



EUROPEAN CENTRAL BANK

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REPORT ON CARD FRAUD

JULY 2012





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EXECUTIVE SUMMARY

This oversight report analyses fraud developments related to card payment schemes (CPSs) in the Single Euro Payments Area (SEPA) and, in total, covers almost the entire cards market. The total level of fraud amounted to €1.26 billion in 2010. This corresponds to an increase of 0.7% since 2007, but also to a decline of 12.1% since 2009. Fraud in relative terms, i.e. the share of the transaction value related to fraud, fell from 0.045% in 2007 to 0.040% in 2010, having reached 0.050% in 2009. In 2010 half of the value of fraud resulted from card-not-present (CNP) payments – i.e. payments via mail, telephone or the internet – while a third resulted from point-of-sale (POS) terminals and a sixth from automated teller machines (ATMs). The same trends were observed with respect to fraud volumes, although ATM fraud was less prevalent and POS fraud more significant.

In terms of card types, fraud levels were more than four times higher for delayed debit and credit cards than for debit cards. Here, too, CNP payments were the main channel for fraud, accounting for 58% of all delayed debit and credit card fraud and 39% of all debit card fraud. The figures for POS payments were 36% for delayed debit and credit card fraud and 30% for debit card fraud, while ATM fraud made up 31% of fraud using debit cards, but only 6% of fraud using delayed debit and credit cards. This pattern is also confirmed by transaction data, which show that ATM retrievals accounted for 46% of the transaction value of debit cards, but only 27% of the transaction value of delayed debit and credit cards.

The good news is that the value of fraud at ATMs and POS terminals was even lower in 2010 than in 2007. In more than 90% of cases, ATM and POS fraud is committed using counterfeit cards or cards that have been lost or stolen. It is evident that the importance of counterfeit fraud has declined, most probably because of migration to Europay, MasterCard and Visa (EMV). It is also evident that, nowadays, such

fraud typically occurs in countries located outside SEPA. On the other hand, CNP fraud increased from €571 million in 2007 to €648 million in 2010. The fact that it accounted for 52% of the total value of fraud in 2010 has raised concerns among the authorities and was reflected in the recommendations for the security of retail payments which are being developed by the European Forum on the Security of Retail Payments.

From a geographical perspective, fraudulent card payments acquired outside SEPA and fraudulent cross-border payments acquired inside SEPA each accounted for around a quarter of all card fraud in 2010. In terms of regular transactions, these shares stood at 2% (for transactions acquired outside SEPA) and 5% (for cross-border transactions acquired inside SEPA), indicating high levels of fraud for cross-border payments. The latter are mainly likely to arise from fraudsters' preference to target terminals that have low security standards, such as those using magstripe technology. The euro area experienced slightly lower fraud levels than SEPA as a whole from both an issuing and acquiring perspective. Surprisingly, fraudsters in the euro area relied more on ATM and POS fraud than on CNP fraud.

For individual countries, there were large variations with respect to card usage: the number of cards per inhabitant ranged from 0.6 to 2.6, while the number of payments made per year and inhabitant ranged from 14 to 228, and the corresponding transaction values from €1,109 to more than €12,000 per year. Fraud shares, i.e. the share of the transaction value or volume related to fraud, ranged from 0.004% to 0.082% in terms of value and from 0.001% to 0.032% in terms of volume. There were also huge differences with regard to the transaction channels used by fraudsters: from the perspective of the country in which a card was issued, fraud acquired at ATMs only accounted for between 3% and 39% of total fraud, while the share of CNP fraud ranged from 18% to 74%, and the share of POS fraud from 18% to 71%.

From an acquiring perspective, these variations were even larger: ATM fraud ranged from 0% to 91%, CNP fraud from 3% to 84%, and POS fraud from 7% to 65%.

Finally, it can be concluded that fraud as an international organised activity requires cooperative fraud prevention measures and international standards, such as EMV, or strong authentication in combination with 3-D Secure. Moreover, it is important to facilitate the exchange of information between schemes in order to identify points of compromise quickly.

INTRODUCTION

In May 2008, following the ECB Governing Council's approval of an oversight framework for CPSs in January that year, the Eurosystem began an oversight assessment of CPSs operating in the euro area against the newly established oversight standards. As part of the harmonised implementation of oversight, statistical information is gathered on card schemes. Each scheme is asked to supply general business data (e.g. the number of cards issued, as well as the number of ATMs and POS terminals and the number and value of transactions) and state the number and value of fraud transactions for each EU Member State, as well as for Switzerland, Iceland, Liechtenstein and Norway (which are also SEPA countries). So, for ATMs and POS terminals, fraud figures are broken down into "lost and stolen", "card not received", "counterfeit" and "other" while, for total CNP transactions, an optional breakdown into "online" and "mail or phone" is conducted. The collection of data is based on common templates and definitions. Note that fraud is defined independently of whether the loss is finally borne by the customer, issuer, acquirer or merchant.

This report uses data provided by national and international CPSs for oversight purposes. These data were reported either to national central banks or to the ECB. Data from 24 CPSs overseen by the Eurosystem were used in creating the report. A comparison of the transaction data with data from the ECB's Statistical Data Warehouse suggests that the data available for 2010 represent 96% of the total value of transactions within the EU. Unfortunately, the coverage for some individual countries is below 80%, which is a result of the fact that some CPSs are waived from the oversight requirements¹ or from incomplete data reporting. Data from three CPSs are incorporated from 2009 onwards, while data from another CPS are used from 2008 onwards. Note that this variation in data coverage renders some comparisons across time invalid. Moreover, an assumption had to be made in order to avoid

overlaps between figures reported by international and national CPSs. Data from one CPS have been excluded from the analysis, since it was not yet able to comply with the reporting standards. Furthermore, some card schemes were not able to differentiate between CNP and POS transactions, whereas they were able to provide this distinction for fraudulent transactions. National central banks and the ECB have checked and processed the data with due care. Yet errors may remain in relation to data provision, transmission or processing. All results presented in this report should therefore be read and interpreted with due care.

