0.7	100.0	18.0	80.0	0.8	0.2	1.0	100.0
Ireland	46.6	50.1	0.8	0.7	1.8	100.0	19.4	69.3	0.7	0.2	10.3	100.0
Italy	53.7	43.4	...	...	2.9	100.0	27.5	69.8	...	...	2.7	100.0
Luxembourg	29.6	68.0	0.6	1.1	0.7	100.0	33.5	52.2	8.7	1.8	3.9	100.0
Netherland	52.5	42.1	0.8	0.7	3.9	100.0	23.4	76.3	0.1	0.1	0.1	100.0
Portugal	48.9	47.1	0.3	0.3	3.5	100.0	43.4	52.1	1.8	0.1	2.7	100.0
Spain	53.6	43.4	1.2	0.1	1.7	100.0	44.2	54.4	0.7	0.0	0.7	100.0
Euro area	49.7	44.0	...	...	6.3	100.0	35.2	55.7	...	...	9.0	100.0

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

Notes: (...) stands for "not available". Data for France are based on estimates. German imports do not fully cover oil.

**Table B The euro share as a settlement/invoicing currency in exports and imports of goods to/from EU countries outside the euro area**

(as a percentage of the total)

2006 Q1	Exports						Imports					
	EUR	USD	JPY	GBP	Other	Total	EUR	USD	JPY	GBP	Other	Total
Italy	68.5	19.8	...	...	11.7	100.0	71.8	23.5	...	...	4.7	100.0
Luxembourg	73.7	4.1	0.4	15.6	6.1	100.0	73.1	10.1	0.0	13.4	3.5	100.0
Portugal	68.3	15.8	0.0	13.6	2.4	100.0	79.1	14.5	0.0	5.3	1.1	100.0
Spain	72.2	12.6	0.1	13.5	1.7	100.0	76.1	19.2	0.2	3.9	0.5	100.0
France	63.4	12.9	0.1	20.5	3.0	100.0	51.0	28.8	0.3	18.0	1.9	100.0
Greece	64.1	23.9	0.0	10.8	1.2	100.0	77.1	17.4	0.0	4.6	0.9	100.0

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

Notes: (...) stands for "not available". Data for France are based on estimates.

used in half of the euro area exports outside the EU, slightly surpassing the US dollar, which is used in around 44% of the transactions in value terms. In contrast, the US dollar is used in the majority of transactions regarding euro area imports vis-à-vis countries outside the EU, whereas the euro share accounts for only 36%. Additional breakdowns available in some countries help to explain the divergence between the currency denomination of imports and exports. For the Netherlands, the high proportion of imports from China and oil-producing countries contributed to the considerable share (76 %) of the US dollar in their imports.<sup>1</sup> An activity breakdown of Finnish data similarly confirms that the high US dollar share in Finnish imports is largely driven by the use of this currency for imports of crude materials (both fuels and other crude materials). Additional data for Greece also highlight the significant role of oil within US dollar-denominated imports.

Furthermore, data reveal that in general currencies other than the euro and the US dollar only play a marginal role in transactions of euro area countries with non-EU countries.

As can be observed by comparing Table A above with tables 11 and 12 of this Review, the euro share in trade vis-à-vis countries outside the EU is significantly lower than its share in trade vis-à-vis countries outside the euro area, reflecting the widespread use of the euro in cross-border transactions between the euro area and other EU Member States. This is in line with the general feature of the international role of the euro, namely its strong regional focus on euro area neighbouring countries and regions.

Table B shows the currency breakdown of transactions by several euro area Member States vis-à-vis EU Member States outside the euro area, which illustrates this outcome. This Table also highlights the significant role played by the British pound in these transactions. However, its use is much lower than the euro area's actual transactions with the United Kingdom, which amount to 49% (exports) and 47% (imports) of all trade the euro area conducts with EU Member States outside the euro area.

<sup>1</sup> These imports may include goods re-exported to other EU countries.

## 4.2 THE ROLE OF THE EURO IN INTERNATIONAL TRADE IN GOODS AND SERVICES BY THIRD COUNTRIES

The evidence presented below on the currency breakdown of international trade for non-euro area EU countries has been compiled by the national central banks of the ESCB. Data for other countries has been compiled from publicly available sources and through bilateral requests from the ECB to other central banks and institutions.

For non-euro area EU Member States as well as EU candidate countries for which 2005 data are available, the euro remains the dominant currency of invoicing or settlement, both for exports (Table 13) and imports (Table 14). Moreover, as observed in previous years, invoicing or settlement of trade of non-euro area EU Member States and EU candidate

countries continued to outstrip the magnitude of trade with the euro area, sometimes by a wide margin, implying a comparatively high share of euro-denominated transactions with third countries. This pattern cannot be observed in Ukraine and the two countries in Asia for which data could be obtained. Thus, 2005 data on the role of the euro in international trade in goods and services by third countries are in line with the results of the last Review's Special Focus on the determinants of the currency invoicing in international trade, namely that institutional factors, such as being a Member State of the EU or an EU candidate country, are highly significant.

The euro share in exports of non-euro area EU Member States remained roughly stable for most of the nine countries for which 2005 data are available. With regard to imports, the share of imports from the euro area fell in most

**Table 13 The euro share in exports of selected non-euro area countries**

(percentage of total exports)

	Exports invoiced/settled in euro					Exports to the euro area				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
<b>Non-euro area EU countries</b>										
Bulgaria	48	52	61	62	60	46	47	47	45	49
Cyprus	...	...	30	32	39 <sup>2)</sup>	19	22	23	28	49
Czech Republic <sup>1)</sup>	69	68	70	73	72	62	61	63	62	59
Estonia <sup>1)</sup>	53	64	65	62	59	41	37	39	40	40
Latvia	34	40	42	48	53	30	29	30	24	24
Lithuania	28	37	47	50	51	26	26	27	30	29
Poland	57	60	65	69	70	59	58	58	56	54
Romania	56	59	64	66	64	62	61	60	58	53
Slovenia	85	87	87	88	88	58	55	55	54	54
<b>EU candidate countries</b>										
Croatia	63	69	72	69	71	51	49	52	49	45
FYR Macedonia	...	66	67	75	75	46	48	51	51	48
Turkey	...	47	49	50	48	43	41	42	41	39
<b>Other countries</b>										
Indonesia	...	...	...	2	2	11	11	11	10	10
Thailand	3	3	3	3	3	12	11	11	11	10
Ukraine	...	4	5	6	7	16	16	17	17	15

Sources: IMF, national sources. Data for Croatia, Turkey and the former Yugoslav Republic of Macedonia have been kindly provided by the Croatian National Bank, the Turkish Undersecretariat of the Ministry for Foreign Trade and the State Statistical Office of the Republic of Macedonia respectively.

Note: (...) stands for "not available".

1) As a result of changes in the way data are collected from 2004 onwards, figures for the Czech Republic and Estonia are not comparable with previous years.

2) Data for Cyprus refer to Q1 2006.

**Table 14 The euro share in imports of selected non-euro area countries**

(percentage of total imports)

	Imports invoiced/settled in euro					Imports from the euro area				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
<b>Non-euro area EU countries</b>										
Bulgaria	55	60	63	64	60	44	45	44	43	40
Cyprus	...	...	45	53	58 <sup>2)</sup>	40	42	45	53	54
Czech Republic <sup>1)</sup>	67	67	68	71	71	57	56	55	56	53
Estonia <sup>1)</sup>	56	61	62	57	59	39	41	40	47	46
Latvia	45	52	50	53	59	40	41	39	34	34
Lithuania	38	49	53	55	51	35	35	35	36	32
Poland	57	60	60	62	60	53	53	53	52	58
Romania	61	66	68	71	71	53	53	53	51	48
Slovenia	79	83	82	83	82	64	64	64	72	67
<b>EU candidate countries</b>										
Croatia	73	77	78	78	74	50	50	51	49	46
FYR Macedonia	...	68	71	75	71	39	42	41	37	34
Turkey	...	37	40	40	38	38	39	39	38	33
<b>Other countries</b>										
Indonesia	...	...	...	6	4	10	9	9	9	8
Thailand	5	5	4	5	4	10	9	8	8	7
Ukraine	...	11	15	14	18	19	20	20	20	20

Sources: IMF, national sources. Data for Croatia, Turkey and the former Yugoslav Republic of Macedonia have been kindly provided by the Croatian National Bank, the Turkish Undersecretariat of the Ministry for Foreign Trade and the State Statistical Office of the Republic of Macedonia respectively.

Note: (...) stands for "not available".

1) As a result of changes in the way data are collected from 2004 onwards, figures for the Czech Republic and Estonia are not comparable with previous years.

2) Data for Cyprus refer to Q1 2006.

countries, possibly reflecting higher imports due to rising oil and other commodity prices. However, while these developments imply a fall in the share of imports denominated in euro, it remained roughly constant or even rose for the majority of countries. Latvian trade in euro grew by 5 percentage points for exports and 6 percentage points for imports in 2005, while the euro area share in Latvia's trade remained constant. The pegging of the Latvian lats to the euro starting in January 2005 might have contributed to this development.

Indonesia and Thailand, the only countries in Asia for which data on the invoicing or settlement of trade could be obtained, show a substantially higher share of trade with the euro area than the corresponding euro share in trade. This indicates that the use of the euro in these countries' international trade is very limited. By contrast, a tendency for both shares to

converge over time can be observed for Ukraine, albeit from low levels, in particular for Ukrainian imports.



## B THE EURO IN THIRD COUNTRIES

*This chapter reviews the role of the euro in countries outside the euro area (“third countries”), distinguishing between official and private use. Official use refers mainly to the euro’s role in third countries’ monetary and exchange rate policies, in the form of an anchor or reference currency, a reserve currency or an intervention currency. Private use refers to the use of the euro by private agents in third countries, mainly as a parallel currency in the accumulation of financial assets or in the denomination of specific transactions and contracts.*

### I OFFICIAL USE: THE EURO IN THIRD COUNTRIES’ EXCHANGE RATE POLICIES

*During the review period, the euro maintained its role as an exchange rate anchor for countries in the geographic proximity of the EU and countries that have established special institutional arrangements with the EU or its Member States. The use of the euro in the foreign exchange reserves in third countries has moderately increased during the review period, mostly reflecting positive valuation effects. However, during the review period, the significance of reserves or other foreign assets held by countries which do not disclose the currency composition of their reserve assets has further increased so that these observations have to be interpreted with caution. Finally, the euro continued to be used as an intervention currency in countries that use the euro as a point of reference for their exchange rate policy.*

#### I.1 THE EURO AS AN ANCHOR CURRENCY

Choosing the appropriate exchange rate regime is one of the key policy choices for monetary authorities, with additional implications for the size and composition of foreign reserves and interventions. In its latest report on exchange rate arrangements, the IMF lists about 100 countries with exchange rate regimes involving a reference currency or a basket of reference currencies<sup>30</sup>.

According to the IMF, 18 of these countries use the euro as the anchor of exchange rate policies. Taking countries which are members of a currency union such as the Central African Economic and Monetary Community (CAEMC) and the West African Economic and Monetary Unions (WAEMU) separately and adding countries in which the euro is used as a point of reference as part of a currency basket yields, as in the past, a total number of around 40 countries using the euro as a point of reference for their exchange rate policy (see Table 15)<sup>31</sup>.

As in previous years, the use of the euro in third countries’ exchange rate regimes has a strong geographical and institutional underpinning, as it is observed mainly in EU neighbouring

regions and in countries that have established special institutional arrangements with the EU or its Member States. With the exception of those countries participating in the exchange rate mechanism II (ERM II), the decision to use the euro as an anchor currency is a unilateral decision and does not involve any commitment on the part of the Eurosystem.

#### DEVELOPMENTS IN THE PERIOD UNDER REVIEW

In the period under review, exchange rate regime changes involving the euro as an anchor currency took place in Slovenia, the Slovak Republic and Russia. Slovenia introduced the euro as of 1 January 2007 and therefore left ERM II as of 31 December 2006. Slovakia joined ERM II on 25 November 2005. In Russia, as at 2 December 2005, the weight of the euro

<sup>30</sup> In this report, some currency unions are counted as one country, e.g. the Central African Economic and Monetary Community (CAEMC) and the West African Economic and Monetary Unions (WAEMU).

<sup>31</sup> Other entities linking their exchange rate regimes to the euro include the French territorial communities and overseas territories (Saint-Pierre-et-Miquelon, Mayotte, French Polynesia, New Caledonia, and Wallis and Futuna), the European microstates that are not IMF members (the Vatican City, and the principalities of Monaco and Andorra), as well as Kosovo (see Table 15). As a result, a combined total of 50 countries and territories have an exchange rate regime involving the euro.

**Table 15 Countries with exchange rate regimes linked to the euro**

(as at 1 January 2007)

Region	Exchange rate regimes	Countries
<b>European Union (non-euro area)</b>	ERM II	Cyprus, Denmark, Estonia <sup>1)</sup> , Latvia <sup>2)</sup> , Lithuania <sup>1)</sup> , Malta <sup>3)</sup> , Slovakia
	Euro-based currency boards	Bulgaria
	Peg arrangements with fluctuation band based on the euro	Hungary
	Managed floating with the euro as reference currency	Czech Republic, Romania
	<i>Pro memoria</i> : Independent floating	Sweden, United Kingdom, Poland
<b>Candidate and potential candidate countries</b>	Unilateral euroisation	Montenegro
	Euro-based currency boards	Bosnia and Herzegovina
	Peg arrangements or managed floating with the euro as reference currency	Croatia, FYR Macedonia, Serbia <sup>4)</sup>
	<i>Pro memoria</i> : Independent floating	Albania, Turkey
<b>Others</b>	Euroisation	Kosovo <sup>5)</sup> , European microstates <sup>6)</sup> , French territorial communities <sup>7)</sup>
	Peg arrangements based on the euro	CFA Franc Zone <sup>8)</sup> , French overseas territories <sup>9)</sup> , Cape Verde, Comoros
	Peg arrangements and managed floats based on the SDR and other currency baskets involving the euro (share of the euro)	Seychelles (37.7%), Russian Federation (40%) <sup>10)</sup> , Libya, Botswana <sup>11)</sup> , Morocco <sup>12)</sup> , Tunisia <sup>13)</sup> , Vanuatu <sup>14)</sup>

Sources: IMF and ECB compilation.

1) Unilateral commitment to a currency board.

2) Unilateral commitment to an exchange rate fluctuation band of  $\pm 1\%$ .

3) Unilateral commitment to maintain a fixed exchange rate.

4) In September 2006, Serbia adopted a new monetary policy framework with the aim of adopting a fully-fledged inflation targeting regime in the future.

5) Unilateral euroisation.

6) Republic of San Marino, Vatican City, Principality of Monaco, Andorra. In the case of Andorra: unilateral euroisation. The other countries and jurisdictions are entitled to use the euro as their official currency.

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) 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 December 2005 euro share of 40%).

11) Weighted basket of currencies comprising the SDR and the South African rand.

12) Weighted basket in accordance with the distribution of Morocco's foreign trade and the pattern of currencies of settlement.

13) Real effective exchange rate target.

14) Weighted (trade and tourism receipts) basket of currencies of Vanuatu's major trading partners.

in the Bank of Russia's operational basket for daily exchange rate management rose to 40% (from 35%). Outside the review period, in February 2007, the Bank of Russia stated that this share has been further raised to 45%. In addition, the euro share (and currencies with an exchange rate pegged to the euro) in the basket for the computation of Russia's real effective exchange rate has been raised by 4 percentage points to around 60%.<sup>32</sup>

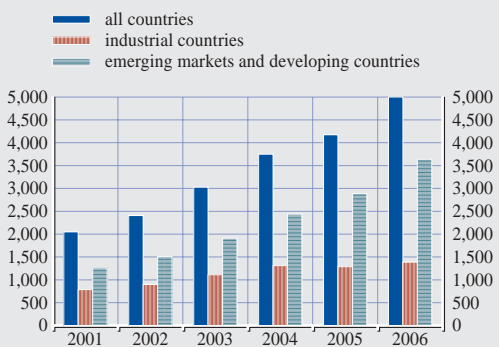
## 1.2 THE EURO AS A RESERVE CURRENCY

The global reserve build-up continued in the course of 2006. In December 2006 global foreign exchange reserves stood at USD 5,028 billion, an increase of 34% from the figure of

<sup>32</sup> In its monetary framework, the Bank of Russia aims at limiting the rouble's appreciation against this trade-weighted basket. In addition, it maintains an operational currency basket as a reference for the daily management of rouble volatility.