All results refer to payments with cards issued in SEPA. Moreover, results are generally derived from an issuing perspective except in Chapter 6, where an acquiring perspective is adopted for some results. In these cases, the change of perspective is highlighted, as is the fact that the figures refer only to transactions with cards issued within SEPA.

The report is structured as follows: Chapter 1 presents findings on the total level of card fraud, Chapter 2 looks at card fraud for different card functions, Chapter 3 focuses on CNP fraud, Chapter 4 analyses different categories of card fraud at ATMs and POS terminals, Chapter 5 compares domestic transactions and fraud figures with cross-border figures both inside and outside SEPA, while Chapter 6 provides total and relative fraud levels, as well as other information for individual SEPA countries, and Chapter 7 concludes.

¹ See European Central Bank (2008), "Oversight framework for card payment schemes – standards", p6, January.

I TOTAL LEVEL OF CARD FRAUD

Total card fraud in SEPA amounted to €1.26 billion in 2010, which represents an increase of 0.7% since 2007.² In the same period the value of transactions increased by 5.1%. The intensity of card fraud thus declined in this period. This was mainly due to a reduction in fraud from 2009 to 2010: the total value of fraud decreased by 12.1%, while transactions increased by 7.7%.

Table 1a indicates the share of fraud in relation to transactions, i.e. the total value of fraud divided by the value of all transactions: the intensity of fraud increased markedly from 2007 to 2008 and slightly from 2008 to 2009, but fell sharply in 2010. That year, the share of fraud amounted to 0.040%, implying that €1 out of every €2,475 spent was fraudulent. On a per card basis, €1.73 was lost for each physical card³ issued.

In 2007 fraud at ATMs accounted for 20% of all card fraud, while fraud at POS terminals made up 33% and CNP fraud the remaining 48%. By 2010 the share of ATM fraud had dropped

Table 1a Value of fraud as a share of the value of transactions

(percentages)			
2007	2008	2009	2010
0.045	0.049	0.050	0.040

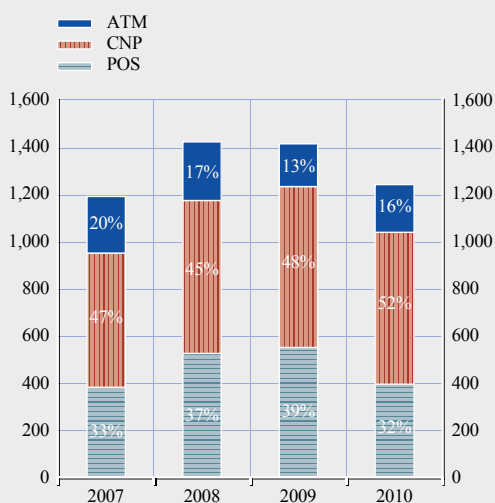
Source: All reporting CPSs.

to 16%, while fraud at POS terminals remained rather stable at 32% and CNP fraud had increased to 52% of all card fraud. Figure 1a shows the development of the total value of fraud and yearly breakdowns into payment channels. Note that increases in the absolute value of fraud in 2008 and 2009 are partly driven by the inclusion of further CPSs.

- The €1.26 billion reflects the losses of all the reporting CPSs, whereas growth rates in this section are calculated on the basis of the data from those CPSs which have provided data for the two years to be compared. The growth rates are therefore not influenced by variations in data provision.
- Cards are often “co-branded”, i.e. they provide services offered by more than one CPS. A common setting is that one CPS provides domestic services, while another provides international services. Such co-branded cards are said to logically contain more than one card, although physically they are one device. Information on physical cards is taken from the ECB’s Statistical Data Warehouse.

Figure 1a Evolution of the total value of card fraud with cards issued inside SEPA^{1), 2)}

(EUR millions)



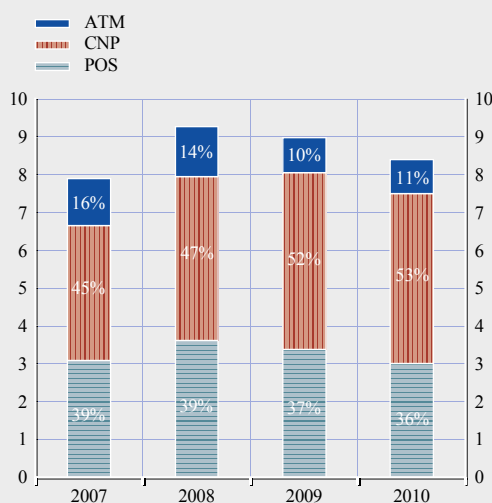
Source: All reporting CPSs¹⁾.

1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.

2) Owing to rounding, percentages do not always add up to 100%.

Figure 1b Evolution of the total volume of card fraud with cards issued inside SEPA^{1), 2)}

(million transactions)



Source: All reporting CPSs¹⁾.

1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.

2) Owing to rounding, percentages do not always add up to 100%.

Table 1b Volume of fraud as a share of the volume of transactions

(percentages)			
2007	2008	2009	2010
0.022	0.023	0.021	0.018

Source: All reporting CPSs.

Figure 1b presents the corresponding figures with respect to volumes, i.e. the number of fraudulent transactions made. As with the fraud values, the absolute number of fraud cases has declined since 2008. A breakdown of fraud by type of transaction shows that CNP transactions have become more relevant from year to year, while the importance of ATM and POS fraud has been declining. In 2010 CNP fraud accounted for more than half of all fraud transactions, with POS fraud making up 36% and ATM fraud the remaining 11%. A comparison of fraud volumes with fraud values reveals that ATM fraud has a larger share in terms of value than in terms of volume, indicating that ATM fraud usually involves larger losses per transaction than the other channels. The opposite is true for POS fraud.

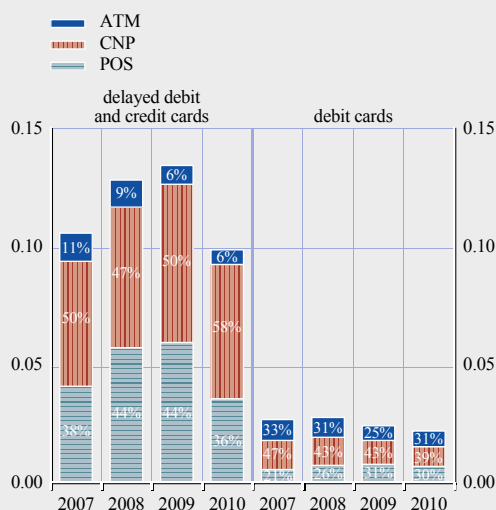
The ratio of fraudulent transactions as a percentage of total transactions reported in Table 1b reveals that fraud is less prevalent in terms of transaction volume than in terms of transaction value. The downside of this observation is of course that the average value of fraudulent transactions is higher than the average value of regular transactions. On a per card basis, 1.2% of all physical cards⁴ issued within SEPA were affected by fraud, which means that 12 out of 1,000 physical cards were used fraudulently.

2 CARD FRAUD FOR DIFFERENT CARD FUNCTIONS

Figure 2 shows separate fraud shares for delayed debit and credit cards, as well as for debit cards. In 2010 the share of fraud accounted for by debit cards amounted to 0.022%, which corresponds to €1 of fraud for every €4,545 of turnover. The share of fraud accounted for by delayed

Figure 2 Fraud shares and the composition of fraud for different card functions^{1), 2)}

(y-axis: value of fraud as share of value of transaction; percentages)



Source: All reporting CPSs except those in France and Spain.

1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.

2) Owing to rounding, percentages do not always add up to 100%.

debit and credit cards was 0.099%, which corresponds to around €1 in every €1,010 being spent fraudulently, i.e. more than four times the share of fraud accounted for by debit cards.

CNP was the most common fraud channel for both delayed debit and credit cards and for debit cards (58% and 39% respectively). The share of POS fraud was roughly similar for both card types (36% for delayed debit and credit cards and 30% for debit cards). The difference for ATM-related fraud is striking at first glance, as it accounted for only 6% of all delayed debit and credit card fraud, but for 31% of all debit card fraud. It has to be acknowledged that, in most countries, the prevailing fee structure provides little incentive to withdraw money from ATMs with credit cards. Consequently, debit cards are more frequently used for cash withdrawals and are likewise exposed to a higher risk of ATM fraud.⁵ On the other hand, credit cards are used

⁴ As above, information on physical cards is taken from the ECB's Statistical Data Warehouse.

⁵ ATM retrievals account for 46% of the transaction value of debit cards, but only 17% of that of delayed debit and credit cards.

on the internet more frequently than debit cards. A further explanation for the lower fraud levels of debit cards may be the fact that the bank account is debited much faster, thereby allowing for a faster reaction by the cardholder. In some countries, all the domestic debit card transactions are authorised online via the chip.

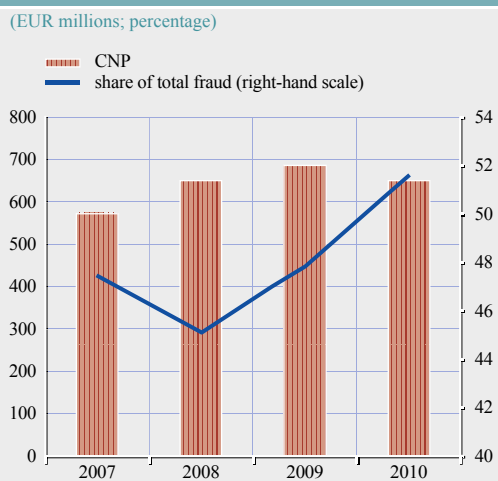
3 CNP FRAUD

As outlined above, the relevance of CNP fraud has increased over the last few years. Figure 3 illustrates the total level of CNP fraud and its share of total fraud. The absolute level of CNP fraud increased from €571 million in 2007 to €649 million in 2008 and €684 million in 2009, before declining to €648 million in 2010. The share of CNP in the total value of fraud decreased from 2007 to 2008, but has since increased to more than 50% of all fraud.⁶

The trend suggests that CNP fraud might become even more relevant in the future. This conclusion is supported by the fact that CNP fraud does not benefit from measures such as EMV migration (see below), which is aimed at fighting fraud at ATMs and POS terminals. Nevertheless, there are other measures that could help to reduce CNP fraud. Notably, according to the UK cards association, CNP fraud in the United Kingdom has fallen by a third since 2007, thanks to the increasing use of fraud screening tools by retailers and payment service providers, as well as the use of 3D Secure.⁷ Moreover, the increasing relevance of CNP fraud was one of the reasons that supervisors of payment service providers and overseers drew up recommendations for the security of internet payments as part of the work of the European Forum on the Security of Retail Payments.

The value of domestic CNP fraud, i.e. fraud that was acquired in the country in which the card was issued, accounted for 55% of all CNP fraud. In other words, only 45% of the value of all CNP fraud crosses borders.⁸ Comparing this with the distribution of fraud at POS terminals

Figure 3 Evolution of the value of CNP fraud and its share of the total value of fraud¹⁾



Source: All reporting CPSs¹⁾.

1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.

and ATMs (see Figure 5), it can be concluded that the CNP payment channel has the lowest share of cross-border fraud.

Most CPSs provide a further breakdown for CNP fraud into “online” and “mail and telephone” fraud. Where a breakdown is available, mail and telephone fraud accounts for 26% of all CNP fraud. For the median SEPA country, however, only around a sixth of all CNP fraud can be attributed to mail and telephone fraud, while 83% of CNP fraud is online fraud.

4 FRAUD CATEGORIES AT ATMs AND POS TERMINALS

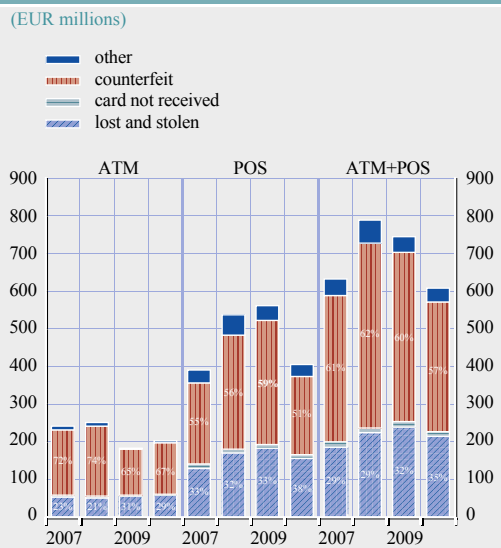
Fraud committed at ATMs and POS terminals can be broken down into four categories, as illustrated in Figure 4. For both kinds of terminals, “counterfeit” fraud is clearly the largest category, followed by “lost and stolen” fraud.