**Chart 8 Global foreign exchange reserves**

(USD billions, year-end)



Source: IMF.

USD 3,748 billion at the end of 2004 (see Chart 8).<sup>33</sup> This mainly reflected developments in emerging markets and developing countries, where foreign exchange reserve assets grew at a pace of almost 50% in US dollar terms since the end of 2004. At the same time, foreign assets have also been accumulated outside traditional foreign exchange reserves held by central banks in “sovereign wealth funds” (see Box 4). By contrast, reserve growth in industrialised countries remained subdued, reaching about 6% compared with the end of 2004.

The IMF’s Currency Composition of Official Foreign Exchange Reserves (COFER) data remain the only official source for the currency composition of foreign exchange reserves at the global level.<sup>34</sup> Until September 2005, COFER data were only published annually in an annex of the IMF’s Annual Report. Since December 2005, however, they are published on a quarterly basis on the IMF website, allowing developments in the currency composition of foreign exchange reserves to be more easily tracked.<sup>35</sup> However, as explained in detail in the December 2005 Review, since the end of 2005 COFER data are based only on foreign exchange reserves held by central banks that actually disclose the currency composition of their foreign exchange holdings to the IMF<sup>36</sup>.

The implications of this shortcoming are significant, as in the fourth quarter of 2006 more than one third of global reserves, i.e. USD 1,693 billion out of USD 5,028 billion (see Chart in Box 4) were held by central banks that do not disclose the currency composition of their foreign exchange reserves. Moreover, the share of undisclosed reserves in total reserves has been steadily increasing over time and in the review period it rose from 29.5% in December 2004 to 33.8% in December 2006, as developing and emerging market economies have been increasing their share in global reserve holdings substantially over the last years. In particular, it is important to recall that major reserve accumulators, most notably in Asia, are not covered. This means that

- around 46% of foreign exchange reserves held by developing and emerging market countries cannot be allocated according to the currency reserve assets are denominated in; and
- the currency composition of around 46% of the global reserve accumulation of the last two years is unknown.

Thus, it is not possible to draw definite conclusions from the analysis of COFER data

<sup>33</sup> The section on foreign exchange reserves covers the review period from end-2004 to end-2006. Since December 2005, the IMF has been publishing quarterly figures on the currency composition of global foreign exchange reserves. This allows for a presentation of more recent year-end figures than in the past.

<sup>34</sup> Throughout this Review, the currency composition of foreign exchange reserves refers to the stock of foreign exchange reserves. Changes to the currency composition of the stock of reserves are assumed to materialise through an altered composition of reserve flows or valuation effects.

<sup>35</sup> The change in the frequency of reporting data on the currency composition of foreign exchange reserves has been a motivating factor in shifting the publication schedule of this Review to mid-year, as it allows for a timely analysis of end-year data on trends in the currency composition of foreign exchange reserves. Moreover, since most of the data reported and analysed in this review are quarterly data, the new publication schedule provides the opportunity to present and analyse end-year data for other segments of the international use of the euro as well.

<sup>36</sup> In previously published data, the IMF often resorted to its own estimates about the currency shares in the respective reserve portfolios when countries did not report the currency composition of their reserves.

on global currency diversification trends in foreign exchange reserve portfolios.

Taking into account the limited nature of the COFER data coverage, the share of euro-denominated assets in global foreign exchange reserves, measured at current exchange rates, rose to 25.8% in December 2006 (up from 24.9% at the end of 2004, see Table 16). Among

industrialised countries, the euro share has been decreasing (from 20.8% to 20.4%), while it has been moderately rising among developing countries (from 29.0% to 29.6%). As regards other currencies, the US dollar share declined marginally from 65.8% in December 2004 to 64.7% in December 2006. The share of the pound sterling, on the other hand, increased from 3.4% to 4.4% during the same period.

**Box 4**

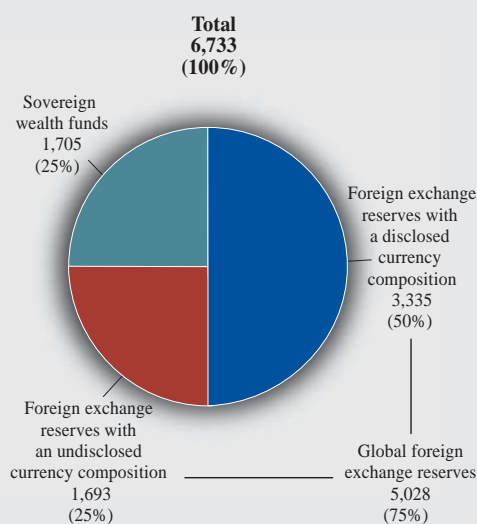
**SOVEREIGN WEALTH FUNDS**

The accumulation of foreign assets by emerging market countries does not take place exclusively within “traditional” foreign exchange reserves held by the respective central banks. In fact, some countries have accumulated foreign assets, in so-called sovereign wealth funds that are typically not managed by the central bank.<sup>1</sup> The objective of these funds is to generate higher returns than traditional reserves which are typically invested in low-yield government securities. According to market estimates, the assets accumulated in such funds could amount to around USD 1.7 trillion, which compares with around USD 5 trillion accumulated in traditional foreign exchange reserves, of which around two-thirds disclose their currency composition (see the chart).<sup>2</sup>

One group of countries that has established sovereign wealth funds comprises resource-rich economies which currently benefit from high oil and commodity prices.<sup>3</sup> In these countries, sovereign wealth funds mainly serve the purpose of stabilising government and export revenues which would otherwise mirror the volatility of oil and commodity prices. Another purpose of such funds in resource-rich countries is saving for future generations, as natural resources are non-renewable and hence are projected to be exhausted in time. For example, in the case of Russia an “oil stabilisation fund” (operational since January 2004) will be supplemented by a “future generations fund” from February 2008. As a consequence of the establishment of sovereign wealth funds, reserve growth in

**Global foreign exchange reserves and sovereign wealth funds**

(USD billions, percentages)



Sources: IMF, Morgan Stanley estimations and ECB calculations.  
 Note: Global foreign exchange reserves as reported by the IMF as at Q4 2006. Sovereign wealth funds include estimates by Morgan Stanley as of February 2007.

1 For an overview, see also the IMF’s Global Financial Stability Report, Chapter II: Changes in the international investor base and implications for financial stability, Washington D.C., pp. 72ff. and Toloui, R. (2007).  
 2 It is not known with certainty whether the foreign assets accumulated by sovereign wealth funds are covered in statistics on the international investment positions of the respective countries (see section 1.3).  
 3 See Barnett, S. and R. Ossowski (2002), and Davies, J., R. Ossowski, J. Daniel and S. Barnett (2001).

some resource-rich countries has been subdued (e.g. in the Gulf Cooperation Council countries and in Norway).

A second group of countries, largely in Asia, have established sovereign wealth funds because the authorities may have accumulated reserves in excess of what might be needed for intervention or balance of payment purposes. As the authorities have become more confident about reserve levels, funds have been moved to specialised agencies which often have explicit return objectives and may invest in riskier assets than central banks. Notable examples include the Singapore Investment Corporation and the Korea Investment Corporation. Outside the review period, the People's Bank of China has announced the establishment of a new investment agency responsible for the management of a portion of Chinese foreign reserves. Its main purpose will be to seek higher returns on a share of China's foreign reserves that is yet to be determined.

With few exceptions, such as the Norwegian Petroleum Fund, most of these funds do not disclose any details of their asset and currency compositions. However, it is likely that the investments they make are more diversified than traditional reserves invested by central banks. This applies not only to the currency composition but also to the allocation of assets in terms of risk. In fact, anecdotal evidence suggests that most sovereign wealth funds invest a share in higher risk assets such as stocks, corporate bonds, emerging market bonds or stocks, and real estate.

Decomposing the US dollar change of foreign exchange reserves into quantity and valuation (price) changes reveals that in 2005, in contrast to previous years, the euro share was affected by negative price effects (see Table 17), reflecting the depreciation of the euro against the US dollar.<sup>37</sup> In 2006, with the euro

appreciating against the US dollar, the euro benefited from positive price effects (except in the third quarter of 2006), which largely accounts for the rise in the share of euro-

<sup>37</sup> SDR changes broken down into price and quantity effects, as presented in previous editions of this review, can be found in the IMF's Annual Report.

**Table 16 Currency shares in foreign exchange reserves with a disclosed currency composition at current exchange rates**

(percentages)

		Dec. 04	Dec. 05	Mar. 06	June 06	Sep. 06	Dec. 06
Global	USD	65.8	66.7	66.5	65.5	65.8	64.7
	EUR	24.9	24.2	24.6	25.4	25.1	25.8
	JPY	3.9	3.6	3.3	3.2	3.1	3.2
	GBP	3.4	3.6	4.0	4.2	4.3	4.4
	Other	2.0	1.8	1.6	1.7	1.7	1.8
Industrialised countries	USD	71.5	73.6	74.0	72.9	73.1	71.9
	EUR	20.8	19.0	19.1	19.8	19.6	20.4
	JPY	3.6	3.4	3.5	3.6	3.5	3.5
	GBP	1.9	2.1	2.1	2.3	2.3	2.5
Developing countries	Other	2.3	1.8	1.4	1.4	1.4	1.6
	USD	60.2	61.0	60.6	59.9	60.4	59.7
	EUR	29.0	28.5	29.0	29.5	29.2	29.6
	JPY	4.1	3.7	3.1	2.9	2.8	2.9
	GBP	4.9	4.9	5.5	5.6	5.7	5.8
	Other	1.8	1.9	1.9	1.9	2.0	2.0

Sources: IMF and ECB calculations.

**Table 17 Changes in foreign exchange reserve holdings**

(USD billions)

	Annual changes		Quarterly changes			
	Dec. 05 vs. Dec. 04	Dec. 06 vs. Dec. 05	Mar. 06 vs. Dec. 05	June 06 vs. Mar. 06	Sep. 06 vs. June 06	Dec. 06 vs. Sep. 06
	<b>World</b>					
Total change	426.1	853.3	182.6	228.2	163.2	279.3
<b>Allocated reserves</b>						
Total change	180.7	508.1	93.6	139.7	102.4	172.5
<i>of which:</i>						
USD-denominated foreign exchange reserves	145.5	272.5	54.8	62.6	76.1	79.1
Quantity effect	145.5	272.5	54.8	62.6	76.1	79.1
Exchange rate effect	0.0	0.0	0.0	0.0	0.0	0.0
EUR-denominated foreign exchange reserves	25.2	175.9	34.0	57.9	18.1	65.9
Quantity effect	118.7	93.3	16.2	21.8	21.3	34.0
Exchange rate effect	-93.5	82.6	17.8	36.1	-3.2	32.0

Sources: IMF and ECB calculations.

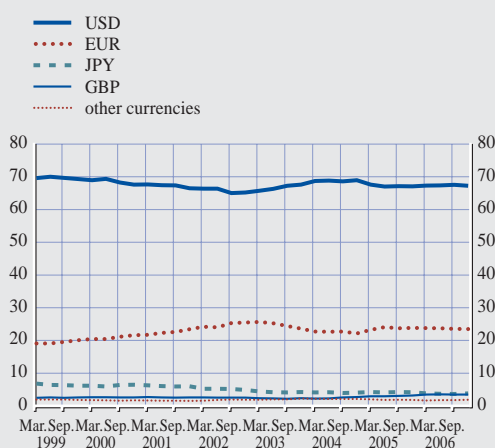
denominated assets in foreign exchange reserves at end-2006.

Measured at constant exchange rates, the euro share in foreign exchange reserves covered by the IMF's quarterly COFER data has remained broadly stable since mid-2005 (see Chart 9). The same applies to the US dollar share, suggesting that over the review period the currency composition of foreign exchange

reserves has shown a remarkable degree of stability, with movements mainly confined to "passive reserve diversification" (Truman and Wong, 2006) which occurs as a result of exchange rate changes.<sup>38</sup> This contrasts with several press reports, partly based on official announcements by some central banks,<sup>39</sup> indicating a tendency to shift away from US dollar holdings in global foreign exchange reserves.

**Chart 9 Currency shares in global foreign exchange reserves (with a disclosed currency composition)**

(percentages, at constant Q1 1994 exchange rates)



Sources: IMF and ECB calculations.

38 The same conclusion can be found in Carver, N. (2007). It is based on the results of a survey on trends in reserve management that was sent to 129 central banks, of which 47 responded. The responding central banks held just over USD 1.5 trillion in reserves, i.e. about 30% of total reserves at the time of the survey (September 2006). Of the central banks that responded, nine had reserve holdings with a value of more than USD 50 billion. Regarding changes in the currency composition of foreign exchange reserves, 21 central banks, mainly from countries neighbouring the euro area, indicated – without specifying amounts – that the euro's weight in their reserves had increased over the twelve months to 31 August 2006.

39 Shifts in the currency composition of foreign exchange reserves have been the subject of press reports and announcements by central banks or central bank officials of countries including Egypt, Italy, Iran, Qatar, Russia, Sweden and the United Arab Emirates. See also the review by Rietveld, M. (2007).

Evidence from the few central banks that publish the currency breakdown of their reserves (see Table 18) suggests that the euro share has increased in most mature economies (with the exception of Australia). Among the new EU Member States that publish the currency composition of their reserves, the euro share has increased in Bulgaria whereas it has slightly decreased, albeit from high levels, in Slovakia. Outside the review period, Česká národní banka has stated that the euro share of its foreign exchange reserves rose from 51.3% at end-2005 to 55.4% in April 2007. In most EU neighbouring countries that disclose the currency composition of their reserves, the euro share remained

broadly stable during the review period, ranging between 40% in Iceland and 85% in Croatia. By contrast, and in line with the general pattern whereby the international role of the euro is significantly smaller in regions and countries that are not geographically close to or institutionally linked with the EU, the share of euro-denominated assets in foreign reserve portfolios is much lower in Latin America, ranging from 1% in Uruguay to 26% in Chile.

The importance of the choice of anchor currency to the currency composition of foreign exchange reserves is the subject of an IMF Working Paper by Lim (2006). One of the main contributions

**Table 18 Currency breakdown of the total foreign exchange reserves of selected countries**

(percentages)

	Euro		US dollar		Japanese yen		Other currencies		latest as at
	June 2005	latest	June 2005	latest	June 2005	latest	June 2005	latest	
<b>G20 countries</b>									
Australia	25	22	63	55	5	19	7 <sup>1)</sup>	4 <sup>1)</sup>	Dec. 06
Canada	43	51	54	47	3	1	0	0	Dec. 06
United Kingdom	56	58	31	33	12	9	0	0	Sep. 06
United States	56 <sup>5)</sup>	61 <sup>5)</sup>	0	0	44 <sup>5)</sup>	39 <sup>5)</sup>	0	0	Dec. 06
<b>New EU Member States</b>									
Bulgaria <sup>6)</sup>	95	100	4	0	0	0	1	0	Dec. 06
Latvia <sup>2)</sup>	59	46	38	44	3	10	0	0	Dec. 06
Lithuania	100	n.a.	0	n.a.	0	n.a.	0	n.a.	
Romania	n.a.	68	n.a.	28	n.a.	0	n.a.	4	Nov. 06
Slovakia	76	69	21	26	0	0	3	5 <sup>1)</sup>	Dec. 06
<b>EU neighbouring countries</b>									
Algeria	n.a.	60	n.a.	40	n.a.	0	n.a.	0	Dec. 06
Croatia	84	85	16	15	n.a.	n.a.	0 <sup>3)</sup>	0 <sup>3)</sup>	Dec. 06
Iceland	40	n.a.	40	n.a.	5	n.a.	15 <sup>4)</sup>	n.a.	
Norway	54	n.a.	38	n.a.	0	n.a.	8	n.a.	
Switzerland	45	47	37	33	1.3	5	16	15	Dec. 06
<b>Other countries</b>									
Chile	27	26	67	67	n.a.	n.a.	6	7	June 06
Colombia	12	12	85	85			3	3	Mar. 06
Peru	n.a.	n.a.	88.4	79.1	n.a.	n.a.	n.a.	n.a.	Dec. 05
Uruguay	n.a.	1	n.a.	99	n.a.	0	n.a.	0	Dec. 06

Sources: Websites of countries authorities and ECB calculations.