6 This finding also holds if considering only those CPSs that provide data on the full period.

7 See Financial Fraud Action UK (2012), “Fraud. The Facts”, available on the Financial Fraud Action UK website at <http://www.financialfraudaction.org.uk/Publications>, p 12.

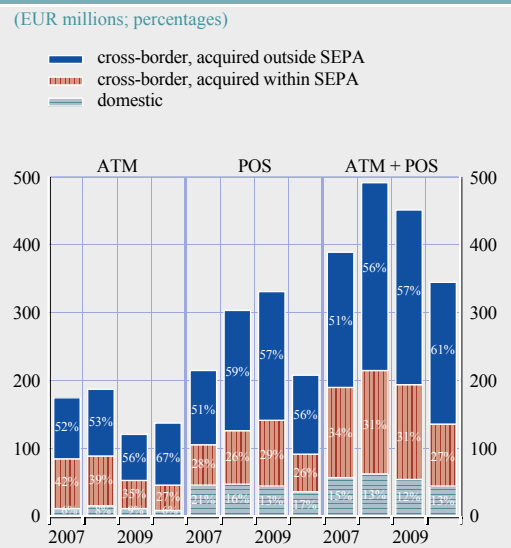
8 It must be remembered that fraud transactions with cards issued outside SEPA are not included in the statistics.

Figure 4 Evolution of the value of fraud categories at ATMs and POS terminals¹⁾



Source: All reporting CPSs¹⁾.
 1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.

Figure 5 Evolution of the value of counterfeit fraud at ATMs and POS terminals^{1), 2)}



Source: All reporting CPSs¹⁾.
 1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.
 2) Owing to rounding, percentages do not always add up to 100%.

In 2010 counterfeit fraud accounted for €344 million worth – or 57% – of all ATM and POS fraud, while lost and stolen fraud accounted for €215 million worth – or 35%. The fraud category “card not received” made up approximately 2% of fraud, with the category “other” accounting for the remaining 6%. A comparison of the two types of terminal highlights the fact that, in relative terms, counterfeit fraud plays a more prominent role in ATM fraud, while the lost and stolen category is more relevant for POS fraud.

Fraud at ATMs and POS terminals combined increased in 2008, but has since declined to €609 million, which is slightly below the 2007 level, even though the 2010 data comprise a larger number of CPSs. The 16% increase in lost and stolen fraud was offset by an 11% decrease in counterfeit fraud. Looking at the data from 2007 to 2009, the use of counterfeit cards appears to have shifted from ATMs to POS terminals. One potential explanation for this might be the faster implementation of EMV at ATMs (see Table 2 for further details).

Figure 5 illustrates where fraud using counterfeit cards was acquired. Counterfeit fraud implies, for example, that the information on the magnetic stripe (magstripe) of a card is copied and subsequently used to create a copy of the card. In most cases, fraudsters manipulate ATMs in a way that does not modify the use of the ATM. Consequently, a customer does not usually notice when his or her card has been copied, and so has little chance of preventing the fraud. In some circumstances, CPSs are able to detect and prevent it by analysing the geographical usage of the card. For example, it would not be possible for a transaction authorised online to be requested for the same card from terminals in Lisbon and Los Angeles within two hours of each other. In such a case, the issuer may block the card, as it is very likely that it would have been cloned.

Some CPSs use another way to detect counterfeit fraud: at the end of a domestic ATM or POS transaction, a random number is generated by the central server and stored on the magstripe of the card. Moreover, the

numbers stored on the server and the card are compared at the beginning of each transaction. At the exact moment a card is cloned, the information on the two cards and the server is identical. Subsequently, new random numbers generated by the server will be stored on only one of the two cards and transactions can be blocked as soon as the second card is used.⁹

The seventh SEPA progress report¹⁰ states that: “In order to improve the security of card transactions at POS terminals and ATMs, the European payment industry has agreed on the need to migrate from “magnetic stripe” to “EMV chip”. The use of EMV specifications for cards and terminals, together with the use of PINs, shall make card transactions more secure. By using a chip card instead of a magnetic stripe card, stronger cryptographic algorithms can be used to authenticate cards.” EMV is therefore one way of reducing counterfeit fraud. However, the effectiveness of EMV does not just depend on the design of a card. It also requires payment terminals that support the technology. Table 2 indicates the extent to which cards and payment terminals in the EU have supported the EMV standard in the last few years.

When looking at Figure 5, it appears that counterfeit fraud shifted from ATMs to POS terminals, as the latter were lagging behind in EMV migration between 2007 and 2009. According to the European Payment Council’s (EPC) migration indicators,¹¹ POS migration at EU level had reached 80% by the end of 2009, which was still less than the migration level reached for ATMs by the end of 2007. Comparing 2009 and 2010 data suggests that the

catch-up in EMV migration at POS terminals could have led to a significant decline in POS fraud and a shift back towards ATMs.

In addition to the absolute value of counterfeit fraud, Figure 5 also provides information on where fraudulent payments were made. The share of domestic counterfeit fraud appears to be rather stable, while cross-border fraud appears to have shifted to countries outside SEPA. Since the country in which to commit counterfeit fraud can be chosen fairly freely, the implementation status of the EMV standard is typically lower in the countries targeted. The findings suggest that, in order to achieve a significant improvement in the situation, the use of magstripe would have to be ruled out completely.