Notes: 2005 data for Bulgaria refer to annual average; 2005 data for Iceland refer to annual average; 2005 data for Lithuania refer to the 2005 average and exclude gold; 2005 euro and US dollar currency figures for Norway include other American and European currencies; other currencies include holdings in Japanese yen, as at March 2005. 2005 data for the United Kingdom refer to March, 2006 data to September. Data for Peru are from December 2004 and December 2005. Data for Columbia are taken from the Report by the Board of Directors to the Congress of the Republic of March 2005 and March 2006.

1) Including SDRs and gold.

2) Latvia has been a member of ERM II since May 2005 and changed its currency peg from SDR to the euro in January 2005.

3) Including any holdings of Japanese yen.

4) Pound sterling.

5) Including assets held by the US Treasury Exchange Stabilisation Fund and the Federal Reserve System.

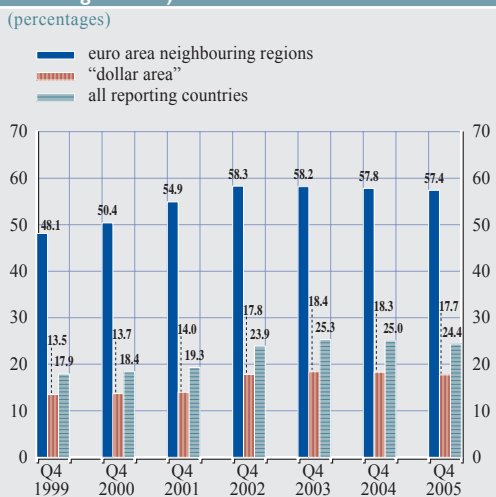
6) Excluding SDRs and gold.

of this paper is the regrouping of the aggregate COFER data into two sub-groups<sup>40</sup>, comprising:

- all European countries surrounding the euro area and all countries worldwide that largely peg their currencies to the euro (“euro area neighbouring regions”),
- Asia, the Western Hemisphere and all countries that largely peg their currencies to the US dollar (“dollar area”).

The two sub-groups show markedly different results for the euro and US dollar shares of their reserves. In the euro area neighbouring regions the euro share rose gradually, starting at a level of about 48% at end-1999 and reaching around 58% in 2002, before stabilising at this level until the third quarter of 2005 (see Chart 10). In the countries of the dollar area the euro share has also increased (from 13.5% at end-1999 to 17.7% in 2005), but the rise has been less pronounced and the share is considerably smaller. The dominance of US dollar-denominated assets in the foreign reserve portfolios of central banks in the dollar area has been greater than the dominance of euro-denominated assets in the euro area neighbouring regions, despite declining slightly, from 77.5% to 75.5%. The drop in the share of US dollar-denominated assets in the reserve portfolios of central banks in the euro area neighbouring regions has been more pronounced, falling from 39.5% to 31.5%, but this is still larger than the euro share in the dollar area. In conclusion, the analysis confirms two long-standing research results, namely (a) that changes in the roles of

**Chart 10 The euro share in global foreign exchange reserves by region (at current exchange rates)**



Source: IMF Working Paper 06/153.

Notes: According to the IMF Working Paper (p. 16), the euro area neighbouring regions comprise all the European countries surrounding the euro area and countries worldwide that largely peg to the euro. The “dollar area” comprises Asia, the Western Hemisphere and various other countries that largely peg to the dollar.

international currencies take place only gradually and (b) that the role of the euro has grown most and is more pronounced in countries in the geographical neighbourhood of the euro area and in countries with an institutional link to the EU. Moreover, the analysis suggests that the choice of reserve currency is closely linked to anchor currency considerations. This finding is also supported by other empirical and theoretical studies on the currency composition of reserves (see Box 5).

<sup>40</sup> While the precise country composition of these aggregates has not been made public, the two sub-groups cover 83% of the allocated reserves of all countries reporting the currency composition of their reserves to the IMF.

**Box 5**

**THE CURRENCY COMPOSITION OF FOREIGN EXCHANGE RESERVES – A SURVEY OF THE LITERATURE**

Total international foreign exchange reserves reached USD 5 trillion at the end of 2006, having more than doubled since end-2002. According to the IMF’s COFER data (see Table 16 in the main text), currently almost two-thirds of global foreign reserves with a known currency composition are held in US dollar-denominated assets, while about one-fourth are in euro-denominated assets. The significance and magnitude of these figures have sparked a lively



debate about the driving forces behind these developments.<sup>1</sup> This box reviews the relevant academic literature and argues that a number of factors – such as the “anchor” currency, the invoicing currency of international trade, the currency in which foreign debt is denominated and the diversification strategies of central banks – help to explain the currency composition of foreign exchange reserves.

### The historical perspective

History suggests that, although there is great inertia associated with the dominant international reserve currency, changes do occur, albeit infrequently.<sup>2</sup> The pound sterling, for instance, was the main international reserve currency for more than a century, before being replaced by the dollar. Interestingly, for some time both currencies were of equal importance. Historical studies suggest that the main factors contributing to the dominance of a currency in global foreign exchange reserves have been openness to international trade, asset market liquidity and geopolitical power. For example, the pound sterling’s dominant role in international reserves came after the Industrial Revolution when the United Kingdom established itself as an imperial power, while the US dollar assumed ascendancy after the British economy weakened and the United States emerged as the most powerful country in the world in geopolitical terms.

### Applied and econometric studies

Most applied studies are based on regressions of aggregate currency shares in global foreign exchange reserves with a known currency composition on various characteristics of the home country of the respective currency, such as inflation, exchange rate volatility, trade openness, GDP, etc. They suggest that there is a high degree of inertia associated with the currency composition of foreign exchange reserves, since the lagged dependent variable is the most significant predictor of the reserve composition.<sup>3</sup> Yet this leaves unanswered the question of what economic driving forces are behind such persistence. Another line of research uses (confidential) country-specific data on the shares of the major international currencies in global reserve holdings.<sup>4</sup> Keeping in mind that some major reserve accumulators – most notably those in Asia – are not included in the data, the analysis suggests that a country’s “anchor” currency, the direction of its trade and the currency in which its foreign debt is denominated can explain much of the currency composition of its foreign exchange reserves. Since these factors are highly persistent over time, these research findings offer some explanation for the high level of inertia associated with the currency composition of reserves.<sup>5</sup> More recently, Truman and Wong (2006), using the IMF’s COFER database as well as published country data on the currency composition of reserves, have suggested that it is useful to distinguish between various types of “reserve diversification”. The authors conclude that concerns about “active reserve diversification” – where a central bank rebalances its reserve portfolio by buying or selling assets – are exaggerated. They also present some preliminary evidence on “passive diversification” – where the currency composition of a central bank’s reserve portfolio changes passively due to valuation effects. In addition, the authors suggest that the currency composition

1 For an overview and detailed analysis of recent trends in reserve accumulation, see the report entitled “The accumulation of foreign reserves” by the International Relations Committee Task Force (2006), ECB Occasional paper No 43.

2 See Knight, M. (2007) and Truman, E. M. and A. Wong (2006). Hartmann, P. (1998) provides a thorough review.

3 See Chinn, M. and J. Frankel (2005).

4 This confidential country-specific information from the IMF’s COFER database was only made available to the authors of the research.

5 See for example Dooley, M.P., S. Lizondo, and D. Mathieson (1989). See also Eichengreen, B. and D. Mathieson (2000).

of foreign exchange reserves held by industrial countries (most notably Japan) was characterised in 1999 and 2004 by “stabilising interventions” in which central banks intervened against market exchange rate trends.

### Survey-based studies

Central banks are becoming more transparent in their asset management strategies, which is reflected in a series of recent publications on central bank reserve management (e.g. Bernadell et al. (2004)) and surveys on determinants and behaviours relating to central bank reserve management (Pringle and Carver (2003, 2005) and Carver (2007)). According to these surveys, the accumulation of large foreign reserves increases the opportunity costs of holding reserves<sup>6</sup> and consequently prompts money managers to pursue more active portfolio management strategies. However, many constraints remain in place, which may offer a further explanation for why the currency composition of foreign reserves changes so slowly. Central banks, for example, appear keen to hold a sizable portion of their assets in the currency in which their country’s external debt and main trade patterns are denominated. In addition, although some central banks have started to consider investing in more risky assets, such as corporate bonds and equity, most have a preference for highly liquid government securities.

### Optimal currency allocations as a benchmark

To gauge the impact that changes in the investment strategies of central banks might have on the currency composition of foreign exchange reserves, some studies aim to quantify the diversification benefits that central banks forego by keeping the bulk of their reserves in short-term US dollar assets. Papaioannou, Portes, and Siourounis (2006) have developed a dynamic mean-variance currency portfolio optimisation model with rebalancing costs to obtain the optimal currency composition of a representative central bank’s reserves for the years surrounding the introduction of the euro.<sup>7</sup> Assuming certain dynamics for first and second moments of currency returns, they derive the optimal allocations and then compare them with the aggregate currency shares as reported in the IMF’s COFER database. According to these computations, the euro share is higher than the suggested optimal allocation. The authors also perform some simple simulations of the optimal currency allocations of four large emerging market countries, incorporating into the optimisation framework constraints that capture central banks’ desire to hold a sizable portion of their portfolios in the currency that is predominant in terms of their anchor currency, their foreign debt and their international trade. The analysis yields some interesting findings. First, as is already documented in the finance literature, the mean-variance optimisation yields unstable results. This may explain the high level of inertia associated with reserve holdings and central banks’ prudent reserve management strategies. Second, when the US dollar is used as the base currency (the risk-free asset), the currency optimisation model can replicate the dollar allocation in official reserve holdings as reported in the IMF’s COFER database. Given that most central banks outside the EU neighbouring regions express their currency returns in dollar terms, the high dollar share does not come as a surprise. The fact that the choice of reference currency is a key determinant of the model’s results raises the question of what factors determine the choice of the reference currency. In countries with a managed or fixed exchange rate regime, the base currency is typically the

<sup>6</sup> Opportunity costs stemming from not investing in higher-yielding assets must be distinguished from sterilisation costs which can arise if the yields paid on domestic sterilisation instruments exceed those on foreign assets.

<sup>7</sup> See also Fisher, S.J. and M.C. Lie (2004).

currency to which a country's own currency is pegged. This suggests that changes in the currency composition of foreign exchange reserves might occur if countries move away from managing their exchange rates with respect to the US dollar and adopt euro-based anchors or basket pegs in which the euro has a significant weight (as for example in the case of Russia).<sup>8</sup> Third, the mean-variance optimisation framework yields roughly equal allocations of the four reference currencies used besides the US dollar (the pound sterling, the Japanese yen, the euro, and the Swiss franc). Fourth, quantitatively the constraints reflecting the currency of a country's external debt and international trade have little influence compared with the constraint reflecting the reference currency on the currency composition of reserves. All in all, the analysis suggests that the choice of currency peg, the invoicing currency of international trade and the currency in which foreign debt is denominated appear to be the key factors determining the currency composition of a country's foreign exchange reserves. The choice of reference currency, however, appears to be the most important factor in quantitative terms.

<sup>8</sup> Changes to the currency composition of reserves could also occur if countries which currently peg their currencies to the US dollar were to switch to a freely floating exchange rate in combination with inflation targeting.

#### Box 6

##### THE EURO SHARE IN CENTRAL BANK DEPOSITS HELD AT BIS REPORTING BANKS

The locational international banking statistics compiled by the BIS include information on the currency composition of deposits held by central banks at BIS reporting banks. Thus, they represent a second piece of evidence on developments in the currency composition of foreign exchange reserves. However, as pointed out by Galati and Wooldridge (2006) and Wooldridge (2006), the data capture only a small and declining share of total reserve holdings, as they cover only one financial instrument – namely central bank deposits – that central banks use to hold their foreign exchange reserves. For example, holdings of securities, such as US Treasuries, are not included. In fact, according to Galati and Wooldridge (2006, p. 6), deposits held by central banks at BIS reporting banks fell from almost 50% of total reserve holdings in 1980 to about 23% in the late 1990s, before recovering to stand at around 30% in March 2006.

Compared with the IMF's COFER data, the BIS data have an advantage in terms of country coverage as they seem to include the deposit holdings of all countries' central banks, including those of major reserve accumulators, held with BIS banks. In general, developing countries allocate a substantial proportion of their reserves to deposits. One exception is China, as only a small proportion of Chinese reserves appear to be deposited with BIS reporting banks (Wooldridge 2006, p. 31).

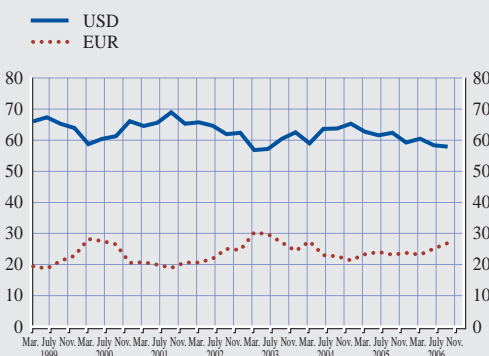
In addition to this limitation in terms of instrument coverage, it should be noted that the liabilities of BIS reporting banks to central banks also include some instruments that are usually not classified as reserves (Wooldridge, 2006, p. 29). Moreover, the BIS definition of monetary authorities excludes treasuries and government agencies. As a consequence, reserves held by the Japanese Ministry of Finance and the Chinese State Administration of Foreign Exchange are not covered by the data.

Overall, it cannot be assumed that the currency composition of central banks' deposits is representative of the currency composition of reserve holdings in other financial instruments. Thus, the BIS data – like the IMF data – should be treated with caution. In particular, currency share changes in central bank deposits should not be interpreted as evidence of trends in total reserve holdings.

Bearing these caveats in mind, the chart below shows that the euro share of central banks' deposits at BIS reporting banks is similar to the level reported by the IMF's COFER data. Measured at current exchange rates, the euro share increased from 24.7% in June 2005 to 28.5% in September 2006. Measured at constant exchange rates, it increased more moderately, from 24.1% to 26.9%, in the same period. Moreover, there has been some correlation between BIS and IMF COFER data, although the BIS data is somewhat more volatile.

**Currency composition of deposits of official monetary authorities held at BIS reporting banks**

(percentages, at constant Q1 1994 exchange rates)



Sources: BIS and ECB calculations.

**1.3 THE EURO AS AN INTERVENTION CURRENCY**

The functions of anchor, reserve and intervention currency are intricately intertwined. Under a floating regime, foreign exchange market interventions are infrequent, as they are mainly conducted to calm disorderly market conditions. By contrast, countries operating any form of exchange rate peg and managed float intervene regularly to achieve an exchange rate consistent with the chosen regime. In conducting interventions, they prefer to use the anchor currency.

As in the case of reserves, most authorities do not publish the currency composition of interventions. Press reports, publicly available data and statements by authorities indicate that several central banks of the new non-euro area EU Member States, some of which have joined ERM II (e.g. Slovakia), have used the euro as an intervention currency. Moreover, interventions in euro were conducted by authorities of countries operating a euro-based currency board. Several central banks in EU

neighbouring countries which use the euro as a point of reference for their exchange rate policies, like Croatia or Serbia, have also used the euro as an intervention currency. Public statements by the Bank of Russia suggest that it has continued to intervene in the rouble/euro market, albeit on a substantially smaller scale than in the rouble/dollar market.