5 DOMESTIC AND CROSS-BORDER FRAUD

Card fraud is an international and highly mobile form of crime. This is apparent when looking at the relative payment flows of transactions and fraud shown in Figure 6. In 2010 domestic payments, i.e. payments acquired in the country in which the card was issued, accounted for 93% of the total transaction value, but for only 47% of the total value of fraud. Cross-border payments within SEPA, defined as payments with cards issued in a SEPA country and acquired in a different SEPA country,¹² accounted for only 5% of the total transaction value, but for 27% of the total fraud value. The situation is even worse for cross-border payments acquired outside SEPA,¹³ where a 2% share in transactions contrasted with a 25% share in fraud value.

Table 2 EMV migration levels in the EU

	Q4 2007	Q4 2008	Q4 2009	Q4 2010
ATMs	81%	91%	92%	96%
POS terminals	65%	74%	80%	90%
Cards	60%	67%	71%	81%

Source: ECB.

Note: Percentages based on quarterly data collected by the European Payments Council.

⁹ Note that this mechanism can prevent fraud losses in the first place if the original card is used before the cloned card is used for the first time.

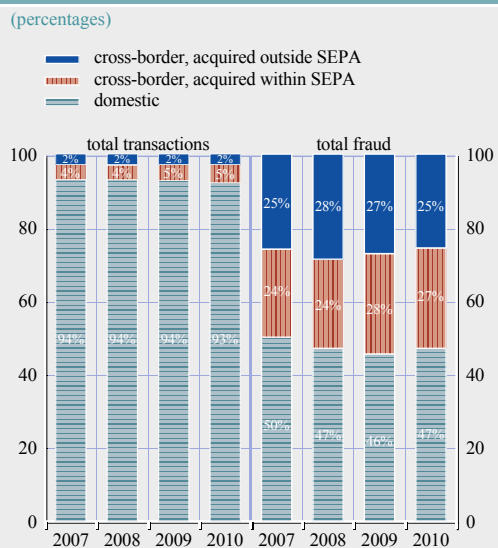
¹⁰ See European Central Bank (2010), “7th SEPA progress report: Beyond theory into practice”, p 36, October.

¹¹ See the section on indicators on the ECB’s website at <http://www.ecb.europa.eu/paym/sepa/about/indicators/html/index.en.html>.

¹² Figures for cards issued outside, but used inside, SEPA are currently not available.

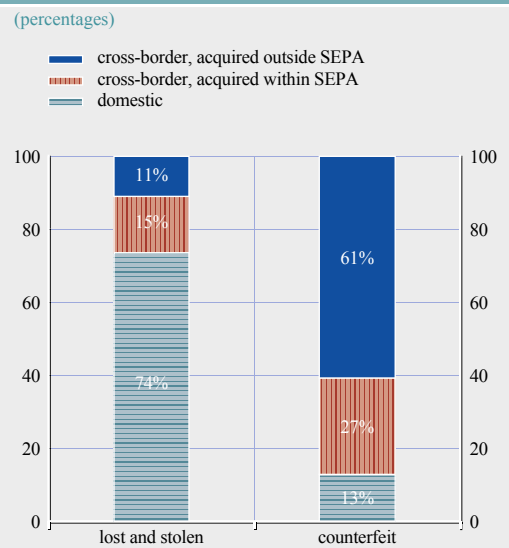
¹³ Cross-border payments made outside SEPA refer to payments effected with cards issued in a SEPA country and made in terminals or online shops located outside SEPA.

Figure 6 Evolution of the value of domestic and cross-border transactions and fraud^{1), 2)}



Source: All reporting CPSs¹⁾.
 1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.
 2) Owing to rounding, percentages do not always add up to 100%.

Figure 7 Geographical composition of “lost and stolen” and “counterfeit” fraud at ATMs and POS terminals according to the fraud value¹⁾



Source: All CPSs, 2010.
 1) Owing to rounding, percentages do not always add up to 100%.

When interpreting these figures, however, one should be aware that they reflect the risk from an acquirer’s perspective and not necessarily from a consumer’s perspective. Fraud may be initiated at domestic level, e.g. by skimming the card’s magstripe, but lead to fraudulent payments being acquired abroad.

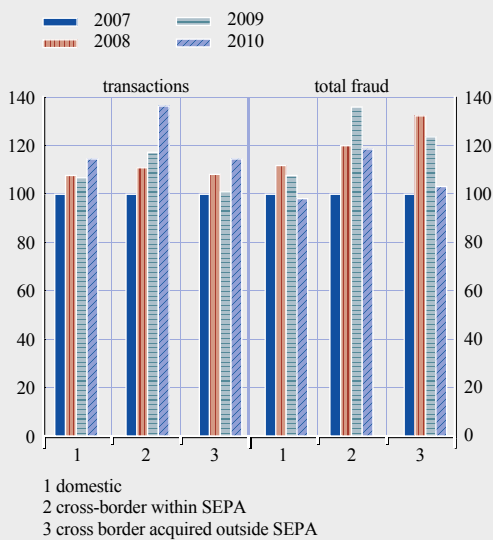
Figure 7 (above) depicts this geographical breakdown for fraud committed at ATMs and POS terminals. If a card has been lost or stolen, fraudsters have to be quick to use the card before it is reported stolen and thus blocked. Typically, therefore, lost and stolen fraud is acquired in the same country in which the card was stolen (i.e. usually the same country in which the card was issued, which explains the high share of domestic fraud). A comparison of counterfeit fraud with lost and stolen fraud indicates that counterfeit fraud is far more likely to take place across borders than domestically. In 2010 74% of lost and stolen fraud took place domestically, while 87% of counterfeit card fraud took place across borders. The share of counterfeit fraud acquired outside SEPA was 61%.

Another aspect worth mentioning in the context of domestic versus cross-border payments is the recent development of fraud and transaction figures. Figure 8 illustrates the evolution in the value of transactions and fraud, taking 2007 as the base year (i.e. the figures for the year 2007 have been assigned a value of 100 and the remaining years have been calculated accordingly). The graph shows that the value of domestic transactions has increased by 15% since 2007, while fraud in 2010 was below its 2007 level, after a 12% increase in 2008.¹⁴ The value of cross-border transactions within SEPA increased by almost 37% in those four years and the corresponding value of fraud by 19%. Similarly, cross-border transactions issued inside and acquired outside SEPA increased by 15% and the corresponding fraud figures by 4%. In all cases, therefore, the increase in the value of transactions has been higher than the increase in the value of fraud, which leads to the conclusion that both domestic and cross-border

¹⁴ Note that results are partly driven by the inclusion of data from additional CPSs in 2008 and 2009.