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

*During the review period the stock of euro banknotes held outside the euro area, approximated by net shipments by euro area banks to destinations outside the euro area, has continued to gradually increase although the size of such net shipment flows has started to decline. Turning to the use of euro-denominated deposits in euro area neighbouring regions, survey data suggest that the euro share in total and foreign exchange deposits has increased in most non-euro area EU Member States and EU candidate countries.*

Residents of many developing, emerging market and transition economies hold a significant share of their financial assets in the form of foreign currency-denominated assets, mostly as cash or foreign currency-denominated bank deposits. Holdings of euro banknotes and euro-denominated deposits outside the euro area can be considered one of the facets of the international role of the euro, in particular in the euro area neighbourhood. This section provides updated information on the level of euro-based currency substitution (subsection 2.1) and asset substitution (subsection 2.2) observed in these countries.

### 2.1 CURRENCY SUBSTITUTION – THE USE OF EURO BANKNOTES OUTSIDE THE EURO AREA

At the end of 2006 the value of US dollar banknotes in circulation was comparable to the value of euro banknotes in circulation. This, however, does not indicate that the levels of foreign demand for these banknotes were similar (see Box 7). Given that holders of banknotes cannot be identified directly, information on non-resident demand for euro banknotes can only be derived indirectly and with a considerable amount of uncertainty.<sup>41</sup>

<sup>41</sup> For a more complete overview of the methods used to estimate non-resident demand for euro banknotes, see Boxes 7 and 8 in the “Review of the international role of the euro” published in January 2005.

#### Box 7

#### EURO AND DOLLAR BANKNOTE HOLDINGS OF NON-RESIDENTS

The US dollar and the euro are not only the two most important reserve currencies worldwide, but their banknotes circulate in a large number of countries outside their respective currency areas. The stability of these currencies and the wide acceptance of these banknotes make them popular in many developing, emerging market and transition economies as a medium of exchange and as a store of value, in particular in times of crisis as a hedge against domestic currency devaluations, for the settlement of cross-border trade or where domestic banking sectors and/or currencies are unstable.

Direct evidence on currency holdings, and thus foreign demand for banknotes, is difficult to obtain for the same reason that banknotes are popular, namely their anonymity. The holder of banknotes is, in general, unknown. Banknotes can easily cross borders without detection and are the most convenient way to make payments and settlements between two persons without the involvement of a third party. Therefore, in large part, information on the holders of banknotes can only be derived using indirect methods.

This box briefly describes some key facts about US dollar and euro banknotes and reviews recent estimates concerning their circulation outside their respective currency areas.

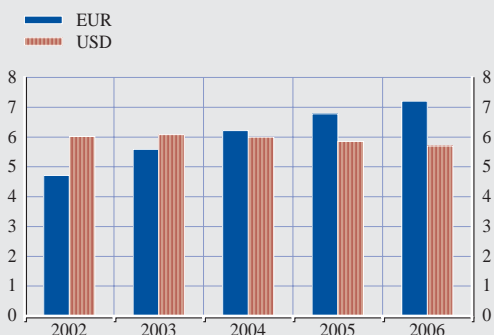
### Recent developments in US dollar and euro banknote holdings

Four key facts summarise the developments in US dollar and euro banknotes over the past five years:

- Since 2002 the ratio of euro banknotes in circulation to euro area nominal GDP has followed a continuous upward trend and is now higher than the equivalent ratio for the United States (see Chart A).
- The value of euro banknotes in circulation has increased more strongly in the past five years than the value of US dollar banknotes in circulation. In early 2002 the ratio of the outstanding amount of US dollar banknotes to euro banknotes was around 3.1, dropping to around 1.8 at

**Chart A Ratio of banknotes in circulation to domestic GDP**

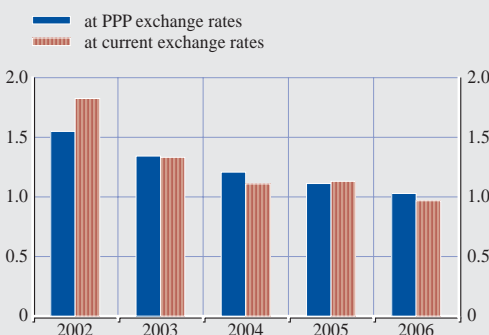
(percentages)



Note: Banknote figures are end-of-year figures.

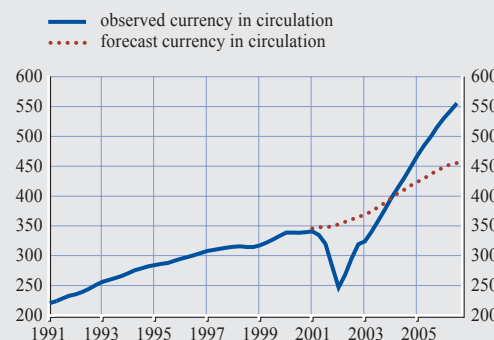
**Chart B Ratio of US dollar banknotes in circulation to euro banknotes in circulation**

(end-of-year figures)



**Chart C Forecast of currency in circulation <sup>1)</sup>**

(levels in EUR billions)

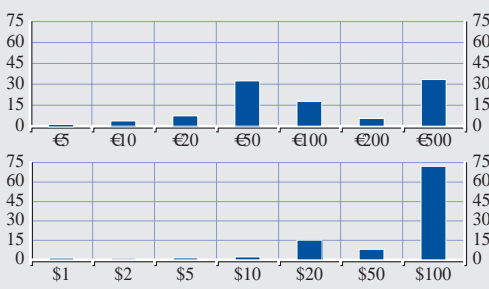


Sources: ECB, Federal Reserve System and ECB calculations.

1) Currency in circulation comprises banknotes and coins in circulation except those held by domestic Monetary Financial Institutions in their vaults. Currency was used instead of banknotes due to the availability of historical data. Data before 2002 refer to euro legacy currencies, data for 2002 refer to euro banknotes and coins in the hands of non-MFIs and in addition euro legacy banknotes and coins that had not been returned to the euro area banking sector. From 2003 onwards, currency in circulation data refer to euro banknotes and coins outside the euro area MFI sector.

**Chart D Shares of different denominations in the overall value of banknotes in circulation**

(percentages, December 2006)



the end of the same year. By the end of 2006 parity had been reached in both the current and the purchasing power parity (PPP) exchange rates (see Chart B).

- The introduction of euro banknotes has triggered a demand that goes well beyond what could have been expected on the basis of the demand for euro legacy banknotes prior to the cash changeover. At end-2006 the observed demand for euro banknotes was about €100 billion more than a forecast based on historical relationships estimated over the period 1990-2001 for euro legacy banknotes (see Chart C).<sup>1</sup>
- For both the US dollar and the euro, high denomination banknotes make up most of the value of banknotes in circulation (see Chart D). In particular, for US dollar banknotes, around three-quarters of the value of banknotes in circulation consists of USD 100 banknotes.

#### What do the data reveal about the use of US dollar and euro banknotes by non-residents?

Against the background of these developments, a naïve approach might lead to the conclusion that euro banknotes have a similar importance to US dollar banknotes as regards non-resident holdings. However, such an approach would assume that the importance of banknotes in the respective domestic areas is comparable. This is not supported by the available information.

First, the use of banknotes for daily transactions differs considerably between the United States and the euro area with regard to denomination. Whereas the USD 20 banknote is by far the most common denomination withdrawn from ATMs in the United States, the (higher value) €50 banknote is the most common denomination in a large number of euro area countries. A similar picture emerges when comparing cash withdrawals from ATMs in the euro area and the United States. Statistics for 2003 suggest that whereas the number of ATM cash withdrawals per capita and per year for the United States and the euro area are roughly comparable, the size of a single withdrawal is about 50% or 60% higher on average in the euro area (depending on whether current or PPP exchange rates are used). Furthermore, while the total value of ATM cash withdrawals in the euro area in 2003-2005 exceeded the value of card payments, in the United States ATM withdrawals in 2003 amounted to only one-quarter of the value of card payments.<sup>2</sup>

Second, the availability of high-denomination €200 and €500 banknotes – denominations that are not available in US dollar banknotes – suggests that payment habits with regard to large-value transactions and the use of banknotes as a store of value differ between the two currency areas. Indeed, anecdotal evidence points to a considerable increase in domestic demand for high-denomination euro banknotes not available from ATMs, in particular the €500 banknotes, since 2002. The availability of high-denomination banknotes in all euro area countries, coupled with the low level of interest rates and low and stable inflation expectations, which are at least comparable with those that existed in the most stable euro area countries prior to the introduction of the euro, have created an environment conducive to a change in holding behaviour within

1 These estimates are based on a currency demand model for euro legacy currencies estimated for the period 1980-2000 and extended by using the observed values of the main determinants of currency demand. For details of the model, see Fischer, B., P. Köhler, and F. Seitz (2004).

2 These figures for the United States can be derived from the Red Book of the BIS (statistical update of November 2006). For the euro area, figures can be derived from the Blue Book, Addendum 2006, published by the ECB. These statistics can only be seen as rough indications, as they are not necessarily fully comparable.

the euro area. The re-optimisation of currency holdings following the euro cash changeover has led to a considerable increase in the importance of euro banknotes as a store of value and as a means of payment for large-value transactions.

### Quantitative evidence for non-resident demand for US dollar banknotes and euro banknotes

Since 2001 the United States Treasury Department has published three reports that studied in detail the use and counterfeiting of US dollar banknotes abroad. The latest report was issued in September 2006.<sup>3</sup> Among other information, it presented an estimate of the value of US dollar banknotes circulating abroad based on a large number of estimation methods, both direct and indirect. Using information from across this set of methods, the report suggests that around USD 450 billion in banknotes was circulating outside the United States at the end of 2005, i.e. about 60% of the total value of US dollar banknotes in circulation.

Due to the euro's short history, such detailed estimation methods for non-resident demand are not available for euro banknotes. Moreover, given the major re-optimisation of banknote holdings within the euro area following the introduction of euro banknotes and coins in 2002, a number of indirect estimation methods used by the US authorities cannot currently be applied to the euro.<sup>4</sup> However, based on information about net shipments of euro banknotes via euro area MFIs to the rest of the world, one can derive what should be seen as a lower bound estimate for the value of euro banknotes circulating abroad (see also section 2.1 of the main text). Constructing such an estimate is possible since the starting value (for December 2001) of euro banknotes circulating abroad is known via the frontloading statistics. Furthermore, in the first few years of the existence of euro banknotes, the banking channel has very likely been the main channel for transporting banknotes to countries outside the euro area. However, over time, other channels (for example tourism, workers' remittances and small scale business) are likely to increase in importance, in particular where the outflow of banknotes is concerned. This is why the cumulated statistics on net shipments of euro banknotes to the rest of the world via MFIs should be considered to be a lower bound. These statistics suggest that the value of euro banknotes circulating abroad as at late 2006 was about €60 billion. Using various alternative estimation techniques, one can conclude that the true value of euro banknotes held by non-residents might be around €100 billion.

These estimates of non-resident demand for US dollar and euro banknotes considerably alter the picture of per capita banknote holdings in the United States and the euro area. At the end of 2005, if non-residents' holdings are not accounted for, it would appear that the value of the average per capita banknote holding in the United States was more than €2,100<sup>5</sup>, compared with €1,800 per capita in the euro area. However, when estimates of non-resident holdings as described above are taken into account, per capita banknote holdings valued at around €870 are calculated for the United States, and holdings of slightly more than €1,600 are calculated for the euro area for the same period. These figures are more in line with reported domestic ATM statistics and the greater importance of banknotes in the euro area than in the United States as both a means of payment and a store of value.

<sup>3</sup> See United States Treasury (2006), Part 3.

<sup>4</sup> See ECB (2005a), Boxes 7 and 8.

<sup>5</sup> This value stays in a relatively small range regardless of whether the PPP exchange rate or the current exchange rate is used.



## Conclusions

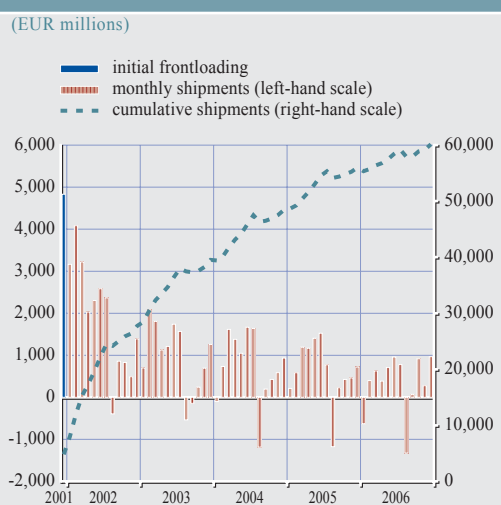
At the end of 2006 the value of US dollar banknotes in circulation was comparable to the value of euro banknotes in circulation. This, however, does not indicate that the levels of non-resident demand for the banknotes of the two currencies were similar. Partly as a result of the long history of the US dollar as an international currency and the short history of the euro, the former remains of considerably greater importance as a medium of exchange and store of value outside its currency area. Recent estimates suggest that the value of US dollar banknotes circulating outside the United States is about four to six times greater than the value of non-resident holdings of euro banknotes. As the overall value of banknotes in circulation in both currency areas is similar, this suggests that euro banknotes are considerably more important as a domestic medium of exchange and store of value, which is supported by a large number of other statistics. At the same time, the strong dynamics in the demand for euro banknotes call for careful monitoring, as the catching-up process of euro banknotes, domestically and abroad, does not seem to have come to an end even five years after their introduction.

One way of estimating the amount of euro banknotes circulating abroad is to total over time net shipments of euro banknotes by euro area MFIs to destinations outside the euro area.<sup>42</sup> Since the relatively large shipments observed as a result of the euro cash changeover, shipments of euro banknotes by banks to destinations outside the euro area have started to stabilise and appear to exhibit an increasingly seasonal pattern (see Chart 11).<sup>43</sup> As net shipments are

mostly positive, the stock of euro banknotes accumulated outside the euro area continues to increase gradually. In the review period between July 2005 and December 2006 net shipments of euro banknotes to destinations outside the euro area amounted to €5.6 billion.<sup>44</sup> A comparison of net shipments between July 2005 and June 2006 – amounting to €3.9 billion – with net shipments during the last review period from July 2004 to June 2005 (€8.7 billion) and the trend visible in Chart 11 suggests that net shipments have started to decline. As a result, while cumulative net shipments of euro banknotes are increasing, growth rates have been gradually declining over time. In December 2006 the cumulative stock of euro banknotes shipped in net terms by euro area MFIs to destinations outside the euro area stood at around €60 billion, compared with €55 billion in June 2005.

The estimate based on net shipments must be considered as rough at best, since transfers of euro banknotes to and from the euro area also

**Chart 11 Net shipments<sup>1)</sup> of euro banknotes to destinations outside the euro area**



Source: Eurosystem.

1) Net shipments are calculated as euro banknotes sent abroad minus euro banknotes received from abroad.

42 Net shipments are defined as shipments of euro banknotes by euro area MFIs to destinations outside the euro area minus euro banknotes returned from outside the euro area to euro area MFIs.

43 The information was compiled in cooperation with the national central banks of the Eurosystem.

44 The order of magnitude of these estimates of the annual net outflow of euro banknotes (less than €4 billion from July 2005 to June 2006) indicates that the impact of non-resident demand for euro banknotes on the annual growth rates of euro area monetary aggregates in the past year has been negligible.

take place through other channels, such as tourism, workers' remittances or activity in the grey economy. It must also be considered a lower bound estimate, as anecdotal evidence suggests that the outflows of euro banknotes via non-MFI channels can often be greater than the backflow of euro banknotes via non-bank channels (see also Box 7).

**Box 8****THE EURO IN CENTRAL, EASTERN AND SOUTH-EASTERN EUROPE – SURVEY RESULTS**

Surveys conducted by the Oesterreichische Nationalbank<sup>1</sup> (OeNB) in Croatia, the Czech Republic, Hungary, Slovakia and Slovenia since 1997 reveal important information about the role of foreign cash holdings and foreign currency loans in these countries.

The chart below shows the evolution of the proportion of survey respondents who have euro and/or US dollar holdings. Despite some short-run fluctuations, it is obvious that the number of people with euro holdings has trended upwards over the years in Croatia, the Czech Republic, Hungary and Slovakia. In Slovenia, where the number of people with euro holdings has been highest in absolute terms, a decrease is observed in autumn 2006. At that time, about 41% of residents in Slovenia, 31% of residents in the Czech Republic, 30% of residents in Slovakia, 25% of residents in Croatia and 7% of residents in Hungary had euro holdings.

A much smaller proportion of respondents have US dollar holdings. Over time, this share has remained fairly constant.

An analysis of survey participants' responses regarding their reasons for holding euro reveals that keeping it as a general reserve remains the main reason for euro holdings in Croatia (where 78% of residents with euro holdings cited this as their main reason) and in Slovenia (52%). In the other countries, "spending abroad" was the main reason for holding euro.

Not surprisingly, the reasons cited are also reflected in the median amounts of euro held by survey participants. Residents in Croatia and Slovenia held the highest amounts of euro cash (€512 and €370 respectively, as an annual average in 2006) whereas the median amounts of euro held in the other countries surveyed were significantly lower (between €100 and €120).

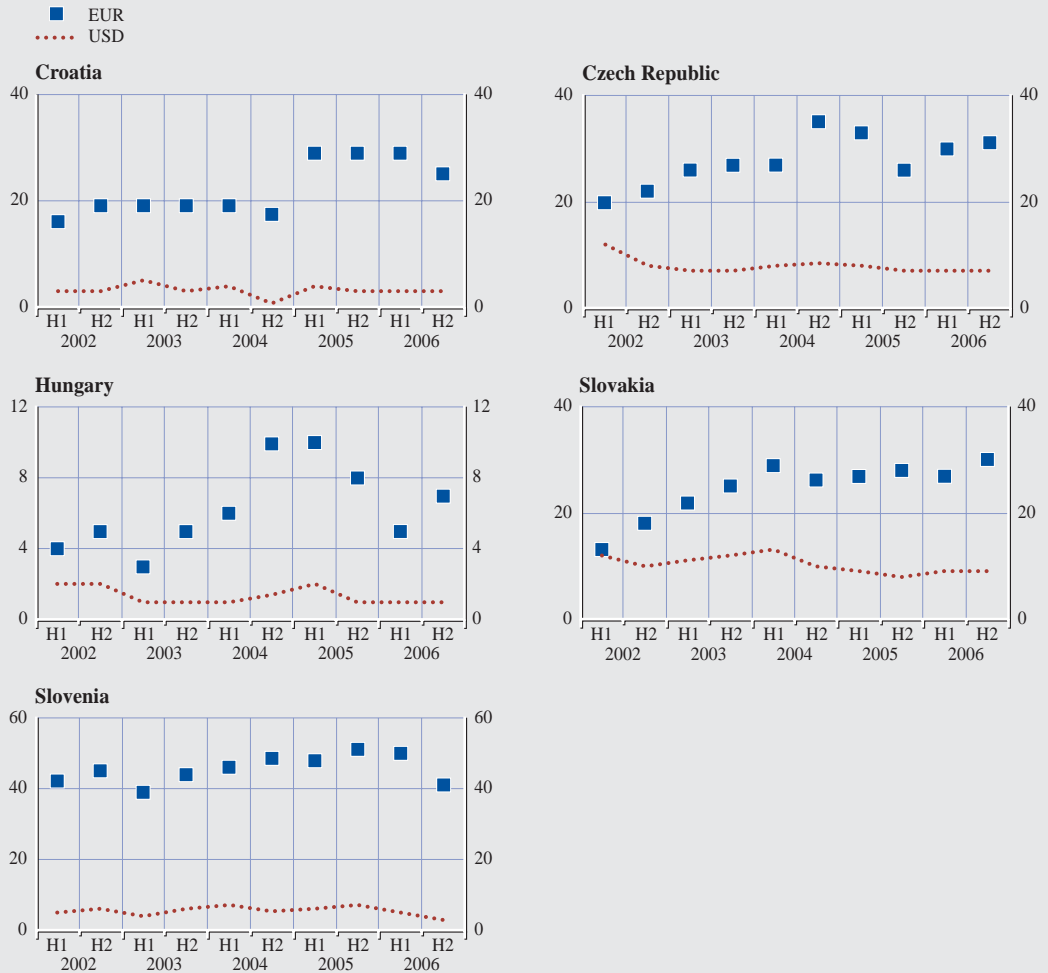
An upward trend over time can also be observed for the amounts of euro in circulation in all five countries surveyed. In comparison with the 1990s, demand for euro in the countries concerned was low at the end of 2001. Since then, survey estimates of the demand for euro indicate a steady increase of 75% from spring 2002 to spring 2006. As the number of people with cash holdings fell in Slovenia, so too did the amount of euro cash held by residents of Slovenia, which also declined in autumn 2006.

Moreover, survey respondents were asked whether they had made any payments in euro in their countries in the previous six months. In autumn 2006 16% of respondents residing in Slovenia and 9% of residents in Croatia answered that they had. In the other countries, the figure ranged from 3% to 6%. Over the period from 2005 to 2006, the share more than doubled in Slovenia and remained almost unchanged in Croatia.

<sup>1</sup> About 1,000 people over the age of 14 were interviewed for each survey and in each country every April/May and again every October/November. The surveys only cover private cash holdings. For more detailed results, see Ritzberger-Grünwald, D. and H. Stix, (2007).

## Foreign currency holdings

(percentages of respondents who have holdings)



Source: OeNB.

## 2.2 ASSET SUBSTITUTION – THE USE OF EURO-DENOMINATED BANK DEPOSITS

The euro cash changeover was accompanied in many euro area neighbouring countries by a large increase in euro-denominated deposits. This was probably related in part to a substitution of euro legacy currency banknotes with euro-denominated deposits. Following a period of slower growth for such deposits (see ECB, 2005b), during the review period the share of euro-denominated deposits increased in most new Member States and EU candidate countries

(see Table 19).<sup>45</sup> In addition, euro-denominated deposits increased in some countries in the Commonwealth of Independent States (CIS) and Africa. In the case of Moldova, strong links with Romania are likely to have contributed to

<sup>45</sup> Country-specific data should be interpreted with care as the methodologies used to compile the statistics might differ. As explained in more detail in earlier editions of this review, the share of euro-denominated deposits is particularly high in countries of the former Yugoslavia. This largely reflects the history of macroeconomic instability in the former Yugoslavia and the associated widespread circulation of euro legacy currencies, which were transformed into euro-denominated deposits at the time of the euro cash changeover.

**Table 19 Euro-denominated bank deposits in selected countries and dependent territories**

	Absolute amounts (EUR millions)			As a % of total deposits		As a % of foreign deposits	
	mid-2005	2006	as of	mid-2005	2006	mid-2005	2006
<b>New Member States</b>							
Bulgaria	2,615	4,526	Dec. 06	29.4	34.4	60.1	72.1
Cyprus	2,522	5,303	Dec. 06	9.3	14.3	25.6	33.3
Czech Republic	3,938	5,396	Dec. 06	6.3	7.3	64.7	68.1
Estonia <sup>2)</sup>	2,164	3,228	Dec. 06	31.9	33.0	70.8	73.0
Hungary	3,765	6,567	Jan. 07	10.6	15.8	70.5	75.6
Latvia <sup>2)</sup>	952	1,976	Dec. 06	23.7	29.7	59.3	73.7
Malta	1,348	1,341	Dec. 06	14.1	12.1	35.1	26.1
Poland	6,100	9,114	Dec. 06	7.2	8.3	48.4	57.0
Slovak Republic	4,622	5,501	Dec. 06	12.3	13.3	63.2	71.1
<b>Candidate countries</b>							
Croatia	10,599	12,833	Dec. 06	58.7	56.5	86.0	88.4
FYR Macedonia	607	812	Dec. 06	51.5	49.5	77.2	82.2
<b>Potential candidate countries and territories</b>							
Albania	606	1,008	Dec. 06	18.1	24.2	54.0	63.0
Bosnia and Herzegovina	1,403	1,769	Dec. 06	39.9	39.0	84.4	86.0
Kosovo <sup>1)</sup>	720	892	Dec. 06	96.4	96.3	96.4	96.3
Montenegro <sup>1)</sup>	337	1,025	Dec. 06	93.6	95.6	n.a.	n.a.
Serbia	2,390	4,286	Dec. 06	58.1	59.4	89.8	95.24
<b>European CIS</b>							
Moldova	111	226	Dec. 06	17.1	25.8	40.1	51.3
<b>Other countries in Europe</b>							
Sweden	40,582	40,094	Dec. 06	12.3	10.1	40.8	37.1
Switzerland	30,666	29,395	Dec. 06	8.6	8.9	42.7	40.7
UK	1,182,101	1,280,292	Dec. 06	24.5	22.5	n.a.	n.a.
<b>MENA</b>							
Israel	7,115	7,647	Nov. 06	6.3	6.6	20.0	20.3
<b>Sub-Saharan Africa</b>							
South Africa	377	681	Nov. 06	0.3	0.4	9.8	14.0

Sources: National central banks and ECB calculations.

Note: Data may be subject to revisions.

1) Unilateral euroisation.

2) Current figures may not be comparable with those of last years' review due to changes in definitions and possible revisions.

the rise in euro-denominated deposits. As regards mature economies, the share of euro-denominated deposits in total foreign deposits has declined in Israel, Sweden and Switzerland.

## SPECIAL FOCUS: ASSET SUBSTITUTION IN CENTRAL, EASTERN, AND SOUTH-EASTERN EUROPE – TRENDS AND DETERMINANTS

*This special focus aims to provide a survey of the degree of asset substitution in central, eastern and south-eastern Europe, with a particular emphasis on the use of the euro as a currency for local bank lending to households and firms. It has been prompted by the increasing use of the euro for domestic financial transactions in the region, as documented in previous editions of this review in the section on the private use of the euro in third countries.*

*The use of a foreign currency as a store of value has been attributed to past macroeconomic instability and high inflation. More recently, the volatility of inflation compared with that of the real exchange rate as well as weak governance have been identified as factors contributing to the use of foreign currency-denominated financial contracts and the inertia associated with this phenomenon. As regards the use of the euro in central, eastern and south-eastern Europe, several factors might have supported its role as the preferred currency for asset substitution, namely the geographical proximity of the EU – implying trade, financial, migration and tourism links – the institutional anchor of EU and EMU membership, and the role of the euro as an external anchor in countries' exchange rate policies. New empirical evidence indicates that the access to foreign funds which has accompanied the increasing presence of foreign banks, mainly from the euro area, has contributed to the rise in foreign currency lending in the region. By contrast, the share of foreign currency deposits in total deposits seems to be negatively affected by greater access of domestic banks to foreign funds. Finally, the analysis identifies interest rate differentials and the trade-off between the variability of inflation and that of the real exchange rate as factors that influence agents' decisions on whether to denominate loans and deposits in the domestic currency or a foreign currency.*

### I INTRODUCTION

The substantial use of a foreign currency in domestic bank lending and borrowing, including bank deposits, is a significant feature of a number of developing and emerging economies. Until a few years ago, this phenomenon was mainly linked to the US dollar, in particular in many Latin American countries, and to a limited extent to the Deutsche Mark in transition economies and, in particular, the former Yugoslavia. As has been documented in previous editions of this review, since its introduction the euro has been playing an important – often major – role in the domestic financial markets of the countries which have recently joined the EU, or which are candidates or potential candidates for EU membership. The purpose of this special focus is to study this phenomenon in central, eastern, and south-eastern European countries.<sup>46</sup>

The scope of the investigation is limited to identifying the factors driving the use of a foreign currency in the domestic deposit and loan markets of these countries.<sup>47</sup> In particular,

the analysis does not refer to cases of unilateral official adoption of a foreign currency as the national currency, i.e. unilateral official

<sup>46</sup> For the purposes of this special focus, the region of central, eastern and south-eastern Europe is deemed to comprise:

a) the central and eastern European countries that joined the European Union in 2004 and 2007, i.e. Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Latvia (LV), Lithuania (LT), Hungary (HU), Poland (PL), Romania (RO), Slovakia (SK) and Slovenia (SI); this group of countries is referred to as New Member States (NMS-10);

b) the countries formally recognised by the European Council to be candidates for EU entry, i.e. Croatia (HR), the Former Yugoslav Republic of Macedonia (MK) and Turkey (TR);

c) the countries formally recognised by the European Council to have an EU accession perspective (potential EU candidate countries), i.e. Albania (AL), Bosnia and Herzegovina (BA) and Serbia (CS).

Slovenia is included as the review period ends in 2006. On 1 January 2007 Slovenia joined the Economic and Monetary Union and officially adopted the euro as its legal tender. Malta and Cyprus are not included, as both countries have experienced different trends in financial market development, including the use of foreign currencies, compared with the other new Member States.

Montenegro, recognised as a sovereign state by the European Union in June 2006, has unilaterally adopted the euro as its legal tender and is thus not covered in the analysis.

<sup>47</sup> Cross-border lending and external bonded debt only plays a part when analysing the role of (foreign-owned) banks in funding domestic foreign currency-denominated loans (see sub-section 4).

euroisation/dollarisation.<sup>48</sup> As is well known, the ECB and the ECOFIN Council have emphasized in the past that they do not welcome unilateral euroisation, as an adoption of the euro outside the Treaty process would run counter to the underlying economic reasoning of European Monetary Union.<sup>49</sup>

Moreover, the term “asset substitution” is used, indicating that the focus of the analysis is on the private use of a foreign currency as a store of value, rather than as a medium of exchange (“currency substitution”). Finally, it is not intended to provide for a comprehensive overview of financial development trends in the region<sup>50</sup> or of the financial stability implications of the widespread use of foreign currency lending and deposits in the banking sectors in the region.<sup>51</sup> This holds in particular for exchange rate risks borne by unhedged borrowers, i.e. households, which could transform into credit risk by the lending banks.

The structure of this special focus is as follows. sub-section 2 briefly reviews the theoretical and empirical literature on determinants of asset substitution. Sub-section 3 provides some descriptive statistics on the extent of asset substitution in central, eastern and south-eastern Europe, including, when available, information on the euro share of total foreign currency deposits and loans. Sub-section 4 presents the findings of an ECB staff study which attempts to identify some specific features of the financial “euroisation” process in central, eastern and south-eastern Europe. Sub-section 5 concludes.

## **2 DETERMINANTS OF ASSET SUBSTITUTION: A REVIEW OF THE LITERATURE**

There is wide consensus in the literature that a past history of macroeconomic instability, particularly if characterised by episodes of hyperinflation, is one of the major factors leading to the widespread use of a foreign currency in a country’s domestic financial system. No country experiencing hyperinflation

has managed to escape, except by regulation, a significant increase in so-called deposit “dollarisation” (the term “dollarisation” is often used in the literature to refer to the use of any foreign currency; to avoid any confusion we will use below the terms “asset substitution” and “foreign currency lending”). Similarly, no country that has maintained inflation below a certain threshold, excluding some offshore financial centres, has a high proportion of deposits denominated in foreign currency (Honohan, 2007)<sup>52</sup>. Weak institutions, which may be indicative of the inability of the government to credibly commit to sound macroeconomic policies, may also contribute to a higher level of asset substitution (De Nicolò et al., 2005).

However, asset substitution has proved to be a very persistent phenomenon. Available longer-term time series show that the share of foreign currency deposits in total domestic deposits increased in several regions of the world, at least until 2001-2002. Since then, the share of deposits denominated in foreign currency has been decreasing in central, eastern and south-eastern Europe and in the Commonwealth of Independent States (CIS) and has remained fairly stable in the rest of the world (see Chart 12).<sup>53</sup> In central, eastern and south-eastern Europe, the peak came in 2001 and coincided with the euro cash changeover (see the next section), whereas in the CIS foreign currency deposits have been declining since 2002 after

48 A comprehensive review of all the main cases of unilateral and official dollarisation/euroisation, analysing motives, features and policy implications of this exchange rate regime has been provided by Winkler et al. 2004.