Figure 8 Evolution of the total value of domestic and cross-border transactions and fraud¹⁾

(2007 = 100)



Source: All reporting CPSs¹⁾.

1) Note that, as outlined in the introduction, total fraud levels in the years 2008 and 2009 increased, partly due to the inclusion of data from additional CPSs.

transactions have become safer in relative terms. However, this trend refers only to cards issued within SEPA.

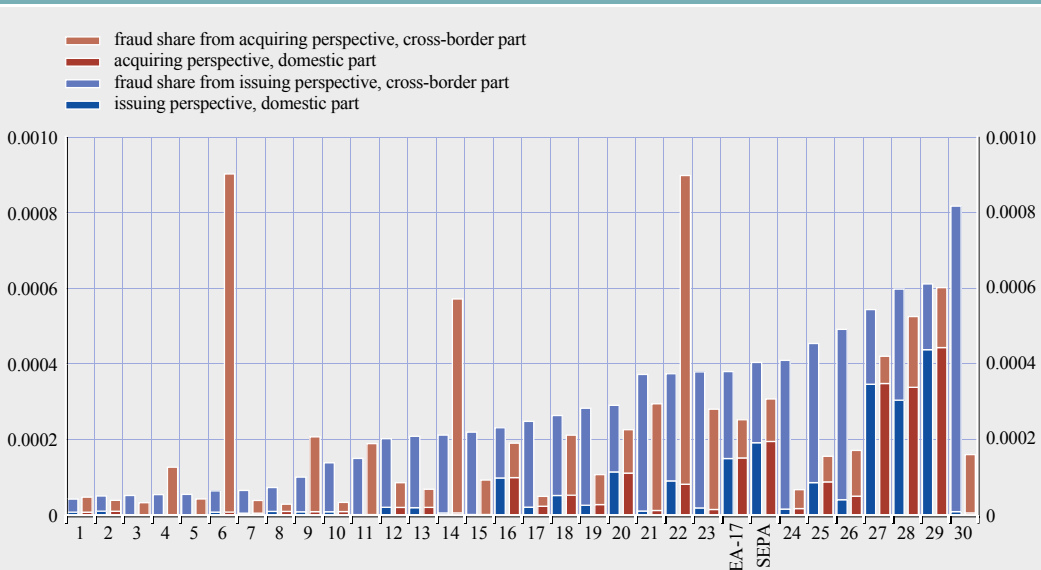
6 A COUNTRY PERSPECTIVE ON CARD FRAUD

Since this collection of data comprises fraud data from SEPA as a whole, it allows fraud levels to be studied per country. Figure 9 reports fraud levels based on 2010 data from an issuing perspective, i.e. fraud related to cards issued within a SEPA country – which includes fraud acquired outside SEPA – and from an acquiring perspective, i.e. fraud related to the country in which the card was (ab)used.¹⁵ Figure 9 shows the relative level of fraud, i.e. the value of fraud divided by the value of transactions for the euro area and SEPA, as well as for selected SEPA countries¹⁶ in anonymous form. From an issuing perspective, the highest fraud losses in relative terms reached 0.061%, while the lowest amounted to 0.004%. In terms of acquiring shares, the highest fraud rate was 0.090% and

15 Please be aware that all figures in this note are based on cards issued inside SEPA. Figures related to cards issued outside SEPA are not included, even if a (fraudulent) payment was acquired inside SEPA. Consequently, the value of fraudulent payments acquired in a country that is indicated is a lower bound of the actual value. Please keep in mind that some variation across countries may result from the different levels of diligence with which fraud is recorded.

16 One country has been excluded, as its domestic transaction data appear to be incomplete.

Figure 9 The value of fraud as a percentage of the total value of transactions using cards issued in a country (blue) and of payments acquired within this country¹⁾ (red)



Source: All CPSs, 2010.

1) Reference numbers for countries differ across the figures presented in this section.

the lowest was 0.003%. The euro area experienced slightly lower fraud levels than SEPA from both an issuing and acquiring perspective.

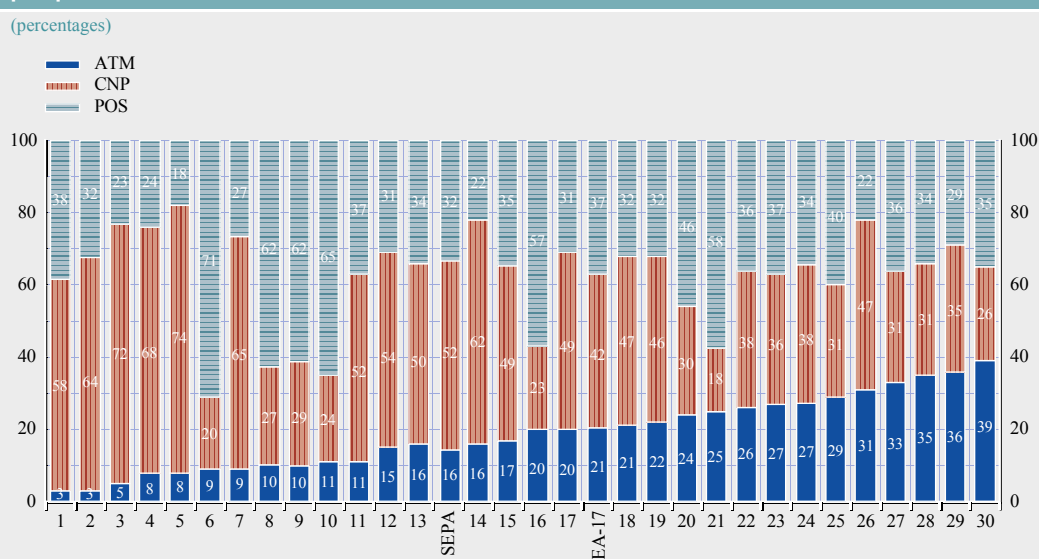
In addition to the value of the fraudulent payments issued and acquired in a country, Figure 9 also indicates the share of domestic fraud (i.e. the value of fraud using cards issued in a country and acquired in the same country) in dark colours. This outlines the fact that some countries still had quite a substantial level of purely domestic fraud (such as countries 27 and 29), while other countries (such as countries 14 and 30) in the main had only cross-border fraud.