49 See ECOFIN (2000).

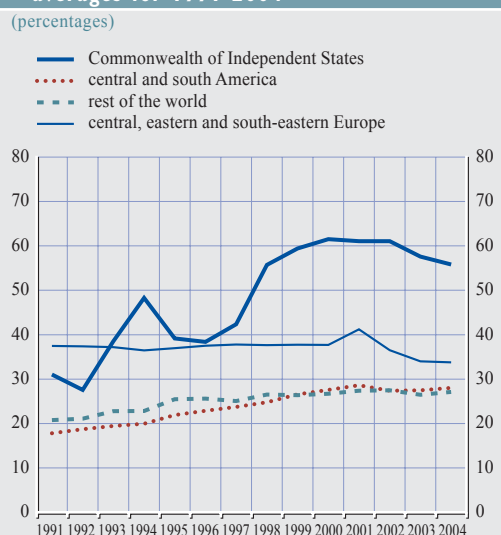
50 For such an overview, see for example Enoch and Ötler-Robe (2007).

51 “The exchange rate risk with respect to the euro persists in all countries before they adopt the euro, irrespective of the currency regime in place.” (ECB, 2006a, p. 103). See also ECB (2006b), in particular section 5. Baliño et al. (1999) and Armas et al. (2006) provide a general discussion of the policy implications of widespread asset substitution.

52 Honohan, P. (2007) identifies this threshold as an average annual inflation rate of 35%.

53 A peak in deposit dollarisation at the end of 2001 is also confirmed by the more detailed analysis of Honohan, P. (2007) for a balanced panel of 76 countries between 1995 and 2004.

**Chart 12 Deposits denominated in foreign currency as a proportion of total deposits – averages for 1991-2004**



Sources: IMF staff reports, central bank bulletins (various issues), Baliño et al. (1999), De Nicolò et al. (2003).  
Notes: Unweighted averages. Excluding Serbia.

having dramatically risen towards the end of the 1990s to a very high level of around 60% of total deposits.<sup>54</sup> In Latin America, the share of deposits denominated in foreign currency is on average lower than in transition economies, but displays an upward trend over the long term and very high level of inertia.<sup>55</sup>

The inertia associated with the use of a foreign currency as a store of value presents a puzzle, given the strong progress made in restoring monetary stability in many emerging economies, which somewhat weakens the traditional theory that explains asset substitution as the result of disorderly monetary conditions. Against this background, the literature on the determinants of the use of a foreign currency in domestic deposits and loans has put forward a number of explanations for this phenomenon, offering three theoretical paradigms to explain why agents choose to borrow or lend in a foreign currency rather than their home currency: i) the portfolio view; ii) the market failure (or credit risk) view; and iii) the institutional view (see Levy-Yeyati, 2006). The portfolio approach and the market failure approach look at asset substitution from two different angles: the point

of view of the lender (e.g. households) and that of the ultimate borrower (e.g. firms) respectively. By contrast, the institutional view explains asset substitution as the result of domestic market and legal imperfections, such as the existence of more efficient offshore intermediaries using only foreign currency-denominated loans and deposits or the presence of a lower liquidity risk in broader and deeper foreign currency markets. Mainly because of the lack of data and measurement problems, there is only scant evidence for the institutional view. For this reason, the following analysis focuses on the first two views.

The portfolio approach, as its name suggests, explains asset substitution as the result of a portfolio choice whereby risk-averse depositors minimise the variance of their portfolio returns in terms of the local consumption basket (hence, we will refer to this explanation as the “minimum variance portfolio theory”). Local and foreign currency assets are subject to two different types of risk: returns on local currency assets are uncertain due to domestic inflation while returns on foreign currency assets are uncertain due to the real exchange rate risk. It is assumed that uncovered interest rate parity applies. Thus, interest rate differentials reflect expected exchange rate movements and the mean returns on each currency are equal. As a result, the currency composition of the portfolio – i.e. the breakdown into local and foreign currency – depends on the volatility of inflation compared with the volatility of the real exchange rate. An increase in the volatility of inflation compared with that of the real exchange rate produces a portfolio shift towards the foreign currency and vice versa. By focussing on relative volatility, models based on the portfolio approach are able to explain the hysteresis in asset substitution, i.e. a high level of persistence in the use of a

54 It is worth noting that Chart 12 reports unweighted averages for regional groups. For example, in Russia, by far the largest of the CIS countries, the share of foreign currency deposits peaked at more than 40% in 1999 and then markedly declined in subsequent years.

55 Unweighted averages may mask significant outliers such as the “forced” de-dollarisation in Argentina following the 2001 crisis.

foreign currency in financial transactions even when the memory of past macroeconomic imbalances has faded away. Economic agents continue to use the foreign currency as a store of value if inflation is expected to be more volatile than the real exchange rate (Ize and Levy-Yeyati, 2003).<sup>56</sup>

The market failure, or credit risk, paradigm explains asset substitution as the result of optimal decisions by risk neutral agents in the presence of default risk and market failures, such as market frictions, asymmetric information and moral hazard. The main assumption is that any borrower aims to minimise the probability of default and avoid liquidation costs. These costs may arise for two reasons. First, higher interest rates on local currency loans compared with foreign currency loans (the so-called “peso premium” due to devaluation expectations) may produce an interest rate-induced default risk on local currency loans. Second, sharp depreciation of the domestic currency represents a currency-induced default risk on foreign currency loans. Faced with these scenarios, to minimise the probability of default borrowers might prefer foreign currency-denominated loans if a domestic currency depreciation is – ex ante – very unlikely, even if ex post costs in the event of devaluation may be very high due to soaring debt in local currency terms (Jeanne, 2003). This holds true in particular if formal or informal implicit guarantees – taking the form of exchange rate pegs or tightly managed floats, deposit insurance and expectations of a bail-out from the government – further reduce the likelihood of depreciation and/or decrease the ex post cost of default in the event of sharp depreciation.

Ize and Levy-Yeyati (2005) provide a survey of empirical evidence on the validity of these two paradigms. Overall, the evidence seems to confirm the portfolio view and also offers some indirect – albeit less robust – support for the market failure view. One of the most important findings is that the relative volatilities of inflation and the real exchange rate help to explain a significant part of the degree of asset

substitution, as predicted by the minimum variance portfolio theory. The importance of the relationship between inflation and the real exchange rate in explaining the use of foreign currencies in bank lending and deposits is also underlined by the finding that high exchange rate pass-through is positively associated with the degree of asset substitution. By contrast, past inflation or other indicators of (poor) macroeconomic performance are only loosely associated with asset substitution, once one takes into account the relative volatilities of inflation and the real exchange rate. Other variables, such as trade openness and the size of the economy, do not appear to influence the degree of asset substitution.

### **3 ASSET SUBSTITUTION IN CENTRAL, EASTERN AND SOUTH-EASTERN EUROPE: TRENDS AND DRIVING FORCES**

Residents in central, eastern and south-eastern European countries keep a significant amount of their total deposits and borrow a large proportion of their total credit in a currency other than their domestic currency.<sup>57</sup> On average, between 2000 and 2006 almost 40% of total deposits and around 52% of total loans in these countries were denominated in – or indexed to – a foreign currency. In the new Member States (NMS-10) and the potential candidate countries the share of foreign currency loans in total loans is on average higher than the corresponding share of foreign currency deposits, while this is not the case in

<sup>56</sup> In practice, the mean-variance portfolio theory derives an “expected” share of foreign currency deposits in total deposits, which is a function of the historical variances and covariance of inflation and real depreciation.

<sup>57</sup> All figures in this section are based on a unique dataset which has been compiled by ECB staff mainly on the basis of information provided by the various national central banks. The authors are grateful to the institutions which have cooperated in the creation of this dataset. Unless otherwise indicated, all data referring to foreign currency deposits or loans also include foreign currency-indexed deposits or loans. It should be noted that our data report a share of foreign currency deposits in total deposits in central, eastern and south-eastern Europe which is slightly higher than the share reported in Chart 12. This is because our data include Serbia, which is not included in Chart 12 that is based on a different dataset, and because our data include domestic currency deposits indexed to foreign currency in the aggregate.



**Table 20 Foreign currency deposits/loans as a share of total domestic deposits/loans – averages for 2000-2006**

(percentages)

	Deposits	Loans
Average for all countries	39.7	51.8
New Member States – 10	30.8	43.5
Candidate countries	61.2	57.3
Potential candidate countries	47.7	73.8

Sources: National central banks and ECB staff calculations.

Note: The data include foreign currency-indexed deposits and loans. In the cases of Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia there are no data on foreign currency-indexed loans before 2004 so the averages for loans refer to the period 2005-2006.

the candidate countries. Interestingly, the NMS-10 have on average the lowest share of foreign currency deposits in total deposits – around 31% – which may reflect greater confidence in their domestic currencies as a store of value than exists in candidate and potential candidate countries (see Table 20).

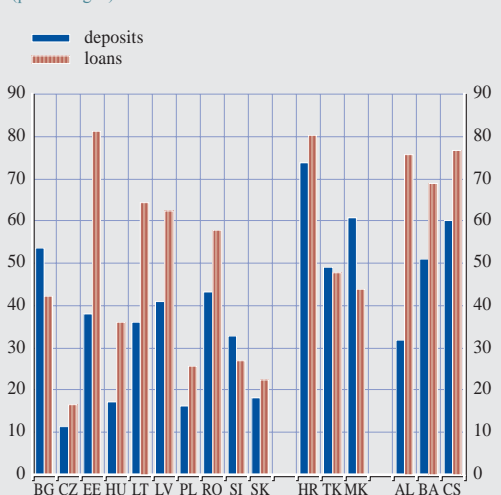
A closer look at the data reveals that the degree of asset substitution is lowest in the Czech Republic, with the foreign currency share in total deposits being slightly higher than 10%. By contrast, in Croatia, the former Yugoslav

Republic of Macedonia and Serbia more than 60% of total deposits are denominated in foreign currency. As regards loans, Croatia and Estonia show the highest level of asset substitution among central, eastern and south-eastern European countries, with around 80% of total loans denominated in foreign currency. Bulgaria and the former Yugoslav Republic of Macedonia are the only countries where the degree of asset substitution is significantly higher in the case of deposits than in the case of loans (see Chart 13).

Our dataset, which starts in 2000 and ends in 2006 for most of the countries covered, confirms the presence of hysteresis in asset substitution overall, with the foreign currency-denominated share of deposits and loans generally changing slowly, often irrespective of the success in restoring monetary stability in the large majority of countries in the region. In the NMS-10, the share of foreign currency deposits in total deposits has been drifting downwards since 2001, and evening out at around 29% as at end-2006. In the candidate and potential candidate countries, foreign currency deposits rose substantially towards the end of 2001 on the back of the euro cash changeover. This was particularly evident in Bosnia and Herzegovina and the former Yugoslav Republic of Macedonia. In order to boost confidence in their banking systems, authorities in south-eastern Europe encouraged households to deposit in the banks any legacy currency cash holdings formerly kept “under the mattress” rather than exchange them directly for new euro banknotes. Moreover, individuals who deposited their holdings in the

**Chart 13 Foreign currency deposits/loans as a share of total domestic deposits/loans – averages for 2000-2006**

(percentages)



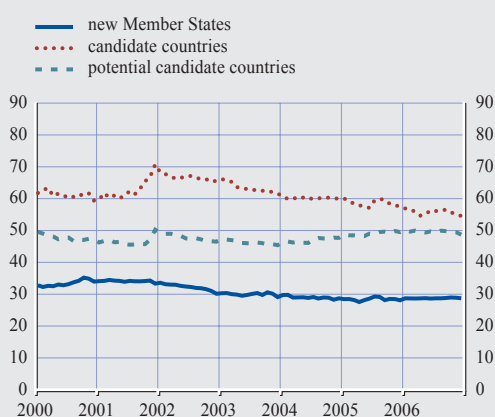
Sources: National central banks and ECB staff calculations.

Note: The data include foreign currency-indexed deposits and loans. In the cases of Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia there are no data on foreign currency-indexed loans before 2004 so the averages for loans refer to the period 2005-2006.

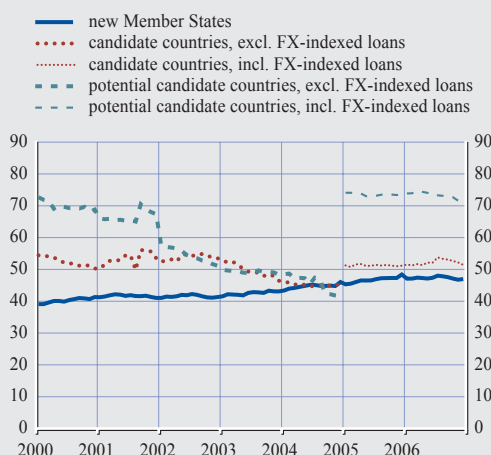
Chart 14 Trends in asset substitution since 2000

(percentages)

a) Foreign currency deposits as a share of total deposits



b) Foreign currency loans as a share of total loans



Sources: National central banks and ECB staff calculations.  
Notes: Unweighted averages.

local banks could minimise risks (e.g. of receiving counterfeits) and costs.<sup>58</sup> Since then, however, the share of foreign currency deposits in total deposits has declined in the region, partly – in some countries even completely – reversing the pick-up seen in 2002 (see Chart 14a). The more recent downward trend among the candidate countries is driven by Turkey, where the share of foreign currency deposits in total deposits declined from more than 60% in 2001 to about 40% at the end of 2006. It is worth noting that this is unrelated to the euro cash changeover and reflects instead the successful macroeconomic stabilisation after the financial and currency crisis in 2001.

Different trends can be observed in the use of foreign currency lending in the countries under review. In the NMS-10, the share of foreign currency-denominated loans has increased from 39% of total loans in 2000 to about 47% in 2006. As we discuss later, this trend reflects the large presence of foreign banks – mainly from the euro area – in the region, which have been supporting credit growth in the form of foreign currency lending, mainly denominated in euro.<sup>59</sup> Trends in candidate and potential candidate countries are more difficult to interpret since

time series including foreign exchange-indexed loans are only available from 2005 for Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia and Serbia. Until the end of 2004 foreign currency loans – excluding foreign currency-indexed loans – were in decline relative to domestic currency-denominated loans, in particular in potential candidate countries. However, new series, which include foreign currency-indexed lending since 2005, show that the share of foreign currency loans in total loans has been fairly stable at more than 70% in potential candidate countries and more than 50% in candidate countries (see Chart 14b). Among the candidate countries, the share of lending denominated in or linked to a foreign currency has increased in the former Yugoslav Republic of Macedonia, whereas it has markedly decreased in Turkey, possibly reflecting regulatory constraints on foreign currency lending to households in a context of strong household credit growth.<sup>60</sup>

58 See ECB (2002) for additional details.

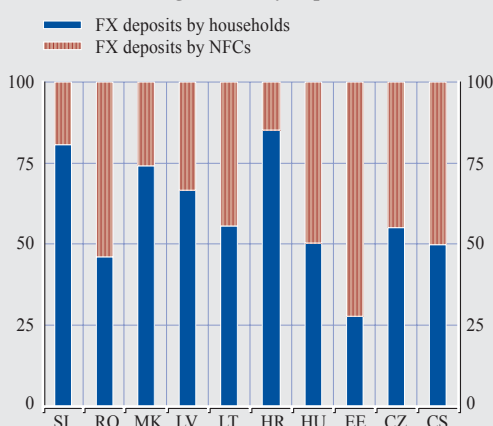
59 For details of the role of foreign banks in financial development in the region, see De Haas, R. and I. Lelyveld (2006a and 2006b) and Mehl, A. et al. (2006).