Moreover, some countries – such as countries 24 and 30 – suffered losses from an issuing perspective, but were effective in fighting fraud from an acquiring perspective. The low share of domestic fraud in these countries could be an indication that additional monitoring or security features were available domestically while, internationally, the lack of EMV chip cards and the use of magstripes as a fallback solution has led to higher losses. In one country, for instance,

the national CPS has a specific technical feature to prevent domestic fraud, with national cards also being effective for magstripe use. However, this feature does not function across borders. Another useful fraud prevention measure that was reported was the establishment of a common register that allows domestic points of compromise to be identified faster. High levels of cross-border fraud may, however, also result from a high share of cross-border transactions. The share of cross-border transactions (i.e. in a country other than the issuing country) may vary from 2% to 40%.

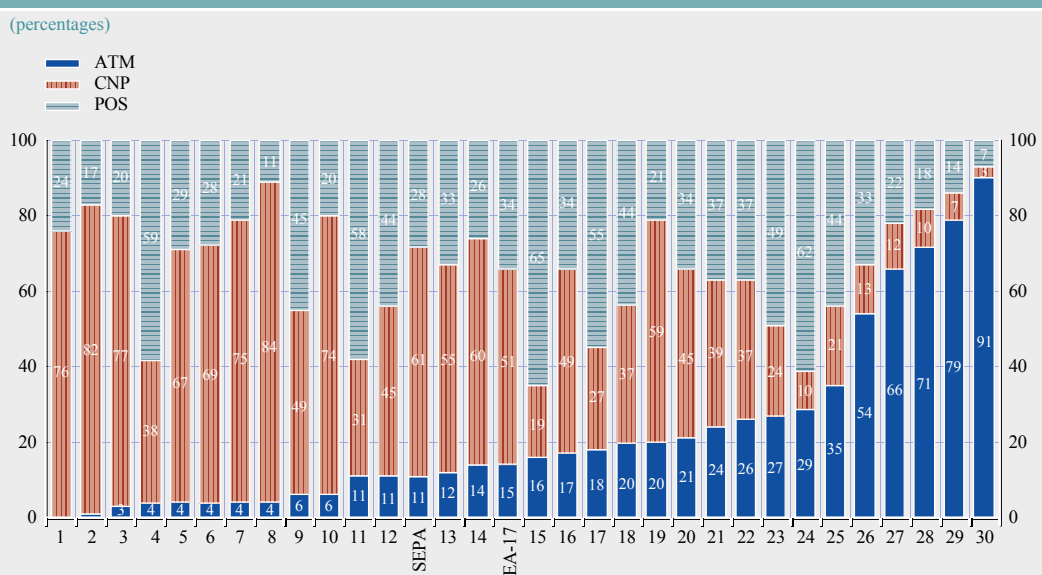
Figure 10 is again based only on an issuing perspective. It illustrates the facts that, in 2010, not only did the level of card fraud vary significantly from one SEPA country to another, but there was also significant variation in the channels for card fraud and, potentially, in card usage in general. Figure 10 indicates the shares of the total value of fraud relating to cards issued in each country that were accounted for by the three transaction channels ATM, CNP and POS. The figures shown in the graph indicate the percentage share of the respective channel and country.

Figure 10 Geographical distribution of the value of card fraud by transaction channel – issuing perspective ¹⁾



Source: All CPSs, 2010.
 1) Owing to rounding, percentages do not always add up to 100%.

Figure 11 Geographical distribution of the value of card fraud by transaction channel – acquiring perspective¹⁾



Source: All CPSs, 2010.

1) Owing to rounding, percentages do not always add up to 100%.

The share of card fraud at ATMs ranged from a mere 3% through to 39%. CNP-related card fraud made up between 18% and 74%, while the lowest share of POS fraud was 18% and the highest was 71%. As pointed out above, CNP fraud accounted for 52% of all fraud issued within SEPA, with POS fraud making up 32% and ATM fraud the remaining 16%. In the euro area, the level of CNP fraud (42%) was only slightly higher than that of POS fraud (37%), while ATM fraud still accounted for 21% of the total value of fraud.

Figure 11 (above) indicates the share of the total value of fraud acquired in SEPA countries through the different transaction channels.¹⁷ A comparison of the issuing and acquiring perspectives illustrates that some countries were targeted to conduct specific types of fraud. For example, fraud acquired in countries 29 and 30 was usually committed at ATMs, whereas fraud acquired in countries 2 and 8 typically involved CNP transactions.

The share of card fraud acquired at ATMs ranged from 0% through to 91%. CNP-related card fraud made up between 3% and 84%.

The lowest share of POS fraud stood at 7% and the highest at 65%. From an acquiring perspective, CNP fraud accounted for 61% of all SEPA fraud, while POS fraud made up 28% and ATM fraud just 11%. The level of CNP fraud in the euro area (51%) was again higher than that of POS fraud (34%), while ATM fraud accounted for 15% of the total value of fraudulent payments acquired in the euro area.