60 Domestic currency-indexed loans with a foreign currency clause are allowed but not widely used in Turkey.

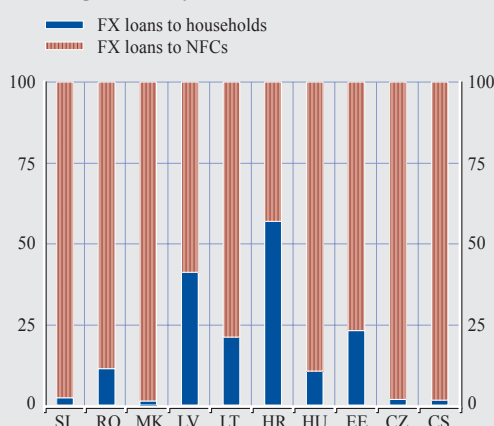
**Chart 15 Asset substitution. Households versus non-financial corporations – averages for 2000-2006**

(percentages)

**a) Share of foreign currency deposits by households/non-financial corporations (NFCs) over total foreign currency deposits**



**b) Share of foreign currency loans to households/non-financial corporations (NFCs) over total foreign currency loans**



Sources: National Central Banks and ECB staff calculations.

Notes: The data for Croatia refer to 2002, for Hungary and Latvia to 2003, and for Lithuania to 2004. The data include foreign currency-indexed deposits and loans.

Households account – on average – for most of the foreign currency deposits held in the banks of central, eastern and south-eastern Europe. Only in Romania and Estonia do non-financial corporations account for more than half of total foreign currency deposits, with an average share of 54% and 72% respectively (see Chart 15a). Available data on the maturity of deposits in eight countries indicate that around four-fifths of foreign currency deposits are short-term, with only two countries – Bosnia and Herzegovina and Romania – reporting a higher share of long-term foreign currency deposits than short-term deposits.<sup>61</sup>

Loans to non-financial corporations comprise the vast majority of total foreign currency loans, accounting for up to 85% of total foreign currency lending. However, in a few countries households borrow significantly in foreign currency as well – either for consumption purposes or for mortgages. Thus, the share of households in foreign currency lending ranges between 20% and 50% in the Baltic countries and Croatia (see Chart 15b). The duration of foreign currency loans is skewed towards long-term maturities. On average, over the period

2000-2006, more than two-thirds of total foreign currency loans were long-term loans in the seven countries that report such data.<sup>62</sup> Moreover, the share of long-term loans in foreign currency loans steadily increased in the period and reached three-fourths of total loans in 2006.

Data on the currency composition of foreign currency deposits and loans in central, eastern and south-eastern Europe indicate that the euro has a more prominent role than other foreign currencies. As at 2006 the average euro share in total foreign currency deposits in the region was 69%, ranging from a minimum of almost 40% in Turkey to more than 80% in Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia and Serbia (see Chart 16a).<sup>63</sup>

61 Data are available for Bosnia and Herzegovina, Bulgaria, Serbia and Montenegro, the Czech Republic, Estonia, Hungary, Romania and Slovenia.

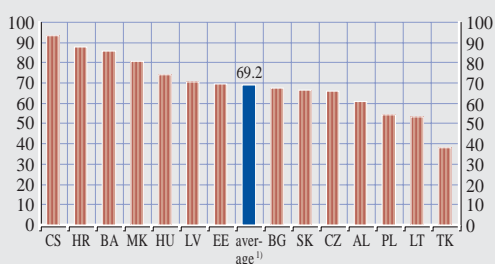
62 Data are available for Bulgaria, Serbia, the Czech Republic, Estonia, the former Yugoslav Republic of Macedonia, Romania and Slovenia.

63 The currency composition of foreign currency deposits is not available in the cases of Romania and Slovenia.

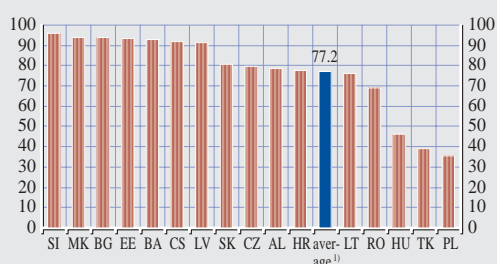
Chart 16 The role of the euro in foreign currency deposits and loans in 2006

(percentages)

a) Euro-denominated deposits: average shares in total foreign currency deposits



b) Euro-denominated loans: average shares in total foreign currency loans



Sources: National central banks, ECB (2006b) and ECB staff calculations.

Notes: The data include foreign currency-indexed deposits and loans. The data for Romania and Slovenia refer to end-2005.

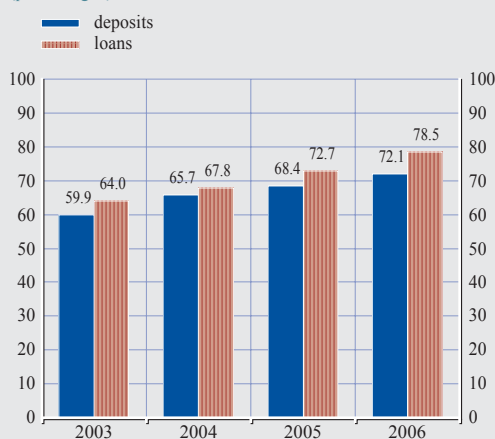
1) Unweighted average.

The euro also emerges as the main currency for foreign currency loans. According to the latest data, as at 2006 on average 77% of total foreign currency loans were denominated in – or indexed to – the euro. In almost half of the countries in the region – Bosnia and

Herzegovina, Bulgaria, Estonia, the former Yugoslav Republic of Macedonia, Latvia, Serbia and Slovenia – the euro is virtually the only currency in which foreign lending takes place, representing more than 90% of total foreign currency loans. Conversely, in Poland and Turkey the euro share in foreign currency loans is somewhat below 40% (see Chart 16b).

Chart 17 Trends in the private use of the euro in eleven selected countries<sup>1)</sup>

(percentages)



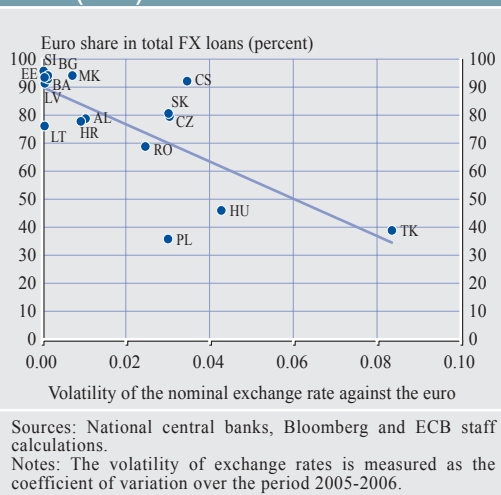
Sources: National central banks and ECB staff calculations.

Notes: Unweighted averages for Albania, Bosnia and Herzegovina, Croatia, the Czech Republic, Estonia, Hungary, Latvia, the former Yugoslav Republic of Macedonia, Serbia, Slovakia and Turkey. For Bosnia and Herzegovina, the data up to end-2004 do not include loans indexed to the euro. The data include foreign currency-indexed deposits and loans.

1) Euro-denominated deposits/loans as a share of total foreign currency deposits/loans – averages for 2003-2006.

In general, over the last few years the use of the euro in the domestic financial markets of central, eastern and south-eastern European countries has grown, displacing other foreign currencies. Evidence from a selected group of eleven countries in the region, for which it was possible to obtain sufficiently long and comparable time series, shows that the share of euro-denominated – or euro-indexed – deposits increased steadily from 60% of total foreign currency deposits in 2003 to 72% in 2006, while the share of euro-denominated loans went up from 64% of total foreign currency loans in 2003 to almost 80% in 2006 (see Chart 17). This upward trend in both euro-denominated deposits and loans is broad-based across the reporting countries, with the exception of Croatia where the share of euro-denominated loans in total foreign currency loans has been declining, albeit from high levels, and Hungary and Poland, where loans denominated in the

**Chart 18 The external anchor effect of the euro and its share in total foreign currency loans (2006)**



Swiss franc are very popular and have increased at the expense of euro-denominated loans<sup>64</sup>.

There are a number of possible explanations for the predominant role of the euro and its growing use in central, eastern and south-eastern Europe. The geographical proximity and close trade relationships of the countries in the region with the EU, which is their main trading partner, favour the euro compared with other foreign currencies. Participation in the EU enlargement process is an important institutional factor supporting the use of the euro. In due course, the new Member States of the EU are expected to join EMU and adopt the euro as the final step of the convergence process. Over a longer horizon, the same applies to candidate or potential candidate countries. The perception of the public regarding the possible date for the adoption of the euro may also have an influence on its use as a store of value. For instance, Slovenia had the largest share of foreign currency loans denominated in euro among the countries in the region in the months preceding the announced date of its official adoption of the euro, on 1 January 2007.

Other institutional features, such as the use of the euro as an anchor currency in the form of exchange rate pegs and tightly managed floats,

may play a role as well. It is interesting to note that in those countries in our sample that use the euro as an external anchor in the form of a currency board, a peg or a tightly managed float, such as the Baltic countries, Bulgaria, Croatia and the former Yugoslav Republic of Macedonia, the euro share in total foreign currency deposits and loans is above – or very close to – the average for all reporting countries. This “anchor” effect seems particularly strong in the case of loans, as suggested by the negative relationship between the share of euro loans in total foreign currency loans and the volatility of the nominal exchange rate against the euro as shown in Chart 18. Among the countries with a rigid peg to the euro, only Lithuania has a relatively low euro share in total foreign currency loans, whereas among those with more flexible exchange rate arrangements, only Serbia has a relatively high euro share.<sup>65</sup>

Finally, the penetration of foreign-owned banks in the domestic financial markets of central, eastern and south-eastern Europe, offering credit denominated in euro at interest rates that are lower than those available for credit in the domestic currency, is likely one of the main reasons for the trend increase in the use of the euro in local loan contracts. Recent evidence on asset substitution in central, eastern and south-eastern European countries suggests that banks, in particular subsidiaries of foreign-owned banks, have been promoting foreign currency lending in the region in an attempt to capture market shares in developing and highly profitable credit markets.<sup>66</sup>

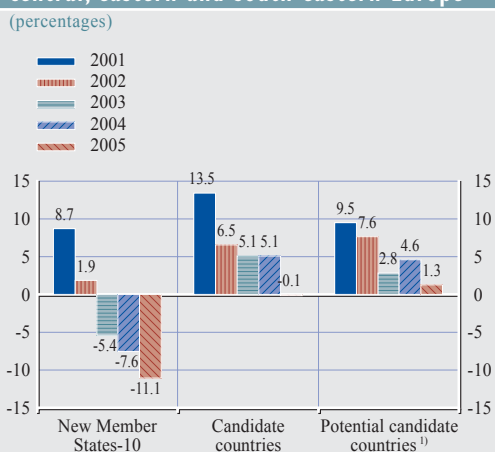
Foreign-owned banks and their subsidiaries have engaged in substantial borrowing from abroad, often from their parent banks in the

64 In Poland, credit lines denominated in the Swiss franc are very popular and represented around half of total foreign currency loans at the end of 2005. The use of the Swiss franc is also widespread in Hungary, and accounted for around 40% of total foreign currency loans at the end of 2005, which explains the euro’s relatively small share of foreign currency loans in these countries (see ECB, 2006b).

65 See section B.1 on the use of the euro as an anchor currency for more details.

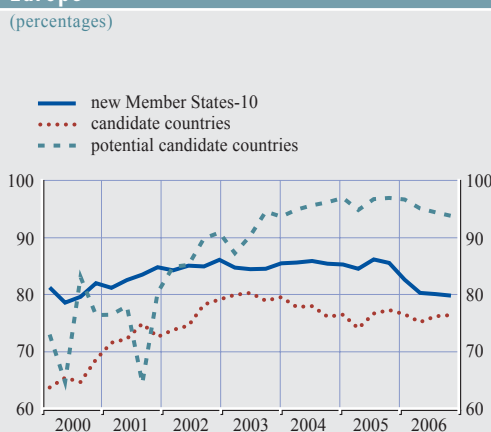
66 See also ECB (2006a).

**Chart 19 Net foreign assets as a share of the total assets of the banking sector in central, eastern and south-eastern Europe**



Sources: IMF and ECB calculations.  
Notes: The data refer to deposit money banks as reported by IFS. Unweighted averages.  
1) Excluding Serbia.

**Chart 20 Foreign claims of BIS-reporting banks in central, eastern and south-eastern Europe<sup>1)</sup>**



Sources: BIS and ECB staff calculations.  
1) Claims of banks headquartered in the euro area as a share of total reported claims.

euro area, in order to finance new credit lines. As a result, the net foreign positions of the banking sector have substantially decreased. The NMS-10 in particular shifted from a positive foreign asset position to a negative one in just a few years and had accumulated net foreign liabilities equal to about 11% of total banking assets as at end-2005 (see Chart 19).<sup>67</sup> These foreign-owned banks are mainly from the countries of the euro area, or the EU, and control the majority of banking sector assets in all countries of the region, with the exception of Slovenia and Turkey. BIS locational statistics which report foreign claims of banks headquartered in 36 countries – mainly developed countries and banking centres – confirm the dominant role of euro area banks in the foreign borrowing of the countries in central, eastern and south-eastern Europe. According to the BIS data, these total foreign claims surged from an average of around USD 140 billion in 2000 to USD 660 billion in the third quarter of 2006 – an increase of almost 500% – of which USD 525 billion or around 80% are claims of banks headquartered in the euro area. In particular, more than three-quarters of total reported foreign claims in the NMS-10 and the candidate countries relate to banks

headquartered in the euro area. This share is even larger in the potential candidate countries, where banks headquartered in the euro area account for more than 90% of total foreign claims (see Chart 20).

As the banks are required to maintain net foreign exchange positions within certain prudential limits, the rise in banks' foreign liabilities has typically been matched by a rise in domestic loans denominated in foreign currency. In a context of benign liquidity conditions in the euro area, the cost of these funds to end-borrowers is lower than that of credit lines extended in domestic currencies, which may incorporate exchange rate risk premia. Indeed, Chart 21 shows that the differential between interest rates in a local currency and those in a foreign currency is generally positive for both deposits and loans. However, it is important to note two distinct features of the data. First, interest rate differentials on loans are larger than interest rate differentials on deposits in all reporting countries. This implies that lending-deposit

67 Baltzer, M. et al. (2006) provide an analysis of financial integration in the new EU Member States.

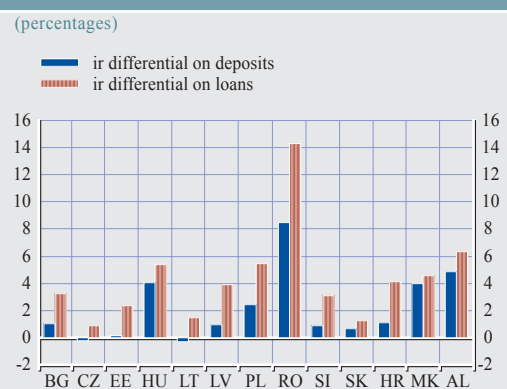
spreads in a domestic currency are higher than lending-deposit spreads in a foreign currency, indicating a higher degree of competition in the foreign currency segment of the market. Second, interest rate differentials between domestic and foreign currency loans are significant even in countries with rigid pegs or a track record of exchange rate stability, such as the Baltic countries, Bulgaria, Croatia and the former Yugoslav Republic of Macedonia, implying a residual exchange rate risk which cannot be eliminated and which raises the cost of borrowing in the domestic currency.

Summing up, the widespread use of foreign currency lending and deposits, in particular euro-denominated loans and deposits, may for the most part reflect the process of financial integration between the region and the euro area. However, this has so far not been studied in the literature on the determinants of asset substitution. A recent ECB staff study (see Basso, Calvo-Gonzalez and Jurgilas, 2007) attempted to integrate the peculiarities of the process of financial deepening through cross-border banking activities and financial euroisation in a formal theoretical setting, testing its implications in a large sample of countries.

#### 4 THE ROLE OF BANKS AND INTEREST RATES

One shortcoming of the existing literature on the determinants of asset substitution is that banks are regarded as intermediaries without any influence on the currency composition of loans and deposits or interest rates. As noted, the portfolio approach and the market failure approach look at asset substitution from two different angles: the point of view of the lender (the depositor) and that of the borrower, respectively. Ize (2005) presented for the first time a unified analytical framework which models depositors (households) and borrowers (firms) separately, thus merging the portfolio and market failure approaches in one model. Risk-averse depositors decide the currency composition of their deposits on the basis of the minimum variance portfolio choice paradigm, while risk-neutral firms choose the currency

**Chart 21 Interest rate (ir) differentials on deposits and loans – averages for 2002-2006**



Source: Basso, Calvo-Gonzalez and Jurgilas (2007).  
Notes: Interest rate differentials are calculated as local currency minus foreign currency rates. The data for Romania and Slovenia start in 2003; for the Czech Republic in 2004; for Hungary, Latvia, Slovakia and the former Yugoslav Republic of Macedonia in 2005.

composition of their borrowing in the light of default risk. The model is constructed in such a way that the equilibrium is defined as a point where depositors and borrowers choose the same currency composition. In this context, banks have no role in determining interest rates and the currency composition of deposits and loans.

However, as explained in the previous section, subsidiaries of foreign-owned banks in central, eastern and south-eastern Europe have taken advantage of their ownership structures which allow them easy access to foreign funding, thereby contributing to the growth of foreign currency-denominated loans. As a result, contrary to the implications of the model of Ize (2005), the share of foreign currency in loans may differ from the share in deposits. Against this background, Basso, Calvo-Gonzalez and Jurgilas (2007) designed a model that aims to accommodate the fact that the degree of asset substitution in deposits and loans may differ due to banks' foreign borrowing. More importantly, they allow for competition among banks to play a key role in driving foreign currency lending. Finally, they do not assume that uncovered interest rate parity applies, which implies that interest rate differentials between domestic and foreign currency deposits

and loans have an influence on the currency choice of depositors and borrowers. This is because, as indicated in the previous section, foreign currency loans tend to be subject to lower interest rates than domestic currency loans, while in many cases the exchange rate has remained stable for a considerable period of time or, in some cases, has even appreciated.

The main predictions of the model are the following:

- 1) Access to foreign funds should increase the degree of asset substitution in bank lending but decrease the degree of asset substitution in bank deposits. Since funds are concentrated in foreign currency, banks find it optimal to offer lower rates on foreign currency-denominated loans to attract potential borrowers, whereas they offer lower rates on foreign currency deposits as they have no need to attract foreign currency-denominated savings. This, in turn, triggers a shift towards the local currency in households' deposit portfolios.<sup>68</sup>
- 2) Interest rate differentials between local and foreign currency loans/deposits are expected to have an impact. Wider interest rate differentials on loans would increase the share of foreign currency-denominated loans in total domestic loans. Larger interest rate differentials on deposits should have a negative effect on the foreign currency share of deposits.
- 3) The relative volatilities of inflation and the real exchange rate should be a significant explanatory variable of asset substitution, validating the main implication of the minimum variance portfolio theory.<sup>69</sup>

The theoretical implications of the model have been tested on our panel of central, eastern and south-eastern European countries, excluding Turkey. The empirical analysis is based on a unique dataset, which has mainly been compiled from national sources, with monthly observations from January 2000 to April 2006. The dependent

variable is the ratio of foreign currency loans/deposits to total domestic loans/deposits, measured in terms of both levels and changes.<sup>70</sup> The main explanatory variables include:

- the ratio of foreign liabilities of banks to total funds net of deposits (*ratio*), i.e. foreign liabilities plus capital;
- measures of the relative variance of inflation and the real exchange rate according to the minimum variance portfolio theory (*lambda*);<sup>71</sup>
- interest rate differentials between local and foreign currency loans (*ir\_dif\_l*) and deposits (*ir\_dif\_d*); and
- lending-deposit spreads in both local (*spread\_lc*) and foreign currency (*spread\_fc*) to capture the degree of competitiveness in the respective banking sectors.

Further macroeconomic control variables include the openness of the economy (*open*), measured as the ratio of total trade to GDP; the exchange rate regime (*interv*), proxied by a central bank intervention index comparing the variability of international reserves and the exchange rate; and financial depth (*depth*), calculated as the ratio of domestic credit to GDP.<sup>72</sup>

68 This is indeed confirmed by the behaviour of the spreads in Chart 21.

69 See sub-section 2 of this special focus.

70 In addition, Basso, H.S., O. Calvo-Gonzalez and M. Jurgilas (2007) tested the model on a larger panel of 24 countries, including nine CIS countries and controlled the results for a further disaggregation of foreign currency deposits/loans shares for both households and non-financial corporations. The main qualitative results of this extended analysis are similar to those presented in this special focus.

71 See footnote 52 in sub-section 2 of this special focus.

72 The various equations have been estimated via Feasible Generalised Least Squares with panel heteroskedasticity and panel specific autocorrelation. Because of better small sample properties, all equations have also been re-estimated via OLS with heteroskedasticity and autocorrelation errors. The main qualitative results do not change. In order to account for possible endogeneity of interest rate differentials and margins, the model has been estimated using lagged values of interest rate differentials and margins. In any case, estimation of the model based on the contemporaneous variables yields qualitatively similar results.



Table 21 Asset substitution – estimation results

	Regressions on levels of dependent variable		Regressions on changes of dependent variable	
	Loans	Deposits	Loans	Deposits
<i>ratio</i>	0.037* (-1.70)	-0.123*** (-6.63)	0.023** (-2.00)	-0.023** (-2.07)
<i>lambda</i>	0.008 (-0.11)	0.244*** (-6.90)	0.029*** (-2.84)	0.000 (-0.01)
<i>ir_dif_l</i>	-0.001 (-1.26)		0.001** (-2.04)	
<i>ir_dif_d</i>		0.001 (-1.15)		-0.000* (-1.73)
<i>spread_lc</i>	0.000 (-0.32)	0.000 (-0.39)	0.000 (-1.05)	0.000 (-0.89)
<i>spread_fc</i>	0.000 (-0.85)	0.000 (-0.68)	0.000 (-0.68)	0.000 (-0.36)
<i>open</i>	0.001 (-0.05)	0.068*** (-4.32)	0.004 (-0.63)	0.001 (-0.22)
<i>interv</i>	0.012 (-1.07)	0.013 (-1.34)	-0.004 (-1.02)	0.006 (-1.28)
<i>depth</i>	0.206*** (-3.26)	-0.182*** (-5.37)	-0.015* (-1.74)	0.015 (-1.47)
<i>No. of obs.</i>	519	519	519	519

Source: ECB staff calculations.

Notes: The dependent variable is the ratio of foreign currency loans/deposits to total domestic loans/deposits. See the main text for a definition of the independent variables. t-ratios are in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5%, and 1% levels.

Overall, the main empirical results lend support to the theoretical implications of the model (see Table 21). As predicted by the model, the share of banks' foreign funds in total funds (*ratio*) has a positive impact on the share of foreign currency loans in total loans and a negative impact on the share of foreign currency deposits in total deposits. This result is very robust across specifications. Results regarding interest rate differentials are somewhat mixed. On the one hand, interest rate differentials have no impact on the *level* of asset substitution. On the other hand, though, they have a small but significant impact on the *change* in asset substitution, which is positive in the case of loans, but negative in the case of deposits, as predicted by the theory. Lending-deposit spreads conversely do not have a significant impact on asset substitution. In accordance with the minimum variance portfolio theory, the level of asset substitution increases in line with the increase in the volatility of inflation relative

to that of the real exchange rate (*lambda*). However, the coefficient differs significantly from zero only for the level of asset substitution in deposits and the change in asset substitution in loans.

Among the other control variables, measuring the impact of market openness (*open*) reveals that it is a significant determinant of the share of foreign currency deposits in total deposits, whereas the central bank intervention index (*interv*) has no explanatory power. Finally, the coefficients of credit market depth (*depth*) differ significantly from zero in the regressions on the levels of the dependent variable. More interestingly, their signs match those of the coefficients of the *ratio* variable (positive for loans and negative for deposits). This result confirms that domestic credit growth in central, eastern and south-eastern Europe is mostly driven by the influx of foreign funds through the increase in foreign liabilities.

## 5 CONCLUDING REMARKS

Asset substitution has been an important and persistent phenomenon in central, eastern and south-eastern Europe. The use of foreign currencies in domestic financial transactions has remained generally stable over the past few years and, in some cases, such as for loans in the new Member States, has even been on the rise. Asset substitution has persisted even though these countries have achieved comparatively low inflation and a high degree of exchange rate stability. In this context, since its introduction, the euro has been playing an important – often major – role in the domestic financial markets in these countries. This suggests that the process of asset substitution – in addition to hysteresis effects – is largely driven by the geographical proximity of the EU and the institutional anchor of prospective EU and EMU membership, which, in a number of cases, is reinforced by the role of the euro as an external anchor. In addition, foreign-owned banks – mainly from the euro area – extending euro-denominated credit lines have contributed to a further increase in asset substitution.

A recent ECB staff study aimed to capture these effects in a model, testing its predictions for the countries in central, eastern and south-eastern Europe. The results suggest that the increasing presence of foreign banks and the influx of foreign funds have indeed been associated with a rise in asset substitution in bank lending. By contrast, greater access to foreign funds has been associated with a drop in the share of foreign currency deposits in total deposits. In addition, the analysis confirms that the trade-off between variability of inflation and that of the real exchange rate helps to explain the use of foreign currencies in bank lending and deposits. Finally, larger interest rate differentials also seem to play a role, having a positive impact on the change in the share of foreign currency loans in total loans and a negative impact on the change in the share of foreign currency deposits.

## CONCLUSIONS

Over the review period, developments in the international use of the euro have differed across global market segments. While the international role of the euro declined slightly in a number of segments, namely international debt securities, international deposits and loans, foreign exchange and invoicing of imports of goods, in other segments it continued to show a significant degree of stability or a gradual expansion. In line with the conclusions drawn in previous reports, this review finds the internationalisation of the euro to be characterised by a strong institutional and regional pattern.

For the first time since the start of Economic and Monetary Union, the euro share in the stock of international debt securities declined over the review period. In particular, the euro share fell in the market for long-term securities, mainly as the indirect effect of a large increase in the issuance of bonds and notes denominated in US dollars. Borrowers from the private sector, in particular from the financial sector, and from non-euro area EU Member States continue to be the major non-euro area issuers of euro-denominated bonds. The euro share in the international loan and international deposit markets also declined. At the same time, closer analysis reveals a growing role of emerging Europe as a destination for euro-denominated loans from euro area banks.

In foreign exchange markets, the euro share declined slightly. Turning to the settlement and invoicing of international trade, the euro share in exports of goods from euro area countries appears to have stabilised, while it fell notably in imports of goods in the review period, which was possibly related to developments in energy markets. In contrast, its upward trend seems to have continued for exports and imports of services. For countries outside the euro area, the available evidence suggests that the role of the euro as an invoicing or settlement currency is most prominent in countries neighbouring the euro area, most notably in the non-euro area EU countries and the EU candidate countries.

During the review period the euro maintained its role as an exchange rate anchor for countries in the geographical proximity of the EU and countries that have established special institutional arrangements with the EU or its Member States. The use of the euro in the foreign exchange reserves in third countries, measured at current exchange rates, has moderately increased during the review period, mostly reflecting positive valuation effects for the euro. At the same time, the significance of reserves or other foreign assets held by countries which do not disclose the currency composition of these assets has further increased during the review period. Thus, the available evidence on the currency composition of foreign exchange reserves has to be interpreted with caution.

The stock of euro banknotes held outside the euro area, approximated by net shipments by euro area banks to destinations outside the euro area, has continued to gradually increase while the size of net shipment flows has started to decline. As regards foreign currency deposits held outside the euro area, the euro share increased in most new EU Member States and EU candidate countries.

# DATA SHEET

	This review (latest data available)	Previous review
<b>The euro in international debt markets</b>		
<i>Share of the euro in:</i>		
– globally defined stock of debt securities	2006 Q4: 27.8%	2005 Q2: 26.1%
– broadly defined stock of international debt securities	2006 Q4: 47.0%	2005 Q2: 45.7%
– narrowly defined stock of international debt securities <sup>1)</sup>	2006 Q4: 31.4%	2005 Q2: 33.8%
– narrowly defined issues of international bonds and notes (gross issues at current exchange rates)	2006 Q4: 27.4%	2005 Q2: 33.7%
– narrowly defined issues of international money market instruments (gross issues at current exchange rates)	2006 Q4: 34.4%	2005 Q2: 37.1%
– portfolios of funds under management in the United States and Canada included in the eMaxx database	mid-2006: 0.7%	mid-2005: 0.7%
– portfolios of funds under management in non-euro area Europe included in the eMaxx database	mid-2006: 27.8%	mid-2005: 26.2%
<b>The euro in international loan and deposit markets</b>		
<i>Share of the euro in:</i>		
– cross-border loans from euro area banks to non-bank borrowers outside the euro area <sup>1)</sup>	2006 Q4: 36.3%	2005 Q1: 39.4%
– cross-border loans from non-euro area banks to non-bank borrowers in the euro area <sup>1)</sup>	2006 Q4: 54.2%	2005 Q1: 56.6%
– cross-border loans from non-euro area banks to non-bank borrowers outside the euro area (narrow measure) <sup>1)</sup>	2006 Q4: 16.7%	2005 Q1: 20.2%
– cross-border deposits of non-euro area non-banks in banks in the euro area <sup>1)</sup>	2006 Q4: 46.7%	2005 Q1: 52.5%
– cross-border deposits of euro area non-banks in banks outside the euro area <sup>1)</sup>	2006 Q4: 49.9%	2005 Q1: 53.8%
– cross-border deposits of non-euro area non-banks in banks outside their country of residence excluding the euro area (narrow measure) <sup>1)</sup>	2006 Q4: 18.0%	2005 Q1: 21.3%
<b>The euro in foreign exchange markets</b>		
<i>Share of the euro in:</i>		
– total foreign exchange turnover <sup>2)</sup>	April 2004: 37.2%	April 2001: 37.6%
– daily settlement with CLS <sup>2)</sup>	1 July 2005-31 Dec. 2006 (average): 39.3%	1 July 2004-30 June 2005 (average): 40.7%
<b>The euro in trade in goods and services</b>		
<i>Share of the euro in:</i>		
– settlement/invoicing of goods exports from selected euro area countries to non-euro area countries	2005: 39% to 62%	2004: 44% to 63%
– settlement/invoicing of goods imports of selected euro area countries from non-euro area countries	2005: 34% to 56%	2004: 41% to 61%
– settlement/invoicing of services exports from selected euro area countries to non-euro area countries	2005: 16% to 67%	2004: 14% to 64%
– settlement/invoicing of services imports of selected euro area countries from non-euro area countries	2005: 23% to 71%	2004: 24% to 70%
<b>The euro in third countries</b>		
– number of countries or territories whose exchange rate regimes were linked to the euro <sup>3)</sup>	end-2006: 40	mid-2005: 50
– share of the euro in global foreign exchange reserves (measured at current exchange rates)	end-2006: 25.8%	end-2004: 24.9%
– cumulative net shipments of euro banknotes to destinations outside the euro area	Dec. 2006: €60 billion	June 2005: €55 billion
– total stock of euro-denominated bank deposits in EU neighbouring regions <sup>4)</sup>	Dec. 2006: €69.0 billion	June 2005: €68.0 billion

1) At constant 2006 Q4 exchange rates.

2) Given the convention of accounting 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) Due to changes in the counting of states of currency unions, such as the Central African Economic and Monetary Community (CAEMC) and the West African Economic and Monetary Union (WAEMU), the figure appearing in this review is not fully comparable to the one presented in the last review.

4) The data refer to 20 countries and territories for which data are available for both 2005 and 2006, excluding Denmark, Sweden, Switzerland and the United Kingdom (which are shown in Table 19). Due to some changes to the country composition, this figure may not be fully comparable to the one presented in the last review.

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