Table 3 gives an overview of general card usage. It shows the number of cards and transactions in relative terms, i.e. on a per card and per inhabitant basis. In 2010 each SEPA inhabitant owned on average 1.4 payment cards and each card was used to make 63 transactions with an associated turnover of around €4,200. There were, however, huge differences between countries: the average Romanian made only 14 card transactions per year, which accounted for payments worth €1,151. By contrast, cards were used more than 200 times a year in Finland, generating average turnover of almost €10,000. In value terms, the highest card usage was reported in the United Kingdom, where each inhabitant generated on

17 Note that this analysis is limited to cards issued within SEPA.

Table 3 Card and transaction levels from an issuing perspective

Country	Cards/ inhabitant	Transactions/ card		Transactions/ inhabitant		Country	Cards/ inhabitant	Transactions/ card		Transactions/ inhabitant	
		Value (€)	Volume	Value (€)	Volume			Value (€)	Volume	Value (€)	Volume
AT	1.3	3,259	44	4,181	56	IT	1.2	3,503	30	4,057	35
BE	1.8	5,455	75	9,748	135	LT	1.3	1,926	38	2,502	49
BG	1.0	1,097	17	1,109	17	LU	2.6	4,496	51	11,891	134
CY	1.7	3,671	35	6,271	60	LV	1.1	2,584	59	2,801	64
CZ	0.9	3,291	40	2,967	36	MT	1.6	2,967	35	4,861	57
DE	1.6	3,870	38	6,037	59	NL	1.8	5,027	92	9,145	167
DK	1.3	6,173	129	8,304	174	PL	0.8	2,726	48	2,283	40
EE	1.3	3,189	118	4,271	158	PT	1.9	4,304	83	7,968	153
ES	1.6	2,863	44	4,449	68	RO	0.6	1,957	24	1,151	14
FI	1.4	7,074	167	9,675	228	SE	2.2	3,801	94	8,184	201
FR	1.3	5,797	106	7,586	139	SI	1.7	2,695	49	4,661	86
GB	2.4	5,093	79	12,024	186	SK	0.9	2,696	34	2,533	32
GR	1.3	3,801	18	4,780	23	EA-17	1.4	4,225	59	6,058	85
HU	0.9	2,940	37	2,626	33	SEPA	1.4	4,224	63	5,966	88
IE	1.3	8,178	89	10,257	112						

Source: Statistical Data Warehouse.

average a turnover of more than €12,000. The coefficient of variation is markedly smaller when considering transactions in relation to the number of cards issued. The number of transactions per card ranged from 17 in Bulgaria to 167 in Finland, while the corresponding values ranged from 1,097 in Bulgaria to 8,178 in Ireland. Similar discrepancies can be found when looking at fraud rates. In aggregated terms, 0.018% of all transactions in SEPA and 0.040% of the total transaction value were fraudulent. This translates

into 11.6 fraudulent transactions and more than €1,700 of losses for every 1,000 cards issued, or 16.3 cases of fraud and more than €2,400 of losses per 1,000 SEPA inhabitants.

According to data from the EPC, more than 80%¹⁸ of all SEPA cards had an EMV chip at the end of 2010 (see Table 4). Within individual countries,

¹⁸ Here, the EU reference level is used as a proxy for the corresponding SEPA level.

Table 4 EMV migration levels

(percentages)							
Country	Cards	ATMs	POS terminals	Country	Cards	ATMs	POS terminals
AT	100.00	99.05	85.10	IT	69.78	80.00	81.00
BE	100.00	92.70	96.00	LT	82.09	39.00	45.00
BG	2.26	93.21	42.68	LU	100.00	100.00	100.00
CY	90.74	63.50	82.00	LV	91.45	52.21	88.55
CZ	94.05	100.00	99.93	MT	93.68	57.10	100.00
DE	93.29	96.00	85.00	NL	94.37	100.00	79.62
DK	92.11	100.00	100.00	PL	0.05	44.00	80.00
EE	89.76	100.00	92.54	PT	83.79	100.00	94.17
ES	48.70	99.62	91.40	RO	57.96	98.31	88.77
FI	93.06	100.00	70.00	SE	93.91	100.00	71.40
FR	100.00	100.00	99.50	SI	97.92	94.39	95.75
GB	100.00	100.00	100.00	SK	86.93	100.00	98.55
GR	58.23	99.88	70.59	EA-17	82.23	95.38	88.29
HU	38.26	97.00	91.00	SEPA	80.96	96.10	89.55
IE	99.99	100.00	99.99				

Source: EMV migration.
Note: ECB figures based on EPC data; Q4 2010.

implementation ranged from less than 1% in one country to full implementation in several others. These differences were weaker when looking at EMV migration at ATMs and POS terminals.

7 CONCLUSIONS

This report shows that levels of fraud were lower in the euro area than in SEPA as a whole. Furthermore, an analysis of payment flows within and across SEPA demonstrates that card fraud is an international organised activity, necessitating cooperative fraud prevention measures and international standards, such as EMV, or strong authentication in combination with 3-D Secure.

The internationalisation of the card business is also reflected in the finding that cross-border transactions within SEPA grew much faster than domestic transactions.

This report shows that the total value of card fraud within SEPA declined markedly from 2009 to 2010. Although the absolute level of fraud was higher in 2010 than back in 2007 when the joint and harmonised collection of data at the European level was introduced, the relative level of fraud declined over the whole period. In 2010 the share of transactions that were fraudulent accounted for 0.040% of the total transaction value.

When analysing counterfeit fraud at ATMs and POS terminals, it can be assumed that migration to the EMV standard has contributed to a decline in the level of counterfeit card fraud acquired in SEPA countries. Since migration levels inside SEPA are approaching full coverage, the findings confirm that further fraud prevention measures may need to be considered in order to prevent losses from payment fraud acquired outside SEPA. If magstripe usage cannot be completely avoided, joint measures should be considered which aim to quickly identify points of compromise and to communicate these to card issuers as a precondition for card blocking.

In 2010 CNP payments accounted for around half of the total value of fraud, with fraud at POS terminals making up around a third and fraud at ATMs roughly a sixth of the total value of fraud.

This confirms what regulators, legislators, payment service providers and the general public are currently finding, namely that payments made over the internet experience higher rates of fraud than traditional payment methods. Thus, in 2011 the European Forum on the Security of Retail Payments, on which the relevant public authorities cooperate voluntarily – especially those overseeing and supervising payment service providers – focused its work on developing recommendations to improve the security of internet payments. These recommendations were issued for public consultation on the ECB website on 20 April 2012.

No obvious patterns could be found when looking at fraud shares across SEPA countries. Investigating the determinants of card fraud in more detail would therefore be an interesting endeavour, but it would also require further details than are currently available.